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Do serial entrepreneurs run successively better-performing businesses?

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ABSTRACT

This paper investigates whether – consistent with theories of entrepreneurial learning by doing and resource acquisition – serial entrepreneurs' performance follows a rising trajectory over successive venturing spells. Or whether – consistent with theories of selective learning from failure and hubris – serial entrepreneurs perform better after experiencing a bad spell (and worse after experiencing a good spell). We test competing hypotheses about serial entrepreneurs' performance trajectories using Panel Study of Income Dynamics (PSID) data, which track the dynamic performance of a sample of American serial entrepreneurs for up to one-quarter of a century. The findings show that serial entrepreneurs obtain temporary benefits from spells of venturing which eventually die away. This implies that venturing generates benefits which spill over from one venture into subsequent ones, and it can provide a rationale for public policies which encourage re-entries by entrepreneurs, even if those entrepreneurs performed poorly in their first ventures.

1. Executive summary

There are two popular but mutually inconsistent conjectures about the dynamic performance of serial entrepreneurs. According to the first conjecture, which is informed by theories of entrepreneurial learning by doing and resource acquisition, serial entrepreneurs run ever more successful businesses over time. The second conjecture, which is informed by theories of selective learning from failure and hubris, asserts in contrast that serial entrepreneurs tend to be galvanized by poor performance, but fall into complacency traps if they become accustomed to success. Whereas the first conjecture implies that the temporal profile (or trajectory) of serial entrepreneurs' performance rises steadily over successive ventures, the second conjecture implies a cyclical performance trajectory. To date, research has not revealed which, if any, of these conjectures most closely accords with reality. The contribution of this paper is to explore whether serial entrepreneurs benefit more from successful or unsuccessful prior venturing spells — and more generally to reveal the performance trajectories of serial entrepreneurs' over successive ventures.

Why do we know so little about the performance trajectories of serial entrepreneurs? One possible explanation is that previous research has tended to rely on cross-section data which contain detailed information about only one of a series of businesses. The present paper attempts to extend our knowledge on this topic by exploiting a detailed and extensive longitudinal dataset, the US Panel Study of Income Dynamics (PSID), which inter alia contains data on multiple sequential ventures operated by the same individuals. Our paper exploits these data to provide an empirical analysis of the performance trajectories of serial entrepreneurs. We frame the range of different possible trajectories as a set of competing hypotheses. These hypotheses include not only the two mentioned above, but also a third hypothesis predicting temporary positive benefits from learning (consistent with theories of human capital depreciation) and a fourth predicting a flat trajectory. The competing hypotheses are nested within a general econometric specification of a first-order linear (performance) difference equation, which is estimated using dynamic panel data methods in order to identify which trajectory is most consistent with the data. We find that serial entrepreneurs' performance trajectories exhibit mean reversion: although good performance in one venture appears to be associated with good performance in

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subsequent ventures, these positive effects are nearly completely exhausted by the end of the next spell. These findings are consistent with the notion that benefits from venturing are temporary, and depreciate over time.

Our analysis and research findings carry several implications for entrepreneurship research and practice. First, a range of stakeholders, including lenders, are interested in discovering the likely risks and returns from participating in a serial entrepreneur's new venture. Performance trajectories may contain valuable information in this regard. For example, if performance tends to improve over successive ventures, banks might anticipate a greater prospect of seeing a return on their investments, and so become more willing to lend to serial entrepreneurs. The opposite might apply if performance tends to deteriorate over successive ventures. Second, entrepreneurs are known to be prone to over-optimism and other cognitive biases, which can cause them to experience poor performance in their initial ventures. This has prompted some experts to advocate tough bankruptcy laws, to discourage entrepreneurial “over-investment”. However, this recommendation implicitly assumes that entrepreneurs would do no better in subsequent ventures were they to re-enter. If serial performance trajectories predict improvements in the performance of subsequent ventures, gentler bankruptcy laws may be warranted. Hence appropriate public policies towards serial entrepreneurship may depend in part on what serials' performance trajectories actually are. Third, the prospect of a rising performance trajectory could induce risk-averse entrepreneurs to brave the hazards of start-up and make entry more attractive than if performance outcomes in successive ventures are unrelated. That realization could have a profound effect on initial entry decisions. For all these reasons, it is desirable to understand more about performance trajectories of serial entrepreneurs.

2. Introduction

Ever since MacMillan (1986) highlighted the centrality of serial entrepreneurs for understanding entrepreneurship, researchers have directed increasing attention to this important group. Several major contributions by Ucbasaran et al. (2003, 2006, 2008), Westhead and Wright (1998), Westhead et al. (2003, 2005), and Wright et al. (1997) have improved our understanding of issues as diverse as behaviors and opportunity recognition by serial entrepreneurs, and characteristics that distinguish serial entrepreneurs from both one-time (“novice”) entrepreneurs, and “portfolio” entrepreneurs who run several businesses concurrently. Theoretical and empirical research has also analyzed the entry and re-entry decisions of serial entrepreneurs (Amaral et al., 2011; Plehn-Dujowich, 2010; Stam et al., 2008), as well as their performance (Alsos et al., 2006; Gompers et al., 2010; Westhead et al., 2003, 2005). While these studies have certainly enhanced our knowledge about these aspects of serial entrepreneurship, it remains the case that relatively little is known about how serial entrepreneurs' performance in one venture is related to their performance in a subsequent venture they found. The profile of a serial entrepreneur's performance over successive ventures is termed a “trajectory” in this paper.

Much of what we know about serial entrepreneurship comes from cross-section studies of entrepreneurs which often focus on the entrepreneur's current or most recent business (Ucbasaran et al., 2006). Analyses of the performance of serial entrepreneurs therefore embody something of a static character, which has nevertheless facilitated interesting comparisons with other types of entrepreneurs, including novice and portfolio entrepreneurs (Westhead and Wright, 1998; Wright et al., 1997). Yet it is becoming increasingly widely recognized that we need to move beyond simple snapshots of serial entrepreneurs and to look instead at the dynamics of their venturing spells in general and their venture performance trajectories in particular. This promises to bring new questions into the purview of the researcher, including whether entrepreneurs' performance tends to improve when they try venturing again, perhaps because they learn from experience (Minniti and Bygrave, 2001; Parker, 2006) or acquire valuable resources in the course of the venturing process (Davidsson and Honig, 2003). There are several popular, but incompatible, anecdotal conjectures about the trajectories of serial entrepreneurs' performance over successive ventures, including an ever-rising trajectory as entrepreneurs perform “learning by doing” (Argote, 1999; Audia et al., 2000) and a “cycling” trajectory whereby serial entrepreneurs learn from and improve after failure, but fall into complacency traps and under-perform after they succeed (Entrepreneurship Magazine, 2009; Hayward et al., 2006; March, 1991; Simon et al., 2000). At present, we lack hard evidence, based on a large representative sample, about which trajectory best describes reality. The aim of the present paper is to fill this gap in the literature.

The paper starts by formally characterizing different possible performance trajectories of serial entrepreneurs, including those corresponding to the two popular conjectures noted above. We draw on previous theoretical literature – relating to learning by doing and selective learning from failure; human capital accumulation and resource acquisition; and hubris – to formulate a set of competing hypotheses about performance trajectories. We adopt a competing hypotheses framework because this is deemed an appropriate approach when prior knowledge gives rise to multiple reasonable explanations of a phenomenon (Armstrong et al., 2001), as is the case here. These hypotheses are then tested against each other using a sample of data taken from the US Panel Study of Income Dynamics (PSID). The PSID is a large representative panel survey which allows the researcher to follow serial entrepreneurs over several ventures for up to one quarter of a century. We then go on to estimate a dynamic panel data model of the performance trajectories of serial entrepreneurs across distinct businesses, to identify which trajectory is most consistent with the data.

This paper adds to previous research on the performance of serial entrepreneurs by extending the empirical analysis of serial entrepreneurship into a dynamic domain (Gompers et al., 2010). It does so by characterizing different serial performance trajectories, before estimating them using a sample of longitudinal data. We then draw out several implications of our results, which might interest a range of stakeholders, including lenders. For instance, information about serial entrepreneurs' performance trajectories could enable lenders to make better predictions of the profitability of new ventures proposed by serial entrepreneurs (Gompers et al., 2010; Ucbasaran et al., 2008; Wright et al., 1997). Lenders would presumably be more willing to fund the next venture of a serial entrepreneur if they believe that serial performance trajectories tend to rise rather than fall over successive ventures.

Table 1
Performance trajectories.

Performance trajectory	Hypothesis and rationale	Empirical support
T1: $\gamma \geq 1$. Ever-rising trajectory: performance keeps improving over successive ventures	Hypothesis 1a: learning and resource acquisition	No
T2: $-1 \leq \gamma \leq 0$. Cycling trajectory: good performance in one venture is followed by poor performance in the next — and vice-versa	Hypothesis 1b: hubris and competency traps follow good performance while mindful reassessment follows poor performance	No
T3: $0 < \gamma < 1$. Mean-reverting trajectory: performance can be initially above- or below-average but eventually reverts to the entrepreneur's idiosyncratic mean	Hypothesis 1c: benefits of learning and resource acquisition mitigated by knowledge depreciation	Yes
T4: $\gamma = 0$. Flat trajectory: performance does not vary systematically over successive ventures	Hypothesis 0: learning ineffective or difficult	No

Abundant literature has shown that entrepreneurs are prone to over-optimism (Busenitz and Barney, 1997; Cooper et al., 1988; Hayward et al., 2010). That can lead entrepreneurs to: invest precipitately (Hayward et al., 2006); disproportionately enter hyper-competitive industries (Moore et al., 2007); and expand output aggressively thereby driving market prices below production costs (de Meza and Southey, 1996). As a consequence, many entrepreneurs experience poor performance in their initial ventures (Landier and Thesmar, 2009). This has prompted some experts to advocate tough bankruptcy laws, to discourage entrepreneurial "over-investment" (Coelho et al., 2004; de Meza, 2002; de Meza and Southey, 1996). However, if serial entrepreneurs learn from their venturing experiences and/or acquire valuable resources from them, they could perform better on average in their second than in their first ventures. In which case, over-optimism may diminish over time (Ucbasaran et al., 2010), suggesting different public policy recommendations, including possibly laxer bankruptcy laws (Lee et al., 2011). More generally, perspectives on the desirability of business survival, as well as private and public sector efforts designed to promote it (Pe'er and Vertinsky, 2008), might be informed by research which sheds light on the performance trajectories of serial entrepreneurs.

It is worth pointing out that the prospect of a positive performance trajectory could induce risk-averse entrepreneurs (Caliendo et al., 2010; Fossen, 2012; Parker, 1997) to brave the hazards of start-up and make entry more attractive than if performance in successive ventures is unrelated. That realization, which has not been fully explored in previous research, could have a profound effect on initial entry decisions. As such, it complements prior research which has identified an option value for entrepreneurs emanating from the collapse of business ventures (McGrath, 1999). In the present study, the option value comes from benefits which spill over from one spell of venturing to subsequent spells.

This article has the following layout. The next section discusses different possible performance trajectories and proposes a set of competing hypotheses based on arguments drawn from previous research on learning by doing and selective learning from failure; human capital accumulation and resource acquisition; and hubris. This is followed by a description of the data, variables and empirical methods used in the study. Finally, the results are presented and their implications are discussed.

3. Performance trajectories

This section first defines precisely what is meant by a "performance trajectory", and introduces a simple dynamic equation which encompasses a variety of different trajectories. These trajectories are also summarized verbally in Table 1. We then outline a set of competing hypotheses consistent with different performance trajectories nested within the dynamic equation. These include the two popular conjectures about serial entrepreneur's performance trajectories noted at the start of this article. We then go on to consider two additional trajectories as well. One of them is based on the notion of knowledge depreciation; the other one is flat over successive venturing spells.

3.1. A framework to encompass different performance trajectories

Fig. 1 illustrates several possible trajectories of financial performance, Π_s, over successive venturing spells, s. Each venturing spell corresponds to a distinct venture. A *performance trajectory* is a line plotting performance Π_s against s. The trajectories illustrated in Fig. 1 are generated by different values of the parameter γ in the equation

$$\Pi_s = \alpha + \gamma \Pi_{s-1} \quad s = 2, 3, \ldots \tag{1}$$

Here α is a constant, which (if $|\gamma| < 1$) can be interpreted as the mean (long run) performance for a given entrepreneur. Fig. 1 illustrates, and Table 1 describes, various trajectories given the initial performance values Π_1. The salient cases are[1]:

T1 $\gamma \geq 1$. In this case, performance rises steadily and rapidly over successive ventures.[2]

[1] A further trajectory, corresponding to $\gamma < -1$, yields exploding cycles. This case can be ruled out on both theoretical and empirical grounds, since we would never expect to see (and nor do we observe) spectacular entrepreneurial over-performance followed by even more spectacular under-performance, which is then followed by even more spectacular over-performance, ad infinitum.

[2] When $\alpha = 0$, this case occurs only for $\gamma > 1$.

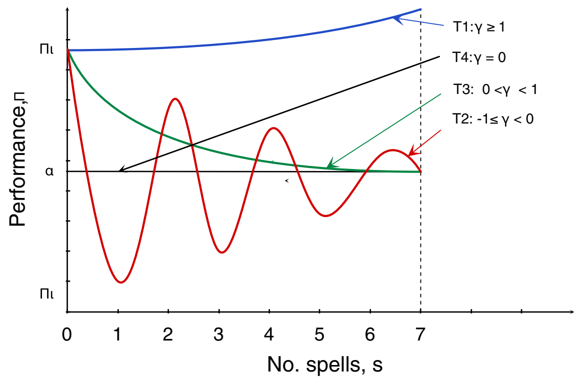

Fig. 1. Performance trajectories.

T2 $-1 \le \gamma < 0$. In this case, "good" (i.e. above-mean) performance is followed by "bad" (i.e. below mean) performance and vice-versa; performance cycles around α.
T3 $0 < \gamma < 1$. In this case, performance remains above (if $\Pi_1 > \alpha$) or below (if $\Pi_1 < \alpha$) the mean α over successive ventures, but eventually converges towards it.[3]
T4 $\gamma = 0$. In this case, performance is flat, taking the value α in all ventures.

Trajectory T1 represents one popular view of serial entrepreneurial performance, which is taken to improve progressively over successive ventures. Trajectory T2 in contrast represents the alternative popular view, in which good performance follows bad performance and vice-versa. The remainder of this section states a set of competing hypotheses which gives rise to each of T1 through T4.

3.2. Competing hypotheses about serial entrepreneurs' performance trajectories

First consider T4: flat trajectories. This possibility can arise for at least three reasons. First, entrepreneurs simply might not derive any durable benefits from their venturing experience. For instance, there may be little to learn if entrepreneurs' ventures are simple and/or similar to their previous ones (Weick et al., 1999). Alternatively, experience may be a poor teacher if spells in entrepreneurship yield only small and ambiguous samples of data (Lampel et al., 2009; March et al., 1991).

A second reason for flat trajectories is grounded in cognitive limitations which constrain entrepreneurs' abilities to learn. Learning is intrinsically difficult, even for smart people (Levinthal and March, 1993). This consideration may be especially relevant in the case of serial entrepreneurs, since the deep causes of venture performance, especially under-performance, are often heterogeneous and hard to unravel (Haunschild and Sullivan, 2002). Third, learning can also be hampered by the inappropriate use by entrepreneurs of cognitive heuristics which can engender cognitive and behavioral ruts (Rerup, 2005). Overconfidence (Cooper et al., 1988; Vancouver et al., 2002) may only serve to restrict learning further. Hence we propose as an initial "null hypothesis":

Hypothesis 0. The trajectory of serial entrepreneurs' performances over successive ventures is flat (i.e. follows T4).

Yet other scholars have argued that entrepreneurial learning helps entrepreneurs develop their skills and knowledge, and so enhances their future performance (Cope, 2005; Rae and Carswell, 2000). Entrepreneurs receive feedback from the market as they set up and establish their ventures (Jovanovic, 1982; Minniti and Bygrave, 2001; Parker, 2006). Their ability to reflect and act upon this feedback determines how much learning they perform (Alvarez and Parker, 2009; Nystrom and Starbuck, 1984). Entrepreneurs learn how to: recognize new venture opportunities (Alsos et al., 2006; Baron and Ensley, 2006; Ucbasaran et al., 2009); spot effective managerial practices; and develop reputations and network relationships with suppliers and financiers (Cope, 2011; Gompers et al., 2010; Politis, 2005, 2008; Stuart and Abetti, 1990; Westhead et al., 2005; Wright et al., 1997). Learning can also strengthen entrepreneurs' abilities to process and respond to complex information, for example by matching information to appropriate actions (Lord and Maher, 1990); stimulating creativity (Amabile, 1997); and generating fast and effective heuristics (Ucbasaran et al., 2008).

Of course, learning that augments personal knowledge and skills is not the only reason why performance improvements gained in one venture may spill over into future ones. Entrepreneurs can also derive long-term benefits from other resources acquired during the venturing process, including social, human and financial capital (Davidsson and Honig, 2003; Gompers et al., 2010). In general, performance in one venture can provide resources for future ventures, especially if performance is associated with success (Hayward et al., 2010). Human capital, social capital and financial capital are all valuable, rare, inimitable and

[3] An exception to this outcome occurs in a special case where $0 < \gamma = 1 - (\alpha/\Pi_1) < 1$. Then $\Pi_2 = \Pi_1$, i.e. the performance trajectory is flat. An anonymous reviewer has suggested an interpretation for this whereby benefits from past performance are exactly offset by depreciation of those benefits.

non-substitutable resources which, according to the resource-based view, are associated with superior venture performance (Barney, 1991).

An important issue here is the *durability* of performance-related benefits in serial entrepreneurship. To the extent that they are durable, benefits which increase performance in one venture are likely to enhance performance in future ventures as well. For example, if entrepreneurs retain and accumulate successful practices acquired through learning (Cope, 2011; March, 1991; Sitkin, 1992) one might expect to observe trajectory T1: ever-increasing performance over successive ventures.

Hypothesis 1a. The trajectory of serial entrepreneurs' performances over successive ventures is steadily and monotonically increasing (i.e. follows T1).

Trajectory T2 is associated with the second popular view, which states that entrepreneurs under-perform before over-performing (McGrath, 1999; Politis, 2008; Sitkin, 1992) — while at the same time over-performance contains the seeds of future under-performance (March, 1991; Rerup, 2005). Together, these differential responses to high and low performances imply a "cycling" pattern of over-performance followed by under-performance, which in turn is followed by over-performance, etc. — see T2 in Fig. 1. These can be stable cycles, $\gamma = -1$: individuals never learn that they over-react to high and low performances. If in contrast individuals over-react but become aware that they are over-reacting, then $\gamma > -1$: cycles moderate and eventually disappear as individual awareness of over-reactions becomes complete.

The arguments supporting cycling trajectories rest on two key assumptions. First, the external market environment is assumed to change in ways that make strategies and behaviors used in previous ventures ineffective or even harmful when applied to new ventures, resulting in costly errors (Wright et al., 1997). Second, entrepreneurs are supposed to understand and correct these errors after they perform badly, but *not* after they perform well. That is, after under-performing, entrepreneurs are assumed to mindfully reassess their mental models and behaviors, leading them to abandon ineffective routines, and implement more appropriate strategies (Kim et al., 2009; Rerup, 2005; Shepherd et al., 2009). Under-performance serves as an instrument to learn "what works and doesn't work" (Sarasvathy and Menon, 2002: 9) and to build resilience for future venturing efforts (Hayward et al., 2010). But after they perform well, in contrast, entrepreneurs are assumed to behave very differently, being prey to "competency traps" (March, 1991) or "hubris" (Hayward et al., 2006; Simon et al., 2000). Entrepreneurs stuck in competency traps feel no need to modify their outlook and erroneously persist with strategies which have lost their relevance. Likewise, hubris implies that success in one venture can lead entrepreneurs to place too much faith in their prior actions and to over-estimate their abilities (Sitkin, 1992). They can then end up doing too little learning and possibly taking excessive risks, leading to poor performance in subsequent ventures (Hayward et al., 2006; Vancouver et al., 2002). We summarize these arguments in a second, competing hypothesis:

Hypothesis 1b. The trajectory of serial entrepreneurs' performances over successive ventures exhibits a cycling pattern (i.e. follows T2).

While it cannot be denied that entrepreneurs sometimes fall into competency traps and are subject to hubris, the second assumption supporting the cycling trajectory seems questionable for at least two reasons. First, in contrast to the assumption that entrepreneurs only learn effectively after they have under-performed and rebound to achieve superior performance, several strands of the entrepreneurship literature suggest that the after-effects of poor venture performance might be negative rather than positive. Under-performance can reduce favorable affective states (Hayward et al., 2010; Shepherd, 2003) and engender a social stigma, retarding access to capital (Cardon et al., 2011; Landier, 2006). These outcomes can interfere with serial entrepreneurs' ability to learn from adverse events (Baurnard and Starbuck, 2005; Cope, 2011). For instance, to protect themselves from damaged self-esteem, entrepreneurs may attribute poor performance to external causes (Parker, 2009b; Zuckerman, 1979). The danger then is that they do not learn at all, resulting in under-performance which is perpetuated across ventures. These reasons suggest that bad rather than good performance will likely follow an unsuccessful venture spell. But this is inconsistent with a cycling performance trajectory.

Second, the arguments underpinning the cycling trajectory assume that serial entrepreneurs are selective learners, drawing correct lessons from bad experiences but not from good ones. Yet evidence from the psychology literature suggests that individuals, while possessing heterogeneous cognitive and learning abilities (Hunter, 1986; Schmidt and Hunter, 2004) exhibit relatively stable patterns of learning over time (Murphy, 1989; Salthouse, 2011). In particular, individuals' learning abilities are shaped less by transient performance outcomes than by innate and deep-rooted factors such as age and socio-economic status (Fozard and Nuttall, 1971). Adapted to the case of entrepreneurship, this implies that serial entrepreneurs with limited learning abilities are likely to follow one spell of poor performance with another spell of poor performance, while serial entrepreneurs with high learning abilities are likely to follow one spell of good performance with another spell of good performance. But again, this is inconsistent with a cycling performance trajectory.

It is also possible to take issue with an important assumption underlying the steadily and monotonically increasing performance trajectory — namely that, once acquired, resources remain available and applicable to entrepreneurs indefinitely. Instead, it may seem more plausible that skills and knowledge depreciate over time. The reason for believing that depreciation might be relevant comes from a well-established literature on this issue in labor economics. Thus, Mincer and Ofek (1982) famously established that interrupted work careers among American women entail substantial wage reductions upon their re-entry to the labor market — implying depreciation in their human capital stocks. A substantial body of subsequent research has confirmed that human capital depreciates with time spent away from the workplace (e.g. Albrecht et al., 1999; Neuman and

Weiss, 1995). And research in psychology has established that the interruption of tasks is associated with forgetting, leading to worse performance later on (Argote et al., 1990).

We believe that an analogous state of affairs is likely to hold in the context of serial entrepreneurship. If so, knowledge and skills acquired in one venture, while remaining of some value, gradually become less applicable as circumstances change. That is, only a fraction of the human capital acquired in one venture may remain applicable in subsequent ones. Furthermore, learning opportunities and social capital (e.g. networks and relationships) can be lost when the parties involved in a venture are disbanded (Rerup, 2005). This type of depreciation may be especially pertinent in a research design such as the one adopted in this paper, where serial entrepreneurship is operationalized as discrete spells of venturing with gaps between them. These arguments all suggest that venturing has positive but temporary effects on future performance which die away over time — consistent with a positive but depreciating trajectory (T3) rather than a steadily increasing (T1) or cycling (T2) trajectory.[4] Hence we propose the final competing hypothesis:

Hypothesis 1c. The trajectory of serial entrepreneurs' performances over successive ventures involves positive benefits which depreciate over time (i.e. follows T3).

4. Data and methods

4.1. Data

The data sample is drawn from the US Panel Study of Income Dynamics (PSID), the longest-running longitudinal survey in the world. The PSID comprises a representative sample of American families. For every year since 1968 (and every two years since 1997), the PSID has contacted between 4800 and over 7000 families, interviewing and re-interviewing respondents whether or not they were living in the same dwelling or with the same people. Data are compiled for the primary adults (males in 93% of cases) heading the family unit, known as “household heads”: the data analysis below focuses on this group. Weights are available (and were used in the analysis below) to ensure that the sample is nationally representative.

The PSID collects detailed data on incomes, sources of incomes, employment, work hours and family structure, and a host of socio-demographic variables. Importantly for the analysis that follows, the PSID contains detailed information about financial performance, employment status and industry codes in every year over 1968–92. Unfortunately, income responses are only collected biennially after 1992, so our sample period runs over 1968–92. Hence the sample is somewhat dated, and may not accurately reflect current venturing opportunities — for example if labor force participation patterns have changed, and technological progress has rendered the exploitation of opportunities easier over time.

It should be acknowledged straightaway that the PSID data were not collected with the intention of analyzing entrepreneurship. Primarily, the dataset is used to analyze economic, health and social issues in the United States; many studies have used it to study the aspects of labor markets. Hence the dataset is very limited in the number of entrepreneurship constructs it contains. For instance, it has little or no data on psychological or cognitive attributes; the process of entrepreneurship; reasons for firm closure; or firm or product information. It also lacks data on sources of venture finance, including venture capital; and it under-samples the very wealthiest entrepreneurs (Hurst and Lusardi, 2004). This imposes some limits on the richness of the analysis we can conduct, as well as the generalizability of our findings. On the other hand, the PSID has the key advantage of containing a long span of longitudinal data, including unrivaled information about incomes measured on a consistent and non-retrospective basis. Indeed, the data are extensive enough to include many serial entrepreneurs with long gaps between spells. In contrast, most previous studies of serial entrepreneurship have relied on special cross-section “one-off” samples, which limit the kind of dynamic analysis of interest here (Ucbasaran et al., 2008).

To focus our attention on active adult entrepreneurs, the sample was restricted to household heads over 21 years of age, who worked a positive number of hours. There were 8484 such cases. Following the classification of Ucbasaran et al. (2008, Table 7.1), the empirical analysis focuses on a particular class of serial entrepreneurs, referred to as “serial self-employed”. Ucbasaran et al. (2008) identify serial self-employment as a particular category of serial entrepreneurship. Unlike the other categories of serial entrepreneurship they identify (namely serial founders, serial spin-out entrepreneurs, serial acquirers and serial corporate entrepreneurs), serial self-employment matches closely the theoretical discussion that follows as well as the sample data to hand. Self-employment corresponds to the Knightian concept of risk-taking and profit-seeking activity (Kihlstrom and Laffont, 1979). It has been extensively used in prior research on novice (Parker, 2009a) and serial entrepreneurship (e.g. Flores-Romero, 2006). It is closely related to the concept of business ownership — a long-standing entrepreneurial construct (Hawley, 1907) which also happens to be a commonly used measure in the empirical habitual entrepreneurship literature (Ucbasaran et al., 2008).[5]

[4] Fig. 1 illustrates the case of T3 with $\Pi_1 > \alpha$. Note that if $\Pi_1 < \alpha$, then positive benefits in this case lift performance in future spells; but these benefits decay too fast for performance to reach α immediately. Hence performance converges gradually to α from below in this case.

[5] Self-employment status and incomes are observed in the PSID on a consistent and continuous basis over 1968–92. In contrast, data on the alternative definition of business ownership are not available in all years in the PSID and are framed at the family rather than the individual level — thereby including businesses run by other family members (who may, moreover, have only a passive investment interest). According to a one-off question about individual business ownership in 1993, over one-eighth of recorded family businesses are *not* owned by the household head. For all these reasons business ownership data were felt to be unsuitable for analyzing serial entrepreneurship.

In this study, a venturing spell (hereafter, simply "spell") is defined as a continuous period during which the respondent declared themselves to be engaged in self-employment and no other form of income-generating activity. A spell is broken when a respondent switches into partial or full paid employment, unemployment, inactivity or retirement: each spell is associated with exactly one entrepreneurial event.[6] Spells were identified after hand-constructing full observed work histories for every case in the sample. The PSID does not contain information about why entrepreneurs terminate spells, though prior research suggests that most terminations are voluntary quits rather than involuntary bankruptcies (Bates, 2005; Taylor, 1999). The focus of the analysis below is on performance of successive ventures irrespective of the reasons for venture closures.

The full sample, which includes members of incorporated and unincorporated businesses, comprises 707 entrepreneurs. Of these, 226 had two or more spells, while 86 had three or more spells in entrepreneurship. Hence serial entrepreneurs constitute a minority of entrepreneurs, who are themselves a minority of the working population. Yet we have good reasons to believe that their economic impact is disproportionate to their number (MacMillan, 1986).

Table 2 lists the frequencies of different numbers of spells as well as the average length of spells, measured in years. Table 2 shows that the distribution of the number of spells is heavily skewed with a mode of one, indicating that serials constitute the minority of entrepreneurs. The proportion of entrepreneurs with two or more spells is 32%, which is broadly in line with other studies (e.g. Westhead and Wright, 1998). The proportion with three or more spells is lower, at 12%. Table 2 also shows that the average length of spells shortens the more spells an entrepreneur has, which is perhaps not surprising given the fixed length of the panel.

To shed further light on the composition of the sample, data on whether respondents were unemployed just prior to their most recent venturing spell can be used to explore whether the serial entrepreneurs in the sample are predominantly "necessity" entrepreneurs. If they are, there should be a significant positive relationship between prior unemployment and the tendency to be a serial entrepreneur. In fact, in estimations of a simple probit model of serial entrepreneurial status, the unemployment variable entered with a coefficient which was *negative* and insignificant ($\beta = -0.23$, *st. err.* $= 0.15$, $p = 0.12$). This suggests that the sample is not dominated by necessity entrepreneurs.

The unit of analysis in this study is individual entrepreneurial spells. Note that the earlier theoretical analysis referred to performance trajectories defined over multiple spells. In this context, two spells are probably too few to be consistent with the notion of performance trajectories, while Table 2 suggests that spell numbers in excess of three cut down the sample too stringently. *Hence the primary empirical analysis below is restricted to serial entrepreneurs who have reported experiencing three or more distinct spells of self-employment*. As Ucbasaran et al. (2008, 416) argue, focusing on serial entrepreneurs with three or more spells has the additional advantage of removing exceptionally "lucky" or "noisy" cases from the analysis. In fact, checks of the data showed that serial entrepreneurs with three or more venturing spells do not differ significantly in terms of their individual characteristics from serial entrepreneurs with only two spells. For example, none of the age, education, family size, house prices, profits, part-time status or previous unemployment experience differs significantly between these two groups.

4.2. Measures

4.2.1. Dependent and lagged dependent variables

Financial performance in a spell of serial entrepreneurship, Π_s, is measured as the logarithm of hourly business profits averaged over that spell. In each year, profits are defined in the PSID as the labor part of the household head's total business and farm income from the previous year. The consumer price index (CPI) was then used to express these incomes in constant 1985 dollars. After matching income data to the previous year's observations, total profits were measured in every year of each spell before being divided by the entrepreneur's (self-reported) total annual work hours. Hourly profit is the preferred measure of performance because it is a cleaner indicator of productivity than annual profits. The latter is sensitive to the work hours of respondents, which are known to decline with age both in this and other samples of the self-employed (e.g. Fuchs, 1982). Unlike an hourly measure, an annual measure confounds productivity with labor–leisure trade-off choices. An annual performance measure would induce a downward bias in the estimate of γ (since Π_s would then decrease in s), so the hourly measure is preferred. Next, hourly profits were averaged over each spell. Averaging over a spell reduces the influence of idiosyncratic shocks, generating a more stable measure of venture performance (i.e. one which is less prone to the influence of chance). Although non-positive profits were observed in a few individual years in the sample, averaging over multiple years resulted in positive spell-average hourly profits being observed for all cases. Finally, the logarithm of spell-average performance was taken to obtain Π. As well as correcting for skewness, a log transformation factors out any tendency to under-report incomes in the data.[7]

[6] Although it is possible that individuals found and run more than one distinct business sequentially within a spell, cross-checking with data on industry codes suggest that this may affect at most a small minority (no more than 3%) of respondents. Even then, industry miscoding can account for these cases; and all of the empirical analyses reported below were robust to excluding them. Years where serials mixed paid employment with self-employment ("work mixing") were also excluded, as were observations where gaps between spells involved work mixing and no change in industry code. Including cases where such mixing occurred (60 cases) did not change the results.

[7] For example, if true profits Π are under-reported by a factor of $0<k<1$ (where k may vary from person to person: Feldman and Slemrod, 2007), then measured profits are $k\Pi$. Taking logs yields measured log profits as $\log(k)+\log(\Pi)$. Hence the under-reporting factor gets washed into the (person-specific) intercept term, which is then differenced away in the estimation (see Section 4.3). The results below are therefore robust to income under-reporting bias (and to systematic work-hours under-reporting). See Ajayi-obe and Parker (2005) for further details.

Table 2
Spell frequencies and spell lengths.

No. spells, s	Frequency (no. of sample cases)	Average spell length (years)	No. of individual-spell units
1	481	4.48	481
2	140	4.00	280
3	55	2.95	165
4	16	2.81	64
5	11	2.56	55
6	4	2.17	24

4.2.2. Control variables

For reasons explained in the next sub-section, only time-varying control variables can be included in the empirical estimation. The time-varying controls used here include age, family size, log house prices, industry dummies and year-of-entry dummies. Age is included to control for possible changes in preferences and capabilities over entrepreneurs' life spans (Lévesque et al., 2002; Mincer, 1974). Family size captures household demographic structures which may also affect the performance of entrepreneurial ventures (Hundley, 2001). For example, supporting a large family may discourage risk taking, leading entrepreneurs to choose more conservative business strategies and hence more modest venturing opportunities (Watson and Robinson, 2003). House prices, which are available in every year of the PSID and are deflated by the CPI, serve as a proxy for wealth (which is reported in only a few waves of PSID). House prices are a potentially good proxy because the majority of most Americans' wealth is held in the form of housing (Belsky and Prakken, 2004). This variable has also been used in previous studies of entrepreneurship (Hurst and Lusardi, 2004). To address concerns about causality, values of this and the other control variables were coded in the year prior to the start of the present spell. Finally, time and industry dummies associated with the start of each spell are also included, to account for the possibility that there are systematic differences in entrepreneurial performance which vary across industry and over time. All estimations utilize weights to make the data nationally representative.

Several time-invariant control variables were also available for some additional analysis, as will be explained below. These include years of education, whether the individual had a postgraduate education and whether they were retired. Table 3 presents descriptive statistics about the sample of serial entrepreneurs. These statistics are broadly consistent with previous studies of the US self-employed in terms of industry concentration, age, education and part time status (Parker, 2009a). Correlation coefficients are generally modest; no signs of collinearity were detected in the econometric analysis.

4.3. Methods

The following dynamic panel data (DPD) regression model is used to estimate performance trajectories:

$$\Pi_{i,s} = \alpha_i + \gamma \Pi_{i,s-1} + \beta X_{i,s} + \varepsilon_{is}. \tag{2}$$

Here the index i denotes a serial entrepreneur with multiple spells and s is an integer denoting the spell number; $\varepsilon_{i,s}$ is a random error term. As noted above, $\Pi_{i,s}$ is the log average financial performance of i in spell s. $X_{i,s}$ are the time-varying control variables described above. As discussed in Section 3.1, α_i captures i's "long run" performance in entrepreneurship, while γ determines the type of serial entrepreneur performance trajectory over successive ventures.

Eq. (2) is estimated using DPD econometric methods. Ordinary least squares and fixed effects (FE) estimators are known to be biased and inconsistent when a lagged dependent variable is present (Bond, 2002). A consistent alternative estimator is the Anderson and Hsiao (1981) instrumental variable (IV) estimator. This estimator (i) differences both sides of Eq. (2) to remove the unobserved fixed effect α_i (where differencing is performed over spells rather than years) and (ii) instruments the differenced lagged value of performance on the right-hand side by its two-spell-ago value in levels (Anderson and Hsiao, 1981). As is well known in panel data estimation, an implication of the differencing (i) is that any time-invariant variables (e.g. years of education) are not identified and cannot enter the vector $X_{i,s}$; only time-varying variables can be included. An implication of the instrumentation (ii) is that Eq. (2) can be estimated only for serial entrepreneurs with three or more entrepreneurial spells — which is of course consistent with our definition of entrepreneurship above.[8] All estimations use White's correction for heteroscedasticity to generate robust standard errors. We also checked whether the results are affected by weighting the regressions using the length of the current spell, to reduce the impact of very short spells; this made no difference to the results (available on request).

[8] Another consistent estimator, by Arrelano and Bond (1991), is more demanding of the data, requiring at least four spells in entrepreneurship. There are insufficient data in the sample to implement this estimator in LIMDEP 8.0, despite the potential gains in efficiency it entails.

Table 3
Means, standard deviations and correlations.

	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Performance, Π	2.26	0.83										
2. Prev. spell length	2.19	1.90	0.02									
3. Part-time	0.12	0.33	-0.07	0.04								
4. Un. just before spell	0.17	0.38	-0.12^{*}	0.14^{*}	0.34^{***}							
5. Age	43.75	14.55	-0.07	0.19^{**}	0.46^{***}	0.41^{***}						
6. Retired	0.11	0.31	-0.07	0.08	0.45^{***}	0.54^{***}	0.66^{***}					
7. Years of schooling	13.19	2.78	0.41^{***}	-0.11^{*}	-0.22^{***}	-0.17^{**}	-0.35^{***}	-0.31^{***}				
8. Postgraduate	0.11	0.32	0.29^{***}	-0.03	0.00	-0.02	0.02	0.01	0.36^{***}			
9. Family size	3.32	1.73	0.17^{**}	-0.16^{**}	-0.19^{***}	-0.28^{***}	-0.23^{***}	-0.29^{***}	0.06	-0.02		
10. Log 1 + house price	7.45	5.20	0.28^{***}	0.03	0.02	0.01	0.38^{***}	0.16^{**}	0.06	0.17^{**}	0.20^{***}	
11. Agriculture	0.11	0.31	-0.22^{***}	0.01	0.02	0.07	0.11^{*}	0.22^{***}	-0.44^{***}	-0.13^{*}	-0.06	-0.15^{**}
12. Manufacturing	0.05	0.22	0.21^{***}	-0.01	0.06	-0.02	0.04	0.08	0.06	-0.04	-0.13^{*}	0.07
13. Construction	0.15	0.36	-0.18^{***}	0.04	-0.01	-0.03	-0.11^{*}	-0.09^{+}	0.00	-0.13^{*}	0.13^{*}	-0.04
14. Trade	0.13	0.34	-0.04	0.08	0.05	-0.07	-0.01	-0.10^{+}	-0.03	-0.14^{*}	-0.01	0.02
15. FIR	0.18	0.38	0.07	0.01	-0.06	0.11^{*}	0.13^{*}	0.01	0.13^{*}	-0.08	0.03	0.23^{***}
16. Services	0.14	0.34	-0.04	0.08	0.09^{+}	0.11^{*}	-0.01	0.14	-0.14^{*}	0.03	-0.23^{***}	-0.14^{*}
17. Professional	0.19	0.39	0.22^{***}	-0.12^{*}	-0.04	-0.10^{+}	-0.09^{+}	-0.11^{*}	0.38^{***}	0.48^{***}	0.04	-0.01

Industry dummies are designed to be exclusive so correlations between them are not reported. Π is the log of hourly spell-average profits (see text). FIR is finance, insurance and real estate. $^{+}$Denotes significance at 10%; *significance at 5%; **significance at 1%; and ***significance at 0.1%.

5. Results

5.1. Performance trajectories

Table 4 presents the results of estimating the DPD model (2) by IV. The key parameter of interest is the coefficient on Π_{s-1}, i.e. γ. Column 1 estimates a simple version of Eq. (2) without any control variables. Column 2 adds the time-varying controls (age, family size and house price); column 3 adds industry dummies; and column 4 adds to all of these time (i.e. year of spell entry) dummies.

The results presented in Table 4 reveal positive and significant estimates of γ, which range from 0.38 in specification 1 to 0.29 in specification 4. These estimates are all significantly different from one and zero.[9] This is consistent with the "depreciating" performance trajectory T3, which predicts that performance remains above (or below) the mean performance over successive ventures, but eventually converges towards it. Hence Hypothesis 1c is supported, while Hypotheses 1a (ever-increasing trajectory) and 1b (cycling trajectory) – as well as Hypothesis 0 (flat trajectory) – are rejected. That is, the data show that high performance in one venturing spell also enhances performance in future venturing spells. However, these γ estimates suggest that benefits from venturing have only temporary effects which eventually die away. That is, in contrast to popular views about serial entrepreneurship, the results support neither the notion of an ever-increasing performance trajectory, nor the alternative notion that good performance is more likely to follow bad performance while bad performance is more likely to follow good performance.

To gauge how rapidly the benefits embodied in previous performance dissipate, one can calculate a "half life" based on the estimate of γ. Because the control variables, industry and time dummies are jointly insignificant, our preferred (most efficient) specification is that of column 1, with a γ estimate of 0.38. The half-life is the time it takes before one-half of the benefits derived from one spell of venturing have been used up. For $\gamma=0.38$, the half-life can be computed as $\log(0.50)/\log(0.38)=0.72$.[10] This means that on average one-half of the benefits derived from a spell s have been exploited 72% of the way through spell $s+1$. The remaining benefits accrue over the rest of spell $s+1$ and subsequent venturing spells.

The theoretical arguments for Hypothesis 1c rest on the notion of depreciation of human and social capital. If this is true, then serial entrepreneurs with longer gaps between venturing spells should exhibit greater depreciation, i.e. a lower γ. Hence if entrepreneurs with only short gaps between spells are excluded from the sample, one would expect estimates of γ to decrease.[11] Column 1 of Table 5 presents the results of re-estimating the preferred (most efficient) specification 1 of Table 4 by dropping from the sample all serial entrepreneurs with gaps of at most two years between their spells. In accordance with the notion of depreciation, estimates of γ are indeed observed to fall. As a robustness check, column 2 drops all cases with gaps of at most three years between all pairs of spells. Estimates of γ drop further still and become statistically insignificant.

[9] E.g. in column 1, $z=0.38/0.10=3.80$, rejecting H_0^0: $\gamma=0$. And $z=(1-0.38)/0.10=6.20$, rejecting H_0^1: $\gamma=1$.

[10] Formally, the half-life, S, is calculated as the solution of $1/2 \ln \Pi_0=\gamma^S \ln \Pi_o$, which given $\gamma=0.38$ solves S as 0.72.

[11] This approach is preferable to trying to omit those with long gaps between spells, because most cases with one long gap also had one or more short gaps. Hence excluding those with only short gaps is a more clear-cut approach.

Table 4
IV estimation of the DPD performance model.

	1	2	3	4
Π_{s-1}	0.38*** (0.10)	0.37*** (0.10)	0.28** (0.09)	0.29** (0.10)
Age/10		−0.06 (0.05)	−0.04 (0.05)	−0.02 (0.06)
Family size		−0.01 (0.04)	−0.01 (0.04)	−0.02 (0.04)
Log house price		0.01 (0.01)	0.00 (0.01)	0.00 (0.01)
Industry controls?	No	No	Yes	Yes
Time dummies?	No	No	No	Yes
N	297	297	273	273
Log likelihood (LL)	−412.09	−410.24	−351.46	−339.68
Change in LL (ΔLL)	–	1.85	–	11.78
p value for ΔLL	–	0.60	–	0.98

Dependent variable: Π_s (logged, as is Π_{s-1}). Unit of analysis: individual spells. Robust standard errors are in parentheses. +Indicates significance at 10%; *indicates significance at 5%; **indicates significance at 1%; ***indicates significance at 0.1%. N is the sample size.
A total of 24 individual spell observations were lost in columns 3 and 4 owing to some missing observations on the industry sector. Hence ΔLL cannot be calculated in column 3.

5.2. Alternative explanations for the findings

Although the evidence discussed above supports Hypothesis 1c, alternative explanations could also account for the patterns seen in the data. We consider two possibilities in what follows. First, if serial entrepreneurs run similar businesses in successive ventures, this alone might be sufficient to induce correlation in Π_s and Π_{s-1}. Second, it is possible that only entrepreneurs who were unusually "lucky" in their first venture might choose to start a second venture; but their performance eventually reverts to the mean (Lazear, 2004). This could mimic the depreciating trajectory T3 ($0<\gamma<1$) even though actually $\gamma=0$ (as per T4). That is, our results could merely reflect sample selection of initially lucky serial entrepreneurs.

We test the first possibility by investigating whether serial entrepreneurs who start ventures in different industries to their previous ventures experience different performance trajectories. We test this in two ways. First, we drop from the sample all cases where the current spell of self-employment was practiced in a different industry to the previous spell. The results are presented in column 3 of Table 5. As can be seen, the results hardly change when industry changers are excluded from the analysis. If anything, the estimate of γ drops slightly, but it remains similar to its previous value. Second, we include an interaction term of industry changers and (instrumented) Π_{s-1}, along the lines of Aiken and West (1991). Column 4 of Table 5 presents the results: the interaction is statistically insignificant, confirming the results in column 3. Hence it seems that support for Hypothesis 1c is not attributable to serial entrepreneurs remaining in the same industry and running a similar venture. Instead, serial entrepreneurs appear to enjoy benefits from venturing which are broadly transferable to new ventures regardless of whether the new venture is in the same or a different industry to the previous one.

We test the second competing explanation by testing whether entrepreneurs who received high average profits from their first venturing spell are disproportionately likely to re-enter entrepreneurship (Chen, 2009). This test involves estimating a probit model based on individual-level (not spell-level) data, where the dependent variable is coded as one if an entrepreneur tries a second spell and zero if they do not. Table 6 reports the results for four different specifications. Because this model has no fixed effects, additional control variables can be included in Table 6. The key explanatory variable is the log spell-average performance in the first spell, Π_1. As can be readily seen, the inclusion of successive controls in columns 2 through 4 quickly renders the effect of the first-spell performance on the likelihood of re-entry small and insignificant. In particular, more educated entrepreneurs are significantly more likely to become serial entrepreneurs (Kolvereid and Bullvåg, 1993). Hence we can rule out the second competing explanation as well.

In summary, neither competing explanation for our findings gains support. Hence we can tentatively conclude that the data are consistent with the depreciating trajectory posited in Hypothesis 1c. Of course, there remains the possibility of other explanations which are harder to test, including omitted variables which drive current performance and bias the estimates of γ one way or another. While this possibility can never be ruled out in any empirical work, the limited number of control variables in the PSID makes this criticism especially salient. Nevertheless, the following remarks are in order. First, any omitted variables

Table 5
IV estimation: the role of depreciation and different specifications.

	1	2	3	4	5	6
Π_{s-1}	0.32*** (0.10)	0.15 (0.11)	0.33*** (0.10)	0.33*** (0.10)	0.38*** (0.10)	
$\Pi_{s-1}\times$ind. changer				0.06 (0.25)		
f					−0.07 (0.11)	
P_{s-1}						−0.04 (0.05)
Sample exclusion	Gaps≤2	Gaps≤3	Industry changers			
N	225	154	255	189	297	129

Dependent variable: Π_s (logged, as is Π_{s-1}). Unit of analysis: individual spells. Sample exclusions and missing cases for explanatory variables reduce the sample size below 297 in columns 1–4 and 6.

Table 6
Determinants of the probability of being a serial entrepreneur.

	1	2	3	4
Π_1	0.19^{**} (0.07)	0.06 (0.09)	−0.01 (0.10)	−0.02 (0.10)
Age/10			−0.06 (0.06)	−0.02 (0.06)
Retiree			0.36 (0.33)	0.38 (0.34)
Years of education			0.05^{+} (0.03)	0.05^{+} (0.03)
Postgraduate			0.32 (0.23)	0.32 (0.23)
Family size				0.04 (0.04)
Log house price				-0.02^{*} (0.01)
Constant	-1.18^{***} (0.22)	-1.29^{***} (0.35)	-1.65^{***} (0.54)	-1.73^{***} (0.57)
Industry controls?	No	Yes	Yes	Yes
Time dummies?	Yes	Yes	Yes	Yes
N	707	617	612	612
Log likelihood	−409.74	−330.80	−323.00	−320.16
χ^2	68.06^{***}	88.61^{***}	100.67^{***}	106.37^{***}

Dependent variable: binary, taking a value of 1 if an entrepreneur tried a second venturing spell, and zero otherwise. Π_1 is the log hourly spell-average profit in the first spell. Unit of analysis: individuals. Robust standard errors are in parentheses.
$^{+}$ Denotes significance at 10%; * significance at 5%; ** significance at 1%; and *** significance at 0.1%.

would need to be correlated with lagged performance for any bias in γ to occur (Greene, 2003). Second, many determinants of performance, such as ability (Hartog et al., 2010) and education (Iversen et al., 2010) are time-invariant and so are differenced away in the estimation of Eq. (2) [see Section 4.3 above]. Third, it is possible to conduct some robustness checks which we turn to next.

5.3. Robustness checks

The first robustness check explores whether our use of performance spell averages might have generated misleading results. For example, there might be too few cases in the dataset with four or more spells to be able to identify a cycling trajectory. To address this concern, we take a different tack and ask whether poor performance in the final year of a spell has a disproportionate positive impact on the average performance in the next spell. That might be consistent with the over-reaction inherent in a cycling trajectory if the poor final year performance in a spell reflects cathartic "failure". To explore this possibility, a dummy variable f is defined to take the value 1 if the final-year performance of a spell is worse than its average over the spell and 0 otherwise. Column 5 of Table 5 shows that the coefficient on f carries a *negative* sign when this variable is added to the DPD model — and is statistically insignificant, casting further doubt on the relevance of the cycling trajectory.

Second, we test whether the results are similar if we replace Π_{s-1} with a measure of prior venturing experience. We follow Dyke et al. (1992) and Stuart and Abetti (1990) by using the number of previous spells, P_{s-1}, as a measure. Column 6 of Table 5 shows that the coefficient on P_{s-1} is small, negative and insignificant. One interpretation of this result is that Π_{s-1} embodies the productive benefits of prior venturing experience, while P_{s-1} counts involvement but not productive benefits from venturing.

The third robustness check recognizes the possibility that entrepreneurs are heterogeneous (Birley and Westhead, 1994), and that combining heterogeneous entrepreneurs together in a single sample might dilute the evidence of a depreciating performance trajectory. To explore this possibility, we excluded the following groups from the sample: part-timers (those defined as working less than 30 h per week); retirees (those aged over 65); and those unemployed in the year just prior to a venturing spell. In unreported results (available on request) the estimates of γ for the remaining sub-samples were not qualitatively different from those reported in Table 4.

Fourth, we also tried including a dummy variable taking the value of one for entrepreneurs who were observed "mid-spell" at the start of the survey. This permits a rough check of whether left-censoring affects the estimates. The results (also available on request) showed no significant changes when this variable was included, nor when 'mid-spell' observations were dropped from the sample.

6. Discussion and conclusion

This paper has analyzed the performance trajectories of serial entrepreneurs over successive ventures. It has answered the call of Ucbasaran et al. (2008, Sec. 7) for more research on habitual entrepreneurship which: (a) emphasizes the role of the entrepreneur rather than the firm; (b) conducts analysis based on a large, representative and longitudinal dataset; and (c) analyzes the performance of serial entrepreneurs, especially the determinants of serial entrepreneurs' productivity.

The paper drew on prior literature to generate a set of competing hypotheses about serial entrepreneurs' performance trajectories. These were tested against each other using a nationally representative sample of longitudinal US data spanning one-quarter of a century. A key finding of the paper is that performance trajectories exhibit mean reversion. Although serial entrepreneurs' performance in one venture appears to enhance their performance in subsequent ventures, these positive effects are nearly completely exhausted by the end of the next spell. These findings are consistent with the notion that benefits from venturing are temporary, and depreciate over time. This interpretation is strengthened by evidence showing that the longer the gap between venturing spells of a given entrepreneur, the more depreciation takes place. The finding of positive temporary benefits from venture spells contrasts with two “popular” alternative views which posit ever-improving performance, or cycling levels of performance over successive ventures.

6.1. Implications of the findings

This paper generates several theoretical implications. First, it adds to the growing literature on human capital models of entrepreneurial performance (Davidsson and Honig, 2003; Ucbasaran et al., 2008, 2009; Unger et al., 2011). The present paper extends human capital theory into the domain of serial entrepreneurship, by emphasizing the acquisition of knowledge and skills derived directly from the venturing process, and embodied in a sequence of venture performance outcomes. This contrasts with much prior work which has often focused on education and other types of formal human capital (e.g. Parker and van Praag, 2006). It is hoped that future theorizing about serial entrepreneurship might find this perspective on dynamic human capital acquisition a useful one.

Second, the paper has emphasized a hitherto little-considered aspect of human capital in the entrepreneurship domain, namely its *depreciation* and how that impacts future entrepreneurial performance. We believe that future theorizing in entrepreneurship research could benefit from incorporating the insight of human capital depreciation into models of entrepreneurial performance, especially when a time dimension is involved, as in serial entrepreneurship. Third, the findings of the paper highlight the possible limitations of theories which emphasize competency traps and limited learning, as in the work of March (1991) for example. While limited learning and competency traps might well be a feature of large organizations, which March (1991) and March et al. (1991) actually focused on, such reasoning might enjoy limited applicability in the sphere of serial entrepreneurship. This suggests a boundary condition on theories of limited learning. Of course, however, that must remain a tentative conjecture given the indirect nature of the evidence assembled in our paper.

Several practical implications also follow from our findings. First, an implication for resource providers such as financiers is that one should not expect the performance of a serial entrepreneur's next venture to exceed, or even match, that of their current one. Awareness of this result may call for a re-evaluation of financing practices by lenders, given independent evidence that financiers value entrepreneurs' track records. In addition, the finding of similar performance trajectories for serial entrepreneurs who switch industries could make financiers less concerned about lending to serial entrepreneurs looking to establish new ventures in different industries to their previous ones.

Second, the results in this paper might encourage individuals who are not yet entrepreneurs to take the plunge and give entrepreneurship a try. Our findings suggest that entrepreneurs can anticipate benefits from venturing which will help them in future ventures that they start, a realization which could fortify them to brave the hazards of poor performance, including failure (Hayward et al., 2010; Shepherd, 2003). Third, our results suggest that these benefits can only be realized if entrepreneurs do not delay too long before re-entry — and provided they are not constrained from re-entry by onerous bankruptcy laws, for example. Future benefits from current venture performance imply that tough bankruptcy laws which inhibit timely re-entry may preclude favorable future entrepreneurial performance. Consequently, bankruptcy laws should perhaps err on the side of leniency to entrepreneurs rather than draconian punishment — consistent with recommendations by other researchers (Fan and White, 2003; Lee et al., 2011; Manove and Padilla, 1999). This recommendation chimes with some actual policy changes, such as the UK's 2004 Enterprise Act, which reduced the time to discharge from bankruptcy from three years to one year.

The general point here is that the depreciating entrepreneurial performance trajectory we found evidence for in this paper supports policies which encourage timely re-entries. The promise of future benefits from venturing could also make practitioners and policy-makers less anxious about damaging effects of over-optimism (Coelho et al., 2004) and high closure rates of entrepreneurial ventures (Evans and Leighton, 1989). These insights contribute to the growing policy discussion about habitual entrepreneurship in general and serial entrepreneurs in particular (Westhead et al., 2003, 2005).

Fourth, our findings cast doubt on the value of using the number of previous businesses as a proxy for entrepreneurial experience in static performance regressions. Instead, we suggest that a dynamic panel analysis of serial entrepreneurs' performance may be more appropriate. Performance embodies realized benefits of venturing, unlike simple count proxies of numbers of prior ventures which do not take account of benefits obtained. A further implication for empirical researchers, mentioned above, is to recognize that binary choice models of transitions to entrepreneurship may need to take into account not only the expected benefits of the proposed venture, but also the option value of possible future ventures which can leverage benefits from the first one.

6.2. Limitations

Naturally, this paper is prone to several limitations. One important set of limitations relates to the data. Ideally, one would like to identify the deep mechanisms at work behind performance trajectories, for example whether entrepreneurs' dynamic performance is driven by learning and skill acquisition, social or financial capital accumulation, or by changing market environments. That might enable researchers to formulate boundary conditions, i.e. the conditions under which one trajectory is more likely to be observed than another. Unfortunately, the PSID lacks variables that can be used to distinguish empirically between these underlying mechanisms. Hence the empirical results presented in this paper must be treated with requisite caution. In addition, the PSID data relate to only one country, so it is unclear whether the findings extend to other economies or cultural settings.

The PSID also lacks information relating to detailed cognitive dimensions of human capital (Busenitz and Barney, 1997), as well as future expectations (Cassar, 2010; Townsend et al., 2010); reasons for, and types of, closure (Amaral et al., 2011; Wennberg et al., 2010); sources and amounts of financial support (Elston and Audretsch, 2010); and different modes of entry and organizational structures of sequential ventures (Ucbasaran et al., 2003). A dataset with rich information on these individual and organizational variables could be used to extend our knowledge about serial entrepreneurs' performance trajectories in a range of interesting directions. Unfortunately, there appears to be no dataset possessing all of these features at the time of writing; and it would doubtless be a challenging task to collect detailed data on these constructs over a long enough time span — and with enough cases, to generate representative findings. Perhaps the best compromise for future data collection is to adopt a large-scale research design with retrospective questions that allow event histories to be reconstructed ex post (Rosa, 1998; Ucbasaran et al., 2008, 426).

Furthermore, it is possible that the PSID over-samples serial entrepreneurs who are not deeply committed to entrepreneurship as a life or career choice, but who instead switch between serial entrepreneurship and other employment outcomes in response to changing labor market conditions.[12] Moreover, the serial entrepreneurs captured in the PSID may be running economically marginal enterprises which do not need heavy investment of financial resources. That would be consistent with the use of a self-employment measure to operationalize entrepreneurship.[13] While the PSID does not allow the researcher to determine the accuracy of this conjecture, this needs to be stated as a boundary condition on the present study. Another possible limitation is the scarcity of sample cases that experienced four or more spells of entrepreneurship. It cannot be ruled out that the paucity of such cases in the PSID might be responsible for a failure to detect any cycling performance trajectory in this paper.

Another concern is that the data (which stop in 1992) might be dated. Technological progress and changing patterns of labor force participation could mean that serial entrepreneurship today is fundamentally different from what it was like in the late twentieth century. On the one hand, it might be easier to start a business today, for example using crowdfunding sources which were unavailable twenty years ago. This could imply that the present study has underestimated the extent of serial entrepreneurship in the American economy. On the other hand, there is no reason to believe that the changing nature of entrepreneurship has fundamentally affected the performance trajectories of serial entrepreneurs. The greater ease of starting a venture may indeed have increased the number of "casual" serial entrants today compared with twenty years ago; but that might even allay some concerns about the dataset we have used as noted above. Nevertheless, we cannot rule out the possibility that our estimates of performance trajectories are outdated in some sense, or possibly even give a spurious idea of the precision of those trajectories.

Although this study has analyzed performance trajectories *across* different ventures of given serial entrepreneurs, it has had little to say about what happens *within* ventures, in terms of creation and development processes, for example. Once again, richer data than the PSID are needed to address these and related questions, including the *relative* importance of human, social and financial capital in driving performance within and between ventures. Furthermore, future researchers might utilize a different set of performance outcomes than productivity, as used here; and there might also be interest in focusing more at the level of the venture, in order to take account of serial team ownership, for example (Ucbasaran et al., 2006).

Serial entrepreneurship is clearly an important topic which is attracting increasing research attention. The performance of serial entrepreneurs is a major component of this research agenda. By investigating the performance trajectories of serial entrepreneurs over their successive ventures, the present study has generated a range of findings which shed light on several outstanding issues in entrepreneurship research, while also challenging future researchers to build on and extend these insights in future work.

References

Aiken, L.S., West, S.G., 1991. Multiple Regression: Testing and Interpreting Interactions. Sage, Newbury Park, CA.

Ajaye-obe, O., Parker, S.C., 2005. The changing nature of work among the self-employed in the 1990s: evidence from Britain. Journal of Labor Research 26, 501–517.

Albrecht, J.W., Edin, P., Sundström, M., Vroman, S.B., 1999. Career interruptions and subsequent earnings: a reexamination using Swedish data. Journal of Human Resources 34, 294–311.

Alsos, G.A., Kolvereid, L., Isaksen, E.J., 2006. New business early performance: differences between firms started by novice, serial and portfolio entrepreneurs. In: Christensen, P.R., Poulfeldt, F. (Eds.), Managing Complexity and Change in SMEs. Edward Elgar, Cheltenham UK, pp. 35–49.

Alvarez, S.A., Parker, S.C., 2009. Emerging firms and the allocation of control rights: a Bayesian approach. Academy of Management Review 34, 209–227.

Amabile, T.M., 1997. Motivating creativity in organizations, on doing what you love and loving what you do. California Management Review 40, 39–58.

Amaral, A.M., Baptista, R., Lima, F., 2011. Serial entrepreneurship: impact of human capital on time to re-entry. Small Business Economics 37 (1), 1–21.

Anderson, T.W., Hsiao, C., 1981. Estimation of dynamic models with error components. Journal of the American Statistical Association 76, 598–606.

Argote, L., 1999. Organizational Learning: Creating, Retaining and Transferring Knowledge. Kluwer, Boston MA.

Argote, L., Becman, S.L., Epple, D., 1990. The persistence and transfer of learning in industrial settings. Management Science 36, 140–154.

Armstrong, J.S., Brodie, R.J., Parsons, A.G., 2001. Hypotheses in marketing science: literature review and publication audit. Marketing Letters 12 (2), 171–187.

Arrelano, M., Bond, S.R., 1991. Some tests of specification for panel data. Review of Economic Studies 58, 277–297.

Audia, P.G., Locke, E.A., Smith, K.G., 2000. The paradox of success: an archival and laboratory study of strategic persistence following radical environmental change. Academy of Management Journal 43 (5), 837–853.

Barney, J., 1991. Firm resources and sustained competitive advantage. Journal of Management 17 (1), 99–120.

[12] I am grateful to an anonymous reviewer for this suggestion.

[13] There are many well-worn arguments against treating the self-employed as entrepreneurs (Parker, 2009a); hence future researchers might prefer to focus attention on e.g. high-tech venture founders, where the acquisition and retention of human capital, social capital and financial capital might be more critical to venture success. In this case, one might even observe greater interdependence of performance across successive ventures.

Baron, R.A., Ensley, M.D., 2006. Opportunity recognition as the detection of meaningful patterns: evidence from comparisons of novice and experienced entrepreneurs. Management Science 52 (9), 1331–1344.

Bates, T., 2005. Analysis of young, small firms that have closed: delineating successful from unsuccessful closures. Journal of Business Venturing 20, 343–358.

Baurnard, P., Starbuck, W.H., 2005. Learning from failures: why it may not happen. Long Range Planning 38 (3), 281–298.

Belsky, E., Prakken, J., 2004. Housing wealth effects: housing's impact on wealth accumulation, wealth distribution and consumer spending. Report W04-13. Joint Center for Housing Studies, Harvard University.

Birley, S., Westhead, P., 1994. A taxonomy of business start-up reasons and their impact on firm growth and size. Journal of Business Venturing 9, 7–31.

Bond, S.R., 2002. Dynamic panel data models: a guide to micro data methods and practice. Portuguese Economic Review 1 (2), 141–162.

Busenitz, L.W., Barney, J.B., 1997. Differences between entrepreneurs and managers in large organizations: biases and heuristics in strategic decision-making. Journal of Business Venturing 12, 9–30.

Caliendo, M., Fossen, F.M., Kritikos, A.S., 2010. The impact of risk attitudes on entrepreneurial survival. Journal of Economic Behavior and Organization 76, 45–63.

Cardon, M.S., Stevens, C.E., Potter, D.R., 2011. Misfortunes or mistakes? Cultural sensemaking of entrepreneurial failure. Journal of Business Venturing 26 (1), 79–92.

Cassar, G., 2010. Are individuals entering self-employment overly optimistic? An empirical test of plans and projections on nascent entrepreneur expectations. Strategic Management Journal 31, 822–840.

Chen, J., 2009. Selection and serial entrepreneurs, Mimeo, Copenhagen Business School.

Coelho, M.P., de Meza, D., Reyniers, D.J., 2004. Irrational exuberance, entrepreneurial finance and public policy. International Tax and Public Finance 11, 391–417.

Cooper, A.C., Woo, C.Y., Dunkelberg, W.C., 1988. Entrepreneurs' perceived chances for success. Journal of Business Venturing 3, 97–108.

Cope, J., 2005. Toward a dynamic learning perspective of entrepreneurship. Entrepreneurship Theory and Practice 29 (4), 373–397.

Cope, J., 2011. Entrepreneurial learning from failure: an interpretative phenomenological analysis. Journal of Business Venturing 26 (6), 604–623.

Davidsson, P., Honig, B., 2003. The role of human and social capital among nascent entrepreneurs. Journal of Business Venturing 18, 301–333.

de Meza, D., 2002. Overlending? The Economic Journal 112, F17–F31.

de Meza, D., Southey, C., 1996. The borrower's curse: optimism, finance and entrepreneurship. The Economic Journal 106, 375–386.

Dyke, L.S., Fischer, E.M., Reuber, A.R., 1992. An inter-industry examination of the impact of owner experience on firm performance. Journal of Small Business Management 2, 72–87.

Elston, J.A., Audretsch, D.B., 2010. Risk attitudes, wealth and source of entrepreneurial start-up capital. Journal of Economic Behavior and Organization 76 (1), 82–89.

Entrepreneurship Magazine, 2009. Turn Failures into Fortunes. http://www.entrepreneur.com/startingabusiness/article204244.html Retrieved 22 June, 2010.

Evans, D.S., Leighton, L.S., 1989. Some empirical aspects of entrepreneurship. American Economic Review 79, 519–535.

Fan, M., White, M.J., 2003. Personal bankruptcy and the level of entrepreneurial activity. Journal of Law and Economics 46, 543–567.

Feldman, N.E., Slemrod, J., 2007. Estimating tax non-compliance with evidence from unaudited tax returns. The Economic Journal 117, 327–352.

Flores-Romero, M., 2006. An empirical examination into the job generation capacity of serial entrepreneurs. Paper presented at the Max Planck Institute of Economics, Jena, Germany.

Fossen, F.M., 2012. Gender differences in entrepreneurial choice and risk aversion — a decomposition based on a microeconometric model. Applied Economics 44, 1795–1812.

Fozard, J.L., Nuttall, R.L., 1971. General aptitude test battery scores for men differing in age and socio-economic status. Journal of Applied Psychology 55 (4), 372–379.

Fuchs, V.R., 1982. Self-employment and labor force participation of older males. Journal of Human Resources 17, 339–357.

Gompers, P., Kovner, A., Lerner, J., Scharfstein, D., 2010. Performance persistence in entrepreneurship. Journal of Financial Economics 96, 18–32.

Greene, W.H., 2003. Econometric Analysis, Fifth Edition. Prentice-Hall, New Jersey.

Hartog, J., van Praag, M., van der Sluis, J., 2010. If you're so smart, why aren't you an entrepreneur? Returns to cognitive and social ability: entrepreneurs versus employees. Journal of Economics & Management Strategy 19 (4), 947–989.

Haunschild, P.R., Sullivan, B.N., 2002. Learning from complexity: effects of airline accident/incident heterogeneity on subsequent accident/incident rates. Administrative Science Quarterly 47, 609–643.

Hawley, F.B., 1907. Enterprise and the Productive Process. Putnam, New York.

Hayward, M.L.A., Shepherd, D.A., Griffin, D., 2006. A hubris theory of entrepreneurship. Management Science 52 (2), 160–172.

Hayward, M.L.A., Forster, W.R., Sarasvathy, S.D., Frederickson, B.L., 2010. Beyond hubris: how highly confident entrepreneurs rebound to venture again. Journal of Business Venturing 25 (6), 569–578.

Hundley, G., 2001. Why women earn less than men in self-employment. Journal of Labor Research 22, 817–829.

Hunter, J., 1986. Cognitive ability, cognitive attitudes, job knowledge and job performance. Journal of Vocational Behavior 29, 340–362.

Hurst, E., Lusardi, A., 2004. Liquidity constraints, household wealth and entrepreneurship. Journal of Political Economy 112, 319–347.

Iversen, N., Malchow-Møller, N., Sørensen, A., 2010. Returns to schooling in self-employment. Economics Letters 109, 179–182.

Jovanovic, B., 1982. Selection and the evolution of industry. Econometrica 50, 649–670.

Kihlstrom, R.E., Laffont, J.J., 1979. A general equilibrium entrepreneurial theory of firm formation based on risk aversion. Journal of Political Economy 87, 719–749.

Kim, J.-Y., Kim, J., Miner, A.S., 2009. Organizational learning from extreme performance experience: the impact of success and recovery experience. Organization Science 20 (6), 958–978.

Kolvereid, L., Bullvåg, E., 1993. Novices versus experienced founders: an exploratory investigation. In: Birley, S., MacMillan, I., Subramony, S. (Eds.), Entrepreneurship Research, Global Perspectives. Elsevier, Amsterdam, pp. 275–285.

Lampel, J., Shamsie, J., Shapira, Z., 2009. Experiencing the improbable: rare events and organizational learning. Organization Science 20 (5), 835–845.

Landier, A., 2006. Entrepreneurship and the stigma of failure, Mimeo, Stern School of Business, NYU.

Landier, A., Thesmar, D., 2009. Financial contracting with optimistic entrepreneurs. Review of Financial Studies 22, 117–150.

Lazear, E.P., 2004. The Peter Principle: a theory of decline. Journal of Political Economy 112 (S1), S141–S163.

Lee, S.-H., Yamakawa, Y., Peng, M.W., Barney, J.B., 2011. How do bankruptcy laws affect entrepreneurship development around the world? Journal of Business Venturing 26 (5), 505–520.

Lévesque, M., Shepherd, D.A., Douglas, E.J., 2002. Employment or self-employment: a dynamic utility-maximizing model. Journal of Business Venturing 17, 189–210.

Levinthal, D.A., March, J.G., 1993. The myopia of learning. Strategic Management Journal 14, 95–112.

Lord, R.G., Maher, K.J., 1990. Alternative information-processing models and their implications for theory, research and practice. Academy of Management Review 15, 9–28.

MacMillan, I.C., 1986. To really learn about entrepreneurship, let's study habitual entrepreneurs. Journal of Business Venturing 1, 241–243.

Manove, M., Padilla, A.J., 1999. Banking (conservatively) with optimists. The Rand Journal of Economics 30, 324–350.

March, J.G., 1991. Exploration and exploitation in organizational learning. Organization Science 2, 71–87.

March, J.G., Sproull, L.S., Tamuz, M., 1991. Learning from samples of one or fewer. Organization Science 2, 1–13.

McGrath, R.G., 1999. Falling forward: real options reasoning and entrepreneurial failure. Academy of Management Review 24, 13–30.

Mincer, J., 1974. Schooling, Experience and Earnings. Columbia University Press, New York.

Mincer, J., Ofek, H., 1982. Interrupted work careers: depreciation and restoration of human capital. Journal of Human Resources 17 (1), 3–24.

Minniti, M., Bygrave, W.B., 2001. A dynamic model of entrepreneurial learning. Entrepreneurship: Theory and Practice 25, 5–16.

Moore, D.A., Oesch, J.M., Zietsma, C., 2007. What competition? Myopic self-focus in market entry decisions. Organization Science 18 (3), 440–454.

Murphy, K.R., 1989. Is the relationship between cognitive ability and job performance stable over time? Human Performance 2, 183–200.

Neuman, S., Weiss, A., 1995. On the effects of schooling vintage on experience-earnings profiles: theory and evidence. European Economic Review 39, 943–955.

Nystrom, P., Starbuck, W., 1984. To avoid organizational crises, unlearn. Organizational Dynamics 13, 53–65.
Parker, S.C., 1997. The effects of risk on self-employment. Small Business Economics 9, 515–522.
Parker, S.C., 2006. Learning about the unknown: how fast do entrepreneurs adjust their beliefs? Journal of Business Venturing 21, 1–26.
Parker, S.C., 2009a. The Economics of Entrepreneurship. Cambridge University Press, Cambridge.
Parker, S.C., 2009b. Can cognitive biases explain venture team homophily? Strategic Entrepreneurship Journal 3 (1), 67–83.
Parker, S.C., van Praag, C.M., 2006. Schooling, capital constraints and entrepreneurial performance: the endogenous triangle. Journal of Business & Economic Statistics 24, 416–431.
Pe'er, A., Vertinsky, I., 2008. Firm exits as a determinant of new entry: is there evidence of local creative destruction? Journal of Business Venturing 23, 280–306.
Plehn-Dujowich, J., 2010. A theory of serial entrepreneurship. Small Business Economics 35 (4), 377–398.
Politis, D., 2005. The process of entrepreneurial learning: a conceptual framework. Entrepreneurship Theory and Practice 29 (4), 399–424.
Politis, D., 2008. Does prior start-up experience matter for entrepreneurs' learning? A comparison between novice and habitual entrepreneurs. Journal of Small Business and Enterprise Development 15 (3), 472–489.
Rae, D., Carswell, M., 2000. Using a life-story approach in researching entrepreneurial learning: the development of a conceptual model and its implications in the design of learning experiences. Education and Training 42 (4/5), 220–227.
Rerup, C., 2005. Learning from past experience: footnotes on mindfulness and habitual entrepreneurship. Scandinavian Journal of Management 21, 451–472.
Rosa, P., 1998. Entrepreneurial processes of business cluster formation and growth by “habitual” entrepreneurs. Entrepreneurship Theory and Practice 22 (4), 43–61.
Salthouse, T., 2011. Consequences of age-related cognitive declines. Annual Review of Psychology 63 (5), 1–26.
Sarasvathy, S., Menon, A., 2002. Failing firms and successful entrepreneurs: serial entrepreneurship as a temporal portfolio. Darden School working paper.
Schmidt, F.L., Hunter, J., 2004. General mental ability in the world of work: occupational attainment and job performance. Journal of Personality & Social Psychology 86, 162–173.
Shepherd, D.A., 2003. Learning from business failure: propositions of grief recovery for the self-employed. Academy of Management Review 28 (2), 318–328.
Shepherd, D.A., Covin, J.G., Kuratko, D.F., 2009. Project failure from corporate entrepreneurship: managing the grief process. Journal of Business Venturing 24 (6), 588–600.
Simon, M., Houghton, S.M., Aquino, K., 2000. Cognitive biases, risk perception, and venture formation: how individuals decide to start companies. Journal of Business Venturing 15, 113–134.
Sitkin, S.B., 1992. Learning through failure: the strategy of small losses. In: Staw, B.M., Cummings, L.L. (Eds.), Research in Organizational Behavior. JAI Press, Greenwich CT, pp. 231–266.
Stam, E., Audretsch, D.B., Meijaard, J., 2008. Renascent entrepreneurship. Journal of Evolutionary Economics 18, 493–507.
Stuart, R.W., Abetti, P.A., 1990. Impact of entrepreneurial and management experience on early performance. Journal of Business Venturing 5, 151–162.
Taylor, M.P., 1999. Survival of the fittest? An analysis of self-employment duration in Britain. The Economic Journal 109, C140–C155.
Townsend, D.M., Busenitz, L.W., Arthurs, J.D., 2010. To start or not to start: outcome and ability expectations in the decision to start a new venture. Journal of Business Venturing 25 (2), 192–202.
Ucbasaran, D., Wright, M., Westhead, P., 2003. A longitudinal study of habitual entrepreneurs: starters and acquirers. Entrepreneurship and Regional Development 15, 207–228.
Ucbasaran, D., Westhead, P., Wright, M., 2006. Habitual Entrepreneurs. Elgar, Aldershot UK.
Ucbasaran, D., Alsos, G.A., Westhead, P., Wright, M., 2008. Habitual entrepreneurs. Foundations and Trends in Entrepreneurship 4 (4), 309–450.
Ucbasaran, D., Westhead, P., Wright, M., 2009. The extent and nature of opportunity identification by repeat entrepreneurs. Journal of Business Venturing 24 (2), 99–115.
Ucbasaran, D., Westhead, P., Wright, M., Flores, M., 2010. The nature of entrepreneurial experience, business failure and comparative optimism. Journal of Business Venturing 25 (6), 541–555.
Unger, J.M., Rauch, A., Frese, M., Rosenbusch, N., 2011. Human capital and entrepreneurial success: a meta-analytical review. Journal of Business Venturing 26 (3), 341–358.
Vancouver, J.B., Thompson, C.M., Tischner, E.C., Putka, D., 2002. Two studies examining the negative effect of self-efficacy on performance. Journal of Applied Psychology 87 (3), 506–516.
Watson, J., Robinson, S., 2003. Adjusting for risk in comparing the performance of male- and female-controlled SMEs. Journal of Business Venturing 18, 773–788.
Weick, K.E., Sutcliffe, K.M., Obstfeld, D., 1999. Organizing for high reliability: processes of collective mindfulness. Research in Organizational Behavior 21, 81–123.
Wennberg, K., Wiklund, J., DeTienne, D.R., Cardon, M.S., 2010. Reconceptualizing entrepreneurial exit: divergent exit routes and their drivers. Journal of Business Venturing 25 (4), 361–375.
Westhead, P., Wright, M., 1998. Novice, portfolio and serial founders: are they different? Journal of Business Venturing 13, 173–204.
Westhead, P., Ucbasaran, D., Wright, M., 2003. Differences between private firms owned by novice, serial and portfolio entrepreneurs: implications for policy-makers and practitioners. Regional Studies 37, 187–200.
Westhead, P., Ucbasaran, D., Wright, M., 2005. Decisions, action and performance: do novice, serial and portfolio entrepreneurs differ? Journal of Small Business Management 43, 393–417.
Wright, M., Robbie, K., Ennew, C., 1997. Serial entrepreneurs. British Journal of Management 8, 251–268.
Zuckerman, M., 1979. Attribution of success and failure revisited, or, the motivational bias is alive and well in attribution theory. Journal of Personality 47, 245–287.