The Multiple Effects of Business Planning on New Venture Performance

Andrew Burke, Stuart Fraser and Francis J. Greene

Cranfield School of Management and Max Planck Institute of Economics; University of Warwick; University of Warwick

ABSTRACT   We investigate the multiple effects of writing a business plan prior to start-up on new venture performance. We argue that the impact of business plans depends on the purpose for and circumstances in which they are being used. We offer an empirical methodology which can account for these multiple effects while disentangling real impact effects from selection effects. We apply this to English data where we find that business plans promote employment growth. This is found to be due to the impact of the plan and not selection effects.

INTRODUCTION

Business plans are a prevalent feature of new venture management and are encouraged by government agencies, education institutions, and consultants. They are frequently a core requirement when seeking finance. There is also a widespread belief that writing a business plan will impact favourably on venture performance. Honig (2008) and Honig and Karlsson (2004), however, question if written business plans are anything more than mimetic devices that, at best, serve to legitimate the new venture.

Bhide (2000) also suggests that the impact of business plans on new venture performance is unlikely to be a generic positive, negative, or negligible effect. Instead, he argues that the efficacy of business plans is governed by the context within which business plans are written. Some are written to raise loan finance with the purpose of reassuring lenders of the low risk and secure positive cash flow position of the venture; others are written to help a founding self funded entrepreneur devise a market entry and growth strategy for a high risk innovative new product in an emerging uncertain market. The effects on performance are unlikely to be the same in such widely varying contexts.

The added complication is that the propensity of entrepreneurs to *select* to write a business plan may itself be influenced by the profile of the new venture and its business context. A venture which contains people with plenty of relevant experience may feel that writing a business plan is a costly use of time. By contrast, an entrepreneur that

knows little about the market and with 'lower' entrepreneurial capabilities may feel that the paper exercise of writing a business plan is both informative and instructive. It is, therefore, likely that, due to selection effects, the profile and context of ventures with business plans will vary systematically from those without plans. The issue here is that it is easy to confuse the true *impact* of business plans with differences in performance due to *selection effects*. Accordingly, a robust analytical framework for testing the relationship between business plans and performance should:

(1) account for the manner in which the profile and contexts of ventures that select to write business plans might systematically differ from those that do not write a plan;
(2) account for the possibility that the impact of writing business plans on new venture performance will itself depend on the profile of the new venture and the context in which the plan was written.

The importance of these two criteria has been overlooked in the literature and remedying this is the central contribution of our paper. At present, the *modus operandi* is to use discrete (1, 0) dummy variables (see Reid and Smith, 2000; Vivarelli, 2004) to test the impact of a venture having a written business plan. This typically entails using a single equation estimation approach to capture the *average* effect of business plans. It neither allows for the isolation of what we have termed *impact* effects from *selection* effects nor does it show how impact effects vary with the context in which the plan was written. The result is an ambiguous interpretation of the impact of business plans: if plans are efficacious, is this really a true impact effect or is it because more ambitious ventures are more likely to write a business plan? Overall, an average effect is clouded by venture profile and contextual differences.

Perhaps not surprisingly, the empirical literature points inconclusively to any association between business plans and venture performance. Despite considerable efforts (Bhide, 2000; Boyd, 1991; Robinson and Pearce, 1983; Robinson et al., 1986), there has been little in the way of an agreed consensus, even amongst studies that have examined established ventures as to the value of business plans (e.g. Brews and Hunt, 1999; Fredrickson and Iaquinto, 1989). This also applies to new ventures. Perry (2001), Delmar and Shane (2003), and Liao and Gartner (2006) all point to a positive relationship between business plans and survival. Gruber (2007) finds that plans help achieve marketing objectives. By contrast, Tornikoski and Newbert (2007), Haber and Reichel (2007), and Honig and Karlsson (2004) all struggle to find any relationship between business plans and performance.

One contribution of this paper is to develop and test an econometric methodology which satisfies the two criteria identified above. We use an endogenous switching regression model (Maddala, 1983; Maddala and Nelson, 1975). The model has two critical features. First, it allows for the endogeneity of business plans in venture performance. This is important because if endogeneity is ignored, biased and inconsistent estimates of the impact of plans (due to the conflation of plan effects with unobservable ability/ motivation) are likely. A traditional resolution of this problem is to use a Heckman (1979) selection model. However, models of this type fail to allow for the *interaction* of business plans effects with venture/entrepreneur profiles and the context for plans. The second

key feature of the model is that it is able to identify these interactions. Whilst other approaches could be used (such as MANOVA and multiple regression), they fail to address the issue of endogeneity. In short, the superiority of the model lies in its capacity to simultaneously address both the endogeneity of business plans and the need to identify interaction effects.

The net result is that our approach allows for a more realistic estimate of the effect writing a business plan on new venture performance. We apply the model to English data on 622 *de novo* entrepreneurs in relation to one performance measure: employment growth. In common with others, we define business plans as those activities conducted by a venture founder to gather information to exploit a business opportunity, and documented in a written business plan (Castrogiovanni, 1996; Delmar and Shane, 2003). The dataset allows us to identify some contextual (e.g. launching a new product/service, use of bank finance) and profile variables (e.g. serial/portfolio entrepreneurship, previously unemployed).

The remainder of the paper is structured as follows. In the next section, we explain how theory relating to business plans requires an empirical methodology sufficient to account for impact and selection dimensions of the relationship between business plans and new venture performance. This section begins by examining how writing a business plan can make an impact on venture performance. We then move on to discuss selection effects which may give the illusion of written business plans making an impact when, in fact, the observed difference in performance is simply due to differences in profiles/contexts. We then discuss the dataset and follow this by a discussion of the methodology. The results are then presented, followed by the discussion and conclusions.

THEORY BACKGROUND AND HYPOTHESES DEVELOPMENT

In this section we outline various theories from management (with some relevant contributions from finance and economics) which contribute to our understanding of how writing business plans may affect or be related to new venture performance. The central thrust of this paper is that the relationship between new venture performance and writing business plans is comprised of a *selection* and an *impact* effect and *where both of these vary depending on the profile and business context of the venture*. It is these interaction effects that are important in explaining the subsequent performance of the venture.

We begin by looking at theories outlining how writing a business plan can make an *impact* and then look at instances where there may be a correlation but without an actual causation (i.e. cases where due to *selection* effects the profile or nature of ventures with business plans systematically differ from those that do not engage in this activity). We then move on to discuss theory relating to *selection* effects.

Impact Effects I: Enhancing or Retarding the Efficacy of Existing Resources?

If entrepreneurial performance is driven by the ability of new ventures to successfully exploit new profit opportunities, then entrepreneurial performance is itself driven by two core dimensions (Audretsch et al., 2001; Casson, 1982). First, it is about *entrepreneurial*

acumen or capability – the ability to perceive a profit opportunity (Kirzner, 1973) as well as devise a means to exploit it (Sharma and Erramilli, 2004). This requires market information about the existence of a market gap, talent to make the leap from generating an idea for a service/product to satisfy the unmet consumer desire, and a vision/strategy to develop a new venture. Second, entrepreneurial performance depends on the ability to *acquire resources* so that a new venture has the capability to deliver the strategy. This typically requires resources such as technology; credibility (with suppliers and customers); consumer awareness (marketing and promotion); a sufficiently skilled and motivated team of people; premises; and finances. On this basis, writing a business plan can make a positive *impact* on new venture performance by increasing the capability to identify a business opportunity and devise a strategy to exploit it and/or secure resources to achieve these ends.

Bygrave and Zacharakis (2004) and Timmons (1999) argue that the development of an entrepreneurial idea alongside a sound execution strategy are the key means through which writing a business plan can enhance the performance of a new venture. They point out that most business plans require entrepreneurs to address various questions and employ analytical management techniques. This allows entrepreneurs to develop and test their business strategy and subject it to market research (Gruber, 2007). It is also likely to prompt entrepreneurs to adopt supposed performance enhancing systematic approaches to opportunity discovery such as those outlined by Fiet (2007). Delmar and Shane (2003) argue that through these types of exercises, business plans stimulate faster and better decision making because entrepreneurs will test their assumptions before expending valuable resources.

By contrast, Bhide (2000) argues that there are often more efficient uses of entrepreneurs' time than writing a business plan, particularly when there are new markets for novel products/services and it is difficult to accurately gauge customer demand unless one actually tries to sell to them. Bhide (2000) argues that in these circumstances business plans are a poor means of reducing uncertainty and entrepreneurs would secure more accurate information by undertaking a pilot launch. Eisenhardt and Tabrizi (1995) also argue that new product development is enhanced by taking an action based rather than a rational efficiency approach. Similarly, both McGrath (1995) and Carter et al. (1996) argue that new ventures would be better off prioritizing action and adopting improvisational learning techniques.

However, Bhide (2000) argues that the efficacy of written business plans is *context* specific: potentially likely to have a positive impact in more static and predictable/stable markets but less so in more uncertain markets where entrepreneurs are introducing highly innovative products/services. This view contrasts with Matthews and Scott (1995), Zollo and Winter (2002) and Winter (2003) who argue that business plans can highlight the difficulty of predicting market uncertainties and hence actually prime entrepreneurs to think and respond more effectively.

This discussion highlights that *contexts* and venture *profiles* influence the amount of information available to an entrepreneur and how a business plan might help increase this. So, for example, an entrepreneur that was previously unemployed may be assumed to be less informed about markets and industry practices/techniques than a person employed in the industry. So writing a business plan may be particularly beneficial to a

previously unemployed entrepreneur. Likewise, a novice entrepreneur may gain more benefit from writing a business plan than a serial entrepreneur. Similarly, a portfolio entrepreneur facing the challenge of juggling the complexity of the simultaneous involvement in different ventures may feel that the presence of a written business plan assists their focus and information when shifting their input from one venture to the next. So, there are good reasons to believe that the *impact* of business plans on venture performance may not be uniform across entrepreneurial profiles and contexts.

Impact Effects II: Increasing the Level of Resources Available to the Venture

The second main role of written business plans is to solve a problem of a lack of information for third parties; particularly banks (see Aldrich and Fiol, 1994; Berger and Udell, 1998; Fraser, 2005).[1] Such plans act as a communications and marketing document that informs and 'sells' the venture's vision and strategy to financiers. Storey (1994), Evans and Jovanovic (1989), Burke et al. (2000), and Haber and Reichel (2007) all argue that a lack of resources is one of the main obstacles to venture start-up and growth. At the heart of this resource constrained view is the problem of asymmetric information (Cressy, 1996; Stiglitz and Weiss, 1981) where resource providers know less about the business than the entrepreneur and face higher uncertainty. Business plans, therefore, have become a major means through which financiers try to become better informed in order to be able to make a commercially valid assessment of the risk/reward profile of any particular venture. In this case, business plans provide a *screening* function for financiers.

Overall, written business plans can make a positive *impact* on venture performance in two ways: (1) improving the venture's entrepreneurial capability; and (2) increasing the level of resources available to the venture. In contrast, we noted above that there is research which argues that business planning may in fact worsen vision, strategy, and method of execution by diverting time away from more productive endeavours.

However, prior to isolating the *impact* effect of writing a business plan on venture performance (Hypothesis 1 below), there is the potential for a spurious correlation between writing a business plan and new venture performance caused by a *selection* effect – namely, where the pre-plan capability, ambition, context, and hence performance of ventures with a propensity to write business plans systematically differs from those who do not write business plans.

Selection Effect: The Relationship between Venture Type/Nature and the Correlation between Writing a Business Plan and New Venture Performance

Bhide (2000) highlights the causes of profile differences between entrepreneurs that do and do not write business plans. He notes that it is difficult to gauge which group is likely to have the more able entrepreneurial profile. On the one hand, more able entrepreneurs may feel that writing a business plan is a poor use of time since they can effectively convince financiers like banks to invest in their venture without a business plan. Likewise,

they may be able to devise an effective vision, strategy, and method of implementation for their venture without having to write a business plan. In fact, Haynie et al. (2009), argue that entrepreneurs select opportunities which are closely related to their own human capital. If these were the only considerations, then those without a business plan could have a more promising performance profile.

But Bhide (2000) also points out that more ambitious and complex ventures with rapid growth potential may benefit from a written plan at start-up. Similarly, higher ability entrepreneurs may find writing a business plan easier to do and hence require less time (and external support) to write a business plan. Both of these factors could give rise to a situation where the profile of ventures with a business plan has higher growth potential then those without.

Screening by resource providers may also affect the profile of the types of businesses. Banks are the most common source of external funding. Given that they prefer low risk ventures, they screen ventures in order to distinguish between high and low risk borrowers so that the profile of ventures who borrow from banks is likely to be of lower risk (Parker, 2003). If business plans are an effective means of enabling banks to screen ventures in order to select less risky borrowers then this selection process may cause performance differences among ventures.

We also know that entrepreneurs with higher levels of wealth are less likely to face liquidity constraints (e.g. Burke et al., 2000; Evans and Jovanovic, 1989). Burke and Hanley (2003, 2006) also show that entrepreneurial risk propensities are affected by wealth levels and that banks appear to alter interest rate margins in response to variations in wealth and the risk profiles of entrepreneurs. Since business plans are frequently used to attract resources at start-up, higher wealth individuals might be less likely to select to write a business plan since they are less likely to require external finance. As a result another selection effect emerges where the risk taking propensity of ventures with business plans may systematically differ from those without.

Therefore, to estimate the impact of business plans on new venture performance, there is a need to ensure that *selection effects* do not get mixed up and mistaken for *impact effects*. This leads us to our two hypotheses. In the first hypothesis, we test whether (after controlling for selection effects) there is a positive *impact* of writing a business plan on new venture performance.

Hypothesis 1: Controlling for selection effects, a written business plan has a positive effect on new venture performance.

A central argument of our analysis is that the impact effect described in Hypothesis 1 will vary depending on the profile of the venture and its business context. It is also the case that any *selection* effect is unlikely to be uniform across different contexts as the profile of ventures who select to write a business plan is, itself, likely to differ. For example, a venture with a business plan written in order to raise bank finance (from risk averse lenders) is likely to have a somewhat different profile compared to a venture writing a business plan in order to devise a strategy for an innovative and highly risky venture in a new industry. In other words, venture/entrepreneur profile differences affect both selection and impact effects. As we observed above, aspects such as previously being

unemployed, as well as being a novice, serial, and portfolio entrepreneur are all likely to have a bearing on the magnitude and direction of impact and selection effects. Therefore, the question is not whether business plans have a positive effect on new venture performance or not, but 'In which business contexts and for which types of ventures are business plans most (and least) effective?' As a result, our second and final hypothesis states:

Hypothesis 2: The scale and direction (positive or negative) of the selection and impact effects of writing a business plan on new venture performance are likely to be affected by the profile of the venture and the context in which business plans are written.

We summarize our discussion with reference to Figure 1. Starting at the left of the figure, it shows that ventures select between writing or not writing business plans based on their profile and business context. The top arrow represents ventures who have selected to write business plans while the bottom those who have not. The resulting venture performance, on the right of the figure, depends on the presence/absence of a written business plan and the underlying profile and context of the venture. Indeed, the difference in performance between ventures with written business plans compared to those without written business plans (the total business plans effect: TBPE) is comprised of both the real *impact* of writing a business plan and the *selection* effect due to systematic
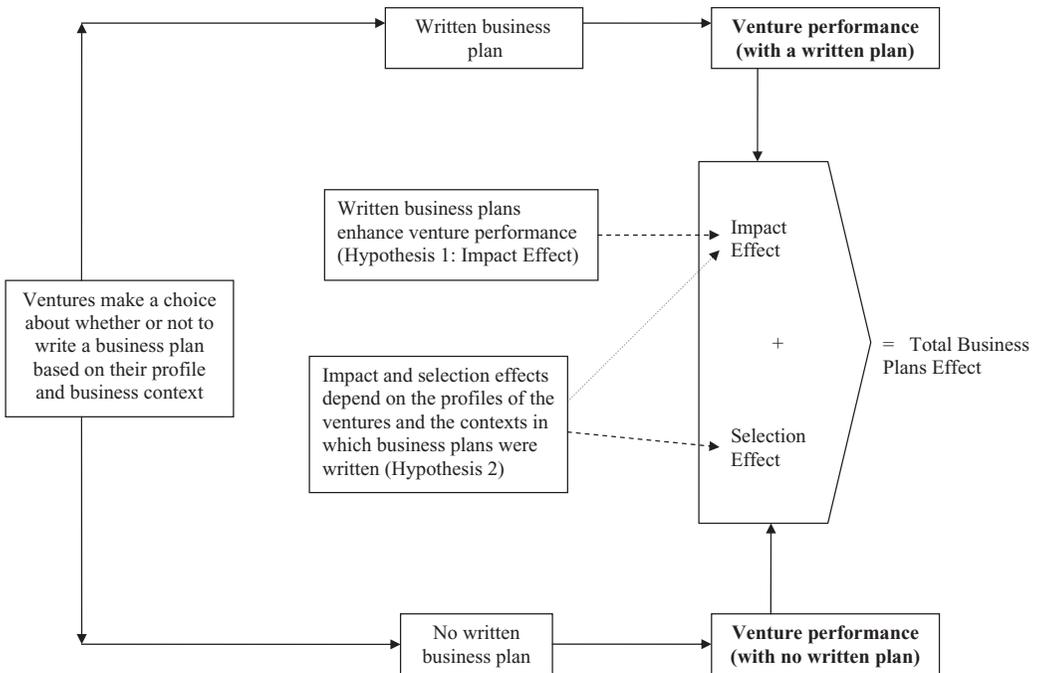
Figure 1. The relationship between business plans and new venture performance

Note: The TBPE is the difference in average venture performances between businesses with plans and those without plans. This TBPE can be decomposed into selection and impact effects as shown in the Appendix.

differences between the profile and contexts of ventures with/without written plans. Hypothesis 1 points to written business plans having a positive impact effect on new venture performance after controlling for selection effects. Hypothesis 2 indicates that selection and impact effects depend on venture profiles and business contexts.

METHODOLOGY

Sample and Design

There were two principal purposes underlying the construction and design of our study. First, we were interested in identifying *de novo* ventures rather than those that appeared to be 'new'. This is a common problem given the paucity of information about new ventures due to their novelty (Dess and Robinson, 1984; Sapienza et al., 1988), or the biased/unreliable nature of datasets (Birley et al., 1995). To resolve this common problem, and specifically focus upon *de novo* ventures, we sourced the sample from publicly available county British Telecom 'White Pages' for the year 2000.[2] We then compared these lists with venture lists – again derived from the same data source and for the identical geographic areas – for the year 1995. We then cross-checked 2000 venture entries with that of 1995 entries to see if they had appeared in the 2000 but not in the 1995 telephone directory. If so, we provisionally identified them as new ventures. This approach has the advantage of being more likely to capture new ventures missed in official statistics but is also likely to include ventures that were not, in fact, *de novo*.[3]

Our second focus was to ensure that our results could be generalized. Like other countries, England has wide regional disparities in its start-up rates (VAT registrations). These differences are pronounced. In the South East, the start-up rate is around 55 VAT registrations per 10,000 of the adult population. In the Midlands, this rate is around 35, whilst in the North East it is around 20. These regional disparities are long standing (Storey, 1982). To reflect these differences, our study focused on three specimen English counties with differing entrepreneurial outcomes. The first of these was Cleveland which has remained a low start-up area (measured by official statistics on the rate of start-ups) for more than 30 years. Building upon prior research which shows this (e.g. Storey, 1982; Storey and Strange, 1993), we contrast this county with one with an 'average' start-up rate (Shropshire) and a county with a high rate of start-up activity (Buckinghamshire). Interviews with entrepreneurs in each of these three counties took place in 2001 and attracted a response rate ranging from 45 per cent in Cleveland to 75 per cent in Shropshire (see Greene et al., 2004).

Econometric Model

The empirical analysis uses a regression model with endogenous switching (Maddala and Nelson, 1975). In analytical terms, the model is a simultaneous system of equations that explicitly accounts for the decision to write a business plan and the correlation between the error terms (which measure unobservable profiles) in the plan's decision and performance equations. In this manner, the model yields an estimate of the TBPE (see Figure 1) which is free from selection bias. This means that the TBPE is unbiased by systematic

variations in *unobservable* profiles, such as entrepreneurial capability and motivation, between those that write or do not write plans. This total effect can then be decomposed into its constituent selection and impact effects for the purposes of testing the hypotheses (see the Appendix for an explanation of the maximum likelihood techniques used to estimate the model and derivation of the total business plans, impact and selection effects).

Dependent Variables

Performance is estimated simultaneously with a selection equation for the decision to write a business plan (to control for selection bias/differences in unobservable profiles) in the model. Accordingly, there are two dependent variables – the performance measure (growth), and a binary variable for whether or not the venture had a business plan prior to start-up (this latter variable is derived from a question which asks: 'Prior to the business starting, did you have a formal written business plan?' (yes = 1, no = 0).

Growth effects are estimated by regressing the natural log of employment in 2001 on the natural log of initial size and the other explanatory variables.[4] The derivation of the effects of plans on employment growth is described in detail in the Appendix. The widespread use of employment growth as a measure of venture performance has been well documented (see Johnson, 2007; Parker, 2004). As an input to production, employment growth is positively related to revenue growth and hence is a useful proxy of venture performance (especially when one controls for venture size as we have done in this analysis). Employment growth also indicates the success of ventures in securing necessary resources to meet greater volumes of business (Box et al., 1994; Bruderl and Preisendorfer, 2000; Bruton and Rubanik, 2002). Its main advantage over other measures of venture growth such as sales and profits is both its reliability (Fraser et al., 2007) and availability due to the information being less sensitive from a commercial perspective (Cooper et al., 1994).

Explanatory Variables

In this section, we set out the particular variables in our dataset that we include in profiles and business contexts, and their expected relationships with decisions to write business plans and performance.

Venture profiles. The dominant element of these profiles relates to entrepreneurial capability. Whilst capability is largely an unobservable profile, our dataset includes some variables which are related to capability and the human capital of the entrepreneur. One of these is whether the entrepreneur is a novice, serial, or portfolio entrepreneur (Westhead and Wright, 1998), measured by 'Had you been in business before as an owner?' (yes = 1, no = 0) (serial entrepreneur), and 'Is the Founder currently a Director or Owner of any business other than this one?' (yes = 1, no = 0) (portfolio entrepreneur). We expect that serial entrepreneurs may derive less benefit from business plans since they are able to draw from their previous experience. Conversely, a portfolio entrepreneur may feel that the presence of a written business plan is beneficial when optimizing

their time/input across ventures. A more general measure of the human capital of the entrepreneur is previous unemployment ('Were you unemployed immediately prior to establishing this business?'; yes = 1, no = 0) which, in keeping with Honig and Karlsson (2004) and Vivarelli (2004), we take as an indicator of low human capital. Also, higher education is measured (degree: yes = 1, no = 0; Burke et al., 2000). Based on our earlier discussion, we expect the benefits of writing business plans to be greater for entrepreneurs with low human capital (implying a positive relationship between previous unemployment and decisions to write business plans). We also anticipate, following on from Cressy (1996), that the effects of human capital on venture performance are likely to be unambiguously positive. We also measure gender: Cooper et al. (1994) suggest that males are more likely to start growth orientated ventures.

Two measures which are related specifically to the costs of writing business plans are whether the venture kept financial records electronically (e-records: yes = 1; no = 0) and if there was a bookkeeper/accountant (own accountant: yes = 1; no = 0). These variables are included in the business plans equation but excluded *a priori* from the performance equation because we expect that such factors reduce the costs (and increase the likelihood) of writing business plans but have no direct effect on performance. In technical terms these exclusions help to identify the effects of business plans on performance (see the Appendix).

Contexts. We control for sectors through a series of dummies (construction, distribution, manufacturing, non-retail/professional services). These dummies capture variations in labour and capital intensity which may affect decisions to write business plans through the need to attract resources. Sectors may also have a role in measuring contexts of varying market uncertainty. We also control for the legal form of the venture (limited company, partnership, and sole proprietorship).

We account for external financial requirements with 'used bank finance at start-up', expecting the use of bank finance/external capital demands to increase the likelihood of the venture writing a business plan.[5] The use of bank finance is also included in the performance equations since ventures with access to capital are less likely to be under-capitalized and hence more likely to grow faster than those without such access.

We also examine contexts where the venture introduced new products/services. On the one hand, the introduction of new products/services may be associated with greater market uncertainty which cannot be reduced by business plans (suggesting a negative relationship with decisions to write business plans). On the other hand, plans may increase the agility of the venture in these contexts and so be beneficial (suggesting a positive relationship). The introduction of new products/services would also be expected to improve venture performance (see Freel and Robson, 2004).

Another important context is where the venture used external support at start-up. Chrisman and McMullan (2000) provide evidence that external support is a key asset. We asked entrepreneurs if they have used any external support prior to commencing their venture (yes = 1, no = 0). We would expect the use of external support to reduce the costs of writing business plans and increase the likelihood that the venture has a business plan. External support may also help to improve venture performance (Chrisman and McMullan, 2000; Mole et al., 2008).

Our study also examines three specimen regions using dummies: a 'high' start-up area (Buckinghamshire); an 'average' area (Shropshire); and a 'low' start-up area (Cleveland). Although there is no specific research that has looked at how business plans are used at a regional level, our base anticipation is that the writing of a business plan will be regionally invariant. However, there is plenty of evidence to suggest that venture performance is influenced by geographic location (Acs and Armington, 2004; Reynolds et al., 1994), so we would expect stronger employment growth in regions with higher start-up rates. We also control for the macroeconomic context at venture creation through vintage (age) dummies.

RESULTS

The results section is organized in the following manner. Table I provides summary statistics and simple bivariate correlations of the variables. Table II presents marginal effects estimates of the determinants of decisions to write business plans, and subsequent performance (i.e. growth: log size in 2001 conditional on log initial size).[6] Finally, in Table III, the estimates of the total business plans effect (TBPE) on employment growth, and decompositions of the TBPE into selection and impact effects, are reported for the average venture profile/contexts and for specific profiles/contexts. The results in Table III are central to the testing of our two hypotheses.

Table I shows that 56 per cent of the entrepreneurs wrote a formal business plan prior to starting their venture; that the average log size at start-up was 0.75 (with an average start-up size of 2.88 employees); and that the average log size in 2001 was 1.27 (with an average size in 2001 of 6.07 employees).

The first column of Table II shows that ventures with electronic financial records (e-records) and new ventures with their own accountant are more likely to have written business plans (by 9.6 and 8.7 percentage points, respectively). This suggests that being able to use financial spreadsheets and having access to internal financial advice make it easier/less costly for entrepreneurs to write business plans. Also, previously unemployed entrepreneurs are more likely to write business plans, by 11.1 percentage points, compared to those who were not unemployed, suggesting low human capital individuals derive greater benefits from writing business plans. Ventures which used external support at start-up are over 37 percentage points more likely to have a written business plan, suggesting that the costs of writing business plans are lower for this group. Similarly, ventures which brought new products to market are 13.6 percentage points more likely to have a written business plan, pointing to higher benefits from plans for this group despite the uncertain context. Finally ventures located in Cleveland, an area of low entrepreneurship, are 23.4 percentage points more likely to have written business plans than those located in either Shropshire or Buckinghamshire.

Looking at columns 2 and 3 of Table II, the main determinant of size in 2001 (columns 2 and 3) is initial size. A 1 per cent increase in start-up size is associated with a 0.86 per cent larger size in 2001, in the presence of a business plan, but the corresponding effect, in the absence of a business plan, is only 0.63 per cent. This implies that, given the same initial size, firms with written plans grew faster than those without. Other important

Table I. Summary statistics and bivariate correlations

Variable	Obs	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Business planning	613	0.56	0.50	1											
2. Log of initial size	490	0.75	0.70	0.0545	1										
3. 1st yr finance problems	622	0.29	0.45	−0.0222	−0.0053	1									
4. Log of current size	622	1.27	0.93	−0.0025	0.6453*	0.0353	1								
5. Serial entrepreneur	618	0.35	0.48	−0.0968*	0.0546	0.0165	0.0465	1							
6. Portfolio entrepreneur	597	0.21	0.40	−0.0403	0.0208	0.0312	0.0595	0.2279*	1						
7. Male	622	0.77	0.42	−0.015	0.0328	0.0772	0.0896*	0.0228	0.0477	1					
8. Unemployed	617	0.23	0.42	0.1113*	−0.1597*	0.0409	−0.1135*	−0.0599	0.0568	0.0513	1				
9. Degree	620	0.18	0.39	0.01	−0.0396	−0.02	−0.0102	−0.0283	0.0827*	0.0514	0.0155	1			
10. Internal accountant	622	0.24	0.43	0.056	0.1139*	0.0838*	0.1769*	0.0105	−0.0122	0.1328*	−0.0546	0.0793*	1		
11. E-records	622	0.70	0.46	0.0836*	0.1683*	0.0703	0.1950*	0.0245	0.1328*	0.0875*	0.0062	0.1547*	0.0946*	1	
12. Use of external support	622	0.88	0.32	0.2154*	0.0097	0.0898*	0.0122	−0.1299*	−0.0248	0.0398	0.0679	0.0935*	0.0911*	0.1027*	1
13. Use of personal savings at start	622	0.78	0.41	−0.0389	−0.0763	−0.0056	−0.0148	0.0029	−0.0265	0.0079	0.0298	0.0003	0.012	0.0619	−0.1080*
14. Use of bank finance at start-up	622	0.27	0.44	0.2429*	0.1152*	0.0224	0.0961*	−0.0685	−0.0371	−0.0075	0.0636	−0.025	0.0358	0.0723	0.0633
15. Use of personal savings in last year	622	0.17	0.37	−0.0008	0.0291	0.0755	−0.0423	−0.0288	0.0853*	0.0373	−0.0102	−0.0108	0.0269	0.0178	0.033
16. Use of bank finance in last year	622	0.34	0.47	0.0621	0.0751	0.1798*	0.1464*	−0.029	−0.0018	0.0836*	−0.0081	0.0288	0.0426	0.0799*	0.0838*
17. New product/ services	622	0.60	0.49	0.1030*	0.08	0.1120*	0.1457*	−0.0141	0.0189	−0.0187	−0.0335	0.1737*	0.1639*	0.1162*	0.1090*
18. Manufacturing	622	0.17	0.38	0.0479	0.1086*	0.0725	0.0286	0.0258	−0.0044	0.0293	0.0206	0.0451	0.0444	0.0763	0.0477
19. Construction	622	0.09	0.29	0.0466	0.0322	0.0121	0.0880*	0.063	−0.0451	0.1023*	0.06	−0.0456	0.0459	0.0124	−0.0059
20. Business services	622	0.24	0.43	−0.0262	−0.0548	−0.0349	−0.0013	−0.029	0.022	0.1076*	0.0335	0.1948*	0.0753	0.1458*	0.0575
21. Distribution	622	0.24	0.43	−0.1144*	−0.0681	−0.0124	−0.0605	−0.0187	−0.0124	0.0377	0.0065	−0.1117*	−0.1369*	−0.1612*	−0.1146*
22. Age of business	622	4.28	2.44	−0.1069*	−0.1030*	−0.0354	0.0675	−0.0154	−0.0074	0.0375	−0.0361	0.0325	0.0671	−0.0039	0.0213
23. Limited co.	621	0.36	0.48	0.0007	0.1868*	0.0792*	0.3031*	0.0257	0.0331	0.1998*	−0.0513	0.1244*	0.1227*	0.2212*	0.0865*
24. Partnership	622	0.17	0.38	−0.0413	0.1266*	−0.0179	0.0433	0.0275	0.0108	−0.0578	0.0056	0.0165	−0.0104	−0.0109	−0.0544
25. Sole trader	622	0.45	0.50	0.0288	−0.2766*	−0.0847*	−0.3333*	−0.0403	−0.0417	−0.1254*	0.0382	−0.1199*	−0.1155*	−0.2195*	−0.038
26. Cleveland	622	0.51	0.50	0.1092*	−0.0287	−0.1678*	−0.0123	−0.1086*	−0.1036*	−0.0691	−0.001	−0.1730*	−0.1366*	−0.1452*	−0.2179*
27. Shropshire	622	0.24	0.43	−0.0133	0.0924*	0.1891*	0.0478	0.1005*	0.0513	0.0178	−0.0345	0.0754	0.0928*	0.0643	0.1386*
28. Buckinghamshire	622	0.24	0.43	−0.1139*	−0.0568	0.0065	−0.0335	0.0263	0.0699	0.0627	0.0356	0.1263*	0.0665	0.1050*	0.1154*

* p < 0.05.

factors include the large negative effect of contact with a support agency at start-up on current size in the *absence* of business plans (conditional on start-up size) – which implies that, amongst users of external support, those with written business plans grew faster. Another significant effect comes from bringing a new product/service to market which is associated with a 34 per cent larger size in 2001 (controlling for initial size) when accompanied with a written business plan (with no corresponding effect in the absence of a written business plan). Again, this points to higher growth amongst the ventures in this group which wrote business plans.

13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.
1															
−0.1103*	1														
0.1213*	−0.0277	1													
−0.0311	0.2564*	−0.0858*	1												
−0.008	0.0392	0.0836*	0.0908*	1											
−0.0017	−0.0012	0.0469	0.011	−0.0094	1										
0.0009	−0.0491	−0.0368	0.0367	−0.0098	−0.1426*	1									
−0.0134	−0.0345	0.0251	−0.0236	0.0899*	−0.2566*	−0.1781*	1								
−0.0114	0.0142	0.0034	−0.0263	−0.0986*	−0.2578*	−0.1789*	−0.3220*	1							
−0.0336	0.0125	−0.1040*	0.046	0.0999*	−0.0602	0.045	0.0373	0.0199	1						
0.0302	0.0174	0.0236	0.0303	0.1045*	0.0204	0.0830*	0.2485*	−0.1885*	0.0306	1					
−0.0695	−0.0351	0.0087	−0.0131	−0.0025	0.0519	0.0041	−0.0814*	0.0159	0.0142	−0.3411*	1				
0.0401	0.0219	−0.0354	−0.0013	−0.1101*	−0.0735	−0.0691	−0.1789*	0.1792*	−0.0453	−0.6714*	−0.4134*	1			
0.0934*	0.1028*	−0.0088	0.0201	−0.1345*	−0.0559	−0.0316	−0.2002*	0.1108*	−0.0601	−0.2549*	0.0207	0.2294*	1		
−0.0134	−0.0514	−0.055	−0.0316	0.0592	0.0725	−0.0078	0.0992*	−0.0777	−0.0335	0.1902*	−0.0121	−0.1638*	−0.5828*	1	
−0.0955*	−0.0684	0.0652	0.0081	0.0975*	−0.0073	0.0446	0.1342*	−0.0515	0.1035*	0.1070*	−0.0121	−0.1035*	−0.5828*	−0.3206*	1

Table III reports the TBPE on employment growth and decompositions of the TBPE into impact and selection effects. These decompositions are reported for both the average entrepreneur/venture profile (as summarized in Table I) and for specific profiles and business contexts.

The results in the first row of Table III show that, for the average venture profile, business plans are associated with higher annual average growth (TBPE = 23.4 percentage points). The decomposition of this TBPE into a selection and impact effect reveals that the impact effect of business plans on growth is 33.4 percentage points, which

Table II. Log number of employees in 2001

	Decision to write a business plan (selection)	(Log) size in 2001 (with plan)	(Log) size in 2001 (without plan)
Venture/entrepreneur profile			
Serial entrepreneur	−0.069 (0.214)	−0.029 (0.748)	0.222* (0.086)
Portfolio entrepreneur		0.141 (0.158)	−0.198 (0.102)
e-records	0.096** (0.037)		
Own accountant	0.087* (0.073)		
Male	−0.033 (0.597)	0.042 (0.668)	0.099 (0.502)
Previously unemployed	0.111* (0.061)	−0.082 (0.399)	−0.184 (0.236)
(Log) size at start-up		0.860*** (0.000)	0.630*** (0.000)
Manufacturing	0.001 (0.988)	−0.153 (0.279)	−0.074 (0.723)
Construction	0.039 (0.697)	−0.070 (0.657)	0.092 (0.715)
Professional	−0.134* (0.082)	−0.111 (0.407)	0.061 (0.733)
Distribution	−0.080 (0.290)	0.025 (0.840)	0.317* (0.069)
Limited company		0.404 (0.110)	−0.213 (0.496)
Sole trader		−0.003 (0.991)	−0.578* (0.054)
Partnership		0.207 (0.416)	−0.598** (0.049)
Context			
Used external support at start-up	0.375*** (0.000)	0.058 (0.815)	−0.619*** (0.001)
Use of bank start-up finance	0.363 (0.219)	−0.088 (0.904)	0.330 (0.785)
Bank finance used in the last year		−0.155 (0.163)	−0.067 (0.710)
Savings used in the last year		−0.176* (0.055)	0.068 (0.536)
New product/services	0.136** (0.048)	0.337*** (0.009)	−0.130 (0.406)
Cleveland	0.234*** (0.000)	0.100 (0.400)	−0.302** (0.039)
Vintage dummies (p-value)	0.126	0.012**	0.017**
Constant	−0.289** (0.025)	−0.209 (0.683)	0.466 (0.471)
		$\rho_{1\varepsilon} = 0.209$ (0.625)	$\rho_{0\varepsilon} = 0.955$*** (0.000)
		$\sigma_1^2 = 0.556$*** (0.000)	$\sigma_0^2 = 0.934$*** (0.000)

n = 422
Log-likelihood = −610.403
χ^2 (p-value) = 0.000

Notes: p-values in parentheses; *** , ** and * denote significance at the 1%, 5% and 10% levels respectively.
Bank finance used at start-up is instrumented with a dummy variable for bank finance used as the main source of finance in the last year (2000–01).

provides strong support for Hypothesis 1 (i.e. written business plans have a positive impact effect on new venture growth). Interestingly, the corresponding selection effect, at −10 percentage points, suggests that ventures with business plans have lower growth profiles than those without plans. This is consistent with less able entrepreneurs choosing to write business plans. However, the positive impact effect outweighs the negative selection effect (which is also true for all the other cases reported in Table III), suggesting that business plans may help less able entrepreneurs to catch up and surpass their abler counterparts without plans.

The remainder of Table III shows that impact and selection effects vary depending on the venture profile/context for writing business plans: impact effects range from 42 percentage points for portfolio entrepreneurs to 21.6 percentage points for users of bank

Table III. Decompositions of total business plans effects (TBPE) into impact and selection effects

	Impact effect	Selection effect	TBPE
Average annual growth between start-up and 2001	33.4% points (0.000)	−10.0% points (0.000)	23.4% points (0.000)
Used bank start-up finance	21.6% points (0.000)	−9.7% points (0.000)	11.9% points (0.000)
New products/services	35.1% points (0.000)	−9.5% points (0.000)	25.6% points (0.000)
Previously unemployed	36.0% points (0.000)	−9.7% points (0.000)	26.3% points (0.000)
Male	33.0% points (0.000)	−10.0% points (0.000)	22.9% points (0.000)
Serial entrepreneur	27.8% points (0.000)	−9.0% points (0.000)	18.8% points (0.000)
Portfolio entrepreneur	42.0% points (0.000)	−10.0% points (0.000)	32.0% points (0.000)
Used external support at start-up	34.1% points (0.000)	−7.3% points (0.002)	26.8% points (0.000)
Cleveland	39.1% points (0.000)	−8.5% points (0.001)	30.6% points (0.000)
Manufacturing	31.2% points (0.000)	−10.0% points (0.000)	21.2% points (0.000)
Construction	28.6% points (0.000)	−10.0% points (0.000)	18.6% points (0.000)
Professional	29.3% points (0.000)	−10.0% points (0.000)	19.4% points (0.000)
Distribution	25.7% points (0.000)	−9.0% points (0.000)	16.7% points (0.000)

Notes: p-values in parentheses.

finance; selection effects vary from −10 percentage points for male and portfolio entrepreneurs and for ventures in manufacturing, construction and professional sectors, to −7.3 percentage points for users of external support at start-up. Overall, these results support the contention set out in Hypothesis 2 that impact and selection effects vary depending on the context in which business plans were written.

Looking at some interesting specific instances, users of bank finance at start-up with plans have lower growth profiles than those without plans (selection effect = −9.7 percentage points). This is consistent with banks choosing (with the aid of information in business plans) to lend to lower risk/lower growth profile ventures. Nonetheless, plans have a positive impact effect (21.6 percentage points) for this group, suggesting that plans may also be beneficial for users of bank finance. It is also notable that, amongst previously unemployed entrepreneurs, despite those with plans having lower growth profiles (selection effect = −9.7 percentage points), the growth benefits from having business plans are large and positive (impact effect = 36.0 percentage points). This suggests there are benefits from encouraging/assisting disadvantaged entrepreneurs with writing business plans. Also, there is a large and positive impact effect (34.1 percentage points) for users of external support at start-up.[7]

DISCUSSION

Prior approaches have failed to adequately distinguish between *impact* and *selection* effects as well as overlooking the multiple effects of business plans. In other words, they ask the wrong question. In this paper, we extend the question from simply 'Do business plans have a positive effect on new venture performance?' to 'In which business contexts and for which venture profiles does writing a business plan have most (or least) effect on new venture performance?'

Our contribution has been to propose, develop, and test a model that jointly controls for endogeneity and interaction effects. Endogeneity (selection) is obviously important to control for because it reflects the choice of whether to write a business plan. This, in turn, is important because of the ongoing theoretical debate about the value of business plans to the performance of new ventures. Earlier on, we suggested that there was a great deal of ambiguity surrounding the contribution of written business plans to venture growth. These stem from different theoretical treatments about how entrepreneurial opportunities are discovered, evaluated, and exploited (Shane and Venkataraman, 2000). We contrasted more deliberative rational approaches with those that emphasized the importance of action and improvisation.

Our results point to the value of business plans. The key result is that ventures with written business plans grew faster than those without written plans, having controlled for selection effects. This supports Hypothesis 1 and suggests that business plans help raise entrepreneurial capabilities and, thereby, enhance performance.

We stress that our findings should not be over interpreted as a victory for deliberative planning over 'trial and error' or 'improvisational' strategies. As Bhide (2000) suggests, these two approaches are not mutually exclusive: entrepreneurs are not often faced by a 'plan' versus 'tacit learning' choice. Instead, we concur with Hmieleski and Corbett (2008) that '. . . new ventures almost always begin with a goal or vision of some form, implying an initial rational outlook . . .' (p. 483). A written business plan at start-up is an obvious initial expression of this goal or vision. However, as Bhide (2000), Mintzberg and Waters (1985), Zahra et al. (2006) and Hmieleski and Corbett (2008) all argue, the forging of entrepreneurial opportunities often requires entrepreneurs to improvise in response to external conditions and resource constraints: in short, they may need to change their plans. In this context, our findings indicate that a written business plan may actually support improvisational activities by enhancing entrepreneurial decision making.

One benefit of this paper is that it shows how a written business plan offers a key referential resource to assess and support the performance of the venture (Block and MacMillan, 1992) when profiles and contexts differ.

For instance, a written business plan appears important in enhancing entrepreneurial decision making when potentially more uncertain contexts such as the introduction of new product/services are considered. The argument here is that those introducing new products/services are doing something novel. In such situations, 'learning by doing' may be seen as being more conducive to growth because there is no ready guide to introducing such products/services. However, the results show that whilst those without written business plans in this context may have an initial advantage (selection effect = −9.5 percentage points), this was outweighed by the impact effect of business plans (35.1 percentage points). Our results are in line with Delmar and Shane (2003) who argued that written business plans have benefits in terms of improving the managerial capabilities to learn and introduce new routines.

Writing a business plan seems also to have positive impact effects for those with low human capital (the previously unemployed) and in low start-up areas like Cleveland. Arguably, from a 'learning by doing' or emergent approach, there is little advantage in the previously unemployed writing business plans because they will do little or nothing to

raise their entrepreneurial capabilities, particularly in Cleveland. Our results, though, suggest that writing a business plan appears to guide individuals with low human capital, even in low enterprise areas, to grow their venture.

Reinforcing such an interpretation is the role played by external support. Again, this shows the same pattern: those that write business plans and use external support are more likely to see their venture grow. It is also suggestive of an interpretation that sees business plans as a positive isomorphic pressure on ventures. At the start of this paper, we identified that Honig and Karlsson (2004) had queried the value of business plans. Their argument is that, in order to conform and homogenize with particular institutional arrangements (to 'act as if'), new ventures were coerced into writing a business plan. Our results indicate that if this is true this will generally be a good thing for new venture performance. In other words, whilst business plans appear to play a mimetic role, this discipline leads to our finding of a positive rather than negative outcome. Indeed, our results suggest that attempts by support providers to enhance the quality of new ventures through business plans – particularly for the previously unemployed and those in low enterprise areas – are efficacious. The implication, therefore, is that this support should be enhanced by policy makers if the aim is to see increased employment growth.

Overall, we find evidence of *impact* and *selection* effects that differ depending on the profile of the venture and its business context. However, throughout, this variation is in scale only as the consistent finding is that a written business plan improves employment growth in new ventures. We take these findings as indicative of the importance of a written business plan. By articulating goals and identifying strategies for exploiting entrepreneurial opportunities, written business plans appear to enhance entrepreneurial decision making even in situations where improvisation is important.

Limitations and Further Research Directions

This study provides an initial but important step in investigating the multi-channel effect of business plans on venture performance. Further research could usefully consider differing types of ventures (and at different stages of development), other geographical locations, and different external sources of finance. This may be particularly important because we have limited measures of uncertainty. Our two proxies – new products/services and sector dummies – may be judged to inadequately capture the different forms of uncertainty and risk which can challenge a growing venture. As Bhide (2000) argues, the ability of business plans to reduce uncertainty depends on what type of uncertainty a venture is facing. Further applications of our approach could, therefore, examine in greater granularity other measures of innovation and more precise measures of sector than those available in our data; especially as the methodology itself is designed to deal with differences in venture profiles and contexts.

Similarly, an advantage of our approach is that it permits renewed scrutiny of the ways in which *inter alia*, environmental munificence and dynamism influence the importance of business plans (Brews and Hunt, 1999; Fredrickson and Iaquinto, 1989; Fredrickson and Mitchell, 1984). Obviously, this suggests that the approach should be applied not just to new ventures but also to existing ventures. This may provide qualitatively different

results to ours in terms of the scale and direction of the importance of business plans, but nevertheless signals a more careful disentangling of the relationship between business plans and venture performance.

Indeed, we call for further replication and verification of our findings using differing individual performance outcome measures (e.g. sales, profitability, harvest/exit valuations) as well as more multi-dimensional approaches to performance (Delmar et al., 2003).

There is also a greater need to continue to untangle the process of planning from that of writing a business plan. Whilst our results point to a written business plan enhancing entrepreneurial decision making, we are unable to identify *how* it is that entrepreneurs use a plan to enhance venture performance. There is a need to identify qualitatively how entrepreneurs use their written business plan, how it acts as a key reference, and how it influences improvisational behaviour. Moreover, we use a dummy measure to identify the use of a written business plan. Although this is a common approach, there is a need to consider different gradations of business planning. For example, our focus has been on formal written business plans, but entrepreneurs may gain benefits from informal business plans which also articulate self-set goals and means of achieving these goals. This is important because, if the interest is in how entrepreneurs learn, there is a need to further understand the stimulus, development, and use of written business plans. There may, for instance, be differences in the quality of business plans. Unfortunately, we are unable to fully trace the relationships between means (planning processes) and ends (business plans) (Sarasvathy, 2001).

Furthermore, our data does not consider cognitive biases. For example, de Meza (2002) argues that what typifies entrepreneurs is their optimism (see also Fraser and Greene, 2006). If business plans are efficacious, then what role do they have in altering cognitive biases such as optimism? Fundamentally, what our approach and evidence points to is the need for more data and analysis that not only acknowledges the multi-channel reasons for writing business plans but explores how this is connected to written business plans.

CONCLUSIONS

In this paper, we propose, develop, and test the relationship between new venture performance and writing business plans. We propose that prior approaches produce an average effect that does not adequately control for endogeneity and interaction effects. We therefore develop a model that accounts for *selection* and *impact* effects where both of these vary depending on the profile and business context of the venture.

We subsequently test these relationships using *de novo* English ventures and find negative *selection* effects and stronger positive *impact* effects. In short, we find that written business plans promote employment growth. We also find that impact and selection effects differ across different types of venture profiles and their business contexts. Notably, we find that business plans are particularly helpful at increasing the growth performance of apparently lesser able entrepreneurs and for ventures launching a new product of service. Whilst acknowledging the limitations of our data, the paper opens up a new research trajectory whose aim is to better understand how writing a business plan

impacts on differing profiles and contexts under which plans are written. Therefore, we shift the research question from 'Does writing a business plan enhance new venture performance?' to 'After controlling for selection effects, does writing a business plan have an impact on venture performance and does this vary depending on the profile and business context of the venture?'

ACKNOWLEDGEMENTS

NOTES

[1] Data from the UK Survey of SME Finances (Fraser, 2005) indicate that, whilst non-market finance (owner's savings) was used by almost 70 per cent of start-ups, the main external source of finance was bank loans (20 per cent), with less than 1 per cent using venture capital. US data suggest that the owner was the main source of finance for new ventures (aged less than 2 years) in the form of equity (20 per cent) or debt (6 per cent) (Berger and Udell, 1998). However, as in the UK, the main external source of finance is bank loans (16 per cent), with only a very small percentage using venture capital (Berger and Udell, 1998). Additionally, there is no direct relationship between accessing bank finance and business plans in that banks do not always demand business plans prior to providing finance. In the UK, decisions on loans below around £25,000 usually involve credit scoring in which case a business plan may not be required. The average start-up amount in the UK is around £15,000 (Fraser, 2005). Hence, there may be an expectation (Honig and Karlsson, 2004) that new ventures will use business plans as a means of gaining bank finance but such finance may, in fact, be given without recourse to business plans.

[2] Whilst the British Telecom White pages directories are not a census of business activity, they do have the advantage of being common (they are typically called the 'phone book' in the UK).

[3] We therefore telephoned the entrepreneurs of these prospective 'new' ventures to establish that they met our specified criteria for a new venture: that they were new ventures, independent of outside control (not subsidiaries or part of larger enterprises), indigenous to the local area, non-retail, and still in operation, and were not a charity or other not-for-profit organization. From this process, the total population of wholly new ventures was identified. We then re-telephoned every third venture to arrange face-to-face interviews with the entrepreneurs given that many new ventures were likely also to be small; indeed, more than a third of our sample had no employees. Respondents answered a structured interview questionnaire, which was subjected to a pre-test in order to check for biased, misleading, or confusing questions. Prior to the questionnaire being administered, we again checked that the ventures met our criteria. The structured interview was administered at the normal place of work of the entrepreneur and took about an hour to complete.

[4] The number of employees includes the founder. This avoids problems with attempting to take the log of zero (i.e. minus infinity) in the log size model which would lead to a large number of observations (164) being dropped from the model. Nonetheless, this expedient does not affect the measurement of growth since clearly the founder is counted in both the initial and current size.

[5] However, the use of bank finance at start-up is clearly endogenous since business plans increase the likelihood of receiving bank finance. Accordingly we instrument this variable with the use of bank finance in the year before the survey (i.e. in 2000–01); in fact, we find that this measure is highly correlated with the use of bank finance at start-up (see Table I) but is uncorrelated with the error term in the business plans equation, suggesting that the instrument is valid.

[6] Starting with a general model, which included all the explanatory variables in the business plans and performance equations (with the exception of the variables excluded from the performance equation for the purpose of identification) we tested down to derive a parsimonious model which is reported in Table II; this methodology is the 'general to specific' or the Hendry/LSE approach (see, e.g. Gilbert,

1986). The testing down approach involved dropping variables from the general equations which were insignificant at the 10 per cent level (p > 0.10). The key benefit of parsimony in this context is that dropping irrelevant variables increases the precision/statistical significance of the estimated effects of the remaining variables and of the resulting plans effects.

[7] We also carried out two robustness checks on the results. First, we checked the validity of the start-up bank finance instrument in the plans equation (i.e. use of bank finance in 2000–01) by testing it for correlation with the disturbance term in the plans equation: for the instrument to be valid it should be uncorrelated with this disturbance term. This check was achieved by estimating a bivariate probit model for the bank finance instrument and business plans decisions and testing the correlation coefficient of the disturbances (ρ). The test of $\rho = 0$ had a p-value of 0.75 so we cannot reject the hypothesis that the correlation between the instrument and plans disturbance is zero. Second, the results may also be biased by the potential endogeneity of other explanatory variables. In particular, the variables 'Used External Support at Start-up' and 'New Products/Services' might raise some suspicions of endogeneity. We therefore re-estimated the models *excluding* these variables and examined the impact this had on the estimated plans effects. However, there was little change from the initial results, suggesting that the results are robust to potential endogeneity from other sources (the results from this analysis are available on request).

APPENDIX: BUSINESS PLANS MODEL

The endogenous switching regression model has the following analytical form:

$$bp_i^* = Z_i\gamma - \varepsilon_i$$
$$y_{1i}^* = X_{1i}\beta_1 + u_{1i} \Leftrightarrow bp_i^* > 0$$
$$y_{0i}^* = X_{0i}\beta_0 + u_{0i} \Leftrightarrow bp_i^* \leq 0,$$
$$(\varepsilon, u_1, u_0)' \sim \mathcal{N}(0, \Sigma),$$

where: bp^* represents the firm's latent utility from business plans (only those businesses with a positive latent utility – i.e. those for whom the benefits of plans exceed the costs – write business plans); y_1^* represents performance with a business plan and y_0^* represents performance without a business plan; and Z (resp. X) is a row vector of determinants of business plans (resp. performance). The residual terms (ε u_1 u_0) capture the effects of unobserved variables, e.g. entrepreneurial capability and motivation, on plans decisions and performances. The residual variance–covariance matrix is given by:

$$\Sigma = \begin{bmatrix} 1 & \rho_{1\varepsilon}\sigma_1 & \rho_{0\varepsilon}\sigma_1 \\ \rho_{1\varepsilon}\sigma_1 & \sigma_1 & \rho_{10}\sigma_1\sigma_0 \\ \rho_{0\varepsilon}\sigma_1 & \rho_{10}\sigma_1\sigma_0 & \sigma_0 \end{bmatrix}.$$

The parameters $\rho_{1\varepsilon}$ (resp. $\rho_{0\varepsilon}$) measure the correlation between unobserved effects in the equations for plans decisions and performance with (resp. without) a business plan. These correlations capture the endogeneity of decisions to write/not write business plans in the firm's subsequent performance. In the instance of exogenous switching these correlations are zero. The variables in Z and X may overlap but typically the selection

equation will include variables, which do not appear in performances, for the purposes of identifying the performance equations.

The assumption of normality is made to facilitate estimation of the model by maximum likelihood. For a continuous performance measure this likelihood is given by:

$$L = \prod_{bp_i=1} \frac{1}{\sigma_1} \phi\left(\frac{y_{1i} - X_{1i}\beta_1}{\sigma_1} \right) \Phi\left(\frac{Z_i\gamma + (y_{1i} - X_{1i}\beta_1)\rho_{1\varepsilon}/\sigma_1}{\sqrt{1-\rho_{1\varepsilon}^2}} \right)$$

$$\times \prod_{bp_i=0} \frac{1}{\sigma_0} \phi\left(\frac{y_{0i} - X_{0i}\beta_0}{\sigma_0} \right) \Phi\left(\frac{-Z_i\gamma - (y_{0i} - X_{0i}\beta_0)\rho_{0\varepsilon}/\sigma_0}{\sqrt{1-\rho_{0\varepsilon}^2}} \right)$$

where ϕ and Φ are the standard normal density and cumulative distribution functions respectively.

Total Business Plans Effects (TBPE), Impact Effects and Selection Effects

The total plans effect (TBPE) (referred to in the treatment effects literature as the average treatment effect) for firm i is given by $TBPE(X_i) = X_{1i}\beta_1 - X_{0i}\beta_0$. The TBPE may be decomposed as:

$$TBPE(X_i) = \underbrace{X_1(\beta_1 - \beta_0)}_{\text{Impact effect}} + \underbrace{(X_1 - X_0)\beta_0}_{\text{Selection effect}}.$$

The first term on the right-hand side represents the performance response to business plans $(\beta_1 - \beta_0)$ for businesses with the observed profile of a planner (X_1). This is the 'impact effect' which is the part of the TBPE caused by business plans itself. The second term on the right-hand side is the 'selection effect', which is the portion of the TBPE caused solely by differences between the observed profiles of planners and non-planners as given by $(X_1 - X_0)$. In this case the performance coefficients (which measure the response of performance to changes in the explanatory variables) are held at their non-plans levels (β_0).

Effects of Plans on Growth

The total business plans, impact, and selection effects on growth may be calculated directly from the estimates of the log size in 2001 (conditional on log start-up size) model. To see this, firstly write the equations for log size as follows:

$$\ln y_{1,2001} = \gamma_1 \ln y_{1,s} + X_1^* \beta_1^* + u_1$$

$$\ln y_{0,2001} = \gamma_0 \ln y_{0,s} + X_0^* \beta_0^* + u_0$$

where: $\ln y_{1,2001}(\ln y_{0,2001})$ is the natural log of size in 2001 amongst planners (resp. non-planners); $\ln y_{1,s}(\ln y_{0,s})$ is the natural log of size in the start-up year $(t = s)$ amongst planners (resp. non-planners); and $X_1^*\left(X_0^*\right)$ is a row vector of the other explanatory variables in the performance equation for planners (resp. non-planners). Simply rewriting these equations, to make changes in log size between start-up and 2001 the dependent variable (which approximates relative changes in size over these periods), gives

$$\Delta \ln y_{1,2001} = (\gamma_1 - 1)\ln y_{1,s} + X_1^* \beta_1^* + u_1$$

$$\Delta \ln y_{0,2001} = (\gamma_0 - 1)\ln y_{0,s} + X_0^* \beta_0^* + u_0$$

where $\Delta \ln y_{j,2001} = \ln y_{j,2001} - \ln y_{j,s} \cong (y_{j,2001} - y_{j,s}) / y_{j,s}$, $j = 0,1$. The total business plans, impact and selection effects, on relative changes in size, can then be calculated, using the decomposition of the TBPE reported in the previous section, with

$$X_j \equiv \left(\ln y_{j,s} \ \ X_j^*\right), \ \beta_j \equiv \begin{pmatrix} \gamma_j - 1 \\ \beta_j^* \end{pmatrix}, \ j = 0,1.$$

The effects of plans on growth rates are simply the effects on relative size changes $\times$ 100 (the growth rates are measured on a percentage scale so the effects on growth are measured in percentage points). Finally, dividing the (firm level) growth effects, by the business age (in 2001) in years, yields estimates of the average annual effects.

REFERENCES

Acs, Z. J. and Armington, C. (2004). 'The impact of geographic differences in human capital on service firm formation rates'. *Journal of Urban Economics*, **56**, 244–78.

Aldrich, H. and Fiol, M. (1994). 'Fools rush in? The institutional context of industry creation'. *Academy of Management Review*, **19**, 645–70.

Audretsch, D. B., Baumol, W. B. and Burke, A. E. (2001). 'Competition policy in dynamic markets'. *International Journal of Industrial Organization*, **19**, 613–35.

Berger, A. N. and Udell, G. F. (1998). 'The economics of small business finance: the role of private equity and debt markets in the financial growth cycle'. *Journal of Banking and Finance*, **22**, 613–73.

Bhide, A. V. (2000). *The Origin and Evolution of New Businesses*. New York: Oxford University Press.

Birley, S., Muzyka, D., Dove, C. and Russel, G. (1995). 'Finding the high-flying entrepreneurs: a cautionary tale'. *Entrepreneurship Theory and Practice*, **19**, 105–12.

Block, Z. and MacMillan, I. (1992). 'Milestones for successful venture planning'. In Sahlman, W. and Stevenson. H. (Eds), *The Entrepreneurial Venture*. Boston, MA: Harvard Business School Press, 138–48.

Box, T. M., Watts, L. R. and Hisrich, R. D. (1994). 'Manufacturing entrepreneurs: an empirical study of the correlates of employment growth in the Tulsa MSA and Rural East Texas'. *Journal of Business Venturing*, **9**, 261–70.

Boyd, B. (1991). 'Strategic planning and financial performance: a meta analytic review'. *Journal of Management Studies*, **28**, 353–74.

Brews, P. J. and Hunt, M. R. (1999). 'Learning to plan and planning to learn: resolving the planning school/learning school debate'. *Strategic Management Journal*, **20**, 889–913.

Bruderl, J. and Preisendorfer, P. (2000). 'Fast growing businesses: empirical evidence from a German study'. *International Journal of Sociology*, **30**, 45–70.

Bruton, G. D. and Rubanik, Y. (2002). 'Resources of the firm, Russian high-technology startups, and firm growth'. *Journal of Business Venturing*, **17**, 553–76.

Burke, A. E. and Hanley, A. (2003). 'How do banks pick safer ventures? A theory relating the importance of risk aversion and collateral to interest margins and credit rationing'. *Journal of Entrepreneurial Finance and Business Ventures*, **8**, 13–24.

Burke, A. E. and Hanley, A. (2006). 'Bank interest margins and business start-up collateral: testing for convexity'. *Scottish Journal of Political Economy*, **53**, 319–34.

Burke, A. E., FitzRoy, F. R. and Nolan, M. A. (2000). 'When less is more: distinguishing between entrepreneurial choice and performance'. *Oxford Bulletin of Economics and Statistics*, **62**, 565–87.

Bygrave, W. and Zacharakis, A. (2004). *The Portable MBA in Entrepreneurship*, 3rd edition. Hoboken, NJ: John Wiley.

Carter, N., Gartner, W. and Reynolds, P. (1996). 'Exploring startup event sequences'. *Journal of Business Venturing*, **11**, 151–66.

Casson, M. C. (1982). *The Entrepreneur: An Economic Theory*. Oxford: Martin Robinson.

Castrogiovanni, G. (1996). 'Pre-startup planning and the survival of new small businesses: theoretical linkages'. *Journal of Management*, **22**, 801–22.

Chrisman, J. J. and McMullan, W. E. (2000). 'A preliminary assessment of outsider assistance as a knowledge resource: the longer term impact of new venture counseling'. *Entrepreneurship Theory and Practice*, **24**, 37–53.

Cooper, A. C., Gimeno-Gascon, F. J. and Woo, C. Y. (1994). 'Initial human and financial capital as predictors of new venture performance'. *Journal of Business Venturing*, **9**, 371–95.

Cressy, R. (1996). 'Are start-ups debt rationed?'. *Economic Journal*, **106**, 1253–70.

Delmar, F. and Shane, S. (2003). 'Does business planning facilitate the development of new ventures?'. *Strategic Management Journal*, **24**, 1165–85.

Delmar, F., Davidsson, P. and Gartner, W. B. (2003). 'Arriving at the high-growth firm'. *Journal of Business Venturing*, **18**, 89–216.

de Meza, D. (2002). 'Overlending'. *Economic Journal*, **112**, 477, F17–31.

Dess, G. and Robinson, R. B. (1984). 'Measuring organizational performance in the absence of objective measures: the case of the privately held firm and conglomerate business unit'. *Strategic Management Journal*, **5**, 265–73.

Eisenhardt, K. M. and Tabrizi, B. N. (1995). 'Accelerating adaptive processes: product innovation in the global computer industry'. *Administrative Science Quarterly*, **40**, 84–110.

Evans, D. and Jovanovic, B. (1989). 'An estimated model of entrepreneurial choice under liquidity constraints'. *Journal of Political Economy*, **97**, 808–27.

Fiet, J. O. (2007). 'A prescriptive analysis of search and discovery'. *Journal of Management Studies*, **44**, 592–611.

Fraser, S. (2005). *Finance for Small and Medium Sized Enterprises: A Report on the 2004 UK Survey of SME Finances*. ESRC UK Data Archive: SN 5326.

Fraser, S. and Greene, F. J. (2006). 'The effects of experience on entrepreneurial optimism and uncertainty'. *Economica*, **73**, 169–92.

Fraser, S., Greene, F. J. and Mole, K. F. (2007). 'Systematic biases in self-reported data: the role of "anchoring" and "impression management"'. *British Journal of Management*, **18**, 192–208.

Fredrickson, J. W. and Iaquinto, A. L. (1989). 'Inertia and creeping rationality in strategic decision processes'. *Academy of Management Journal*, **32**, 543–76.

Fredrickson, J. W. and Mitchell, T. R. (1984). 'Strategic decision processes: comprehensiveness and performance in an industry with an unstable environment'. *Academy of Management Journal*, **27**, 399–423.

Freel, M. S. and Robson, P. J. A. (2004). 'Small firm innovation, growth and performance – evidence from Scotland and northern England'. *International Small Business Journal*, **22**, 561–75.

Gilbert, C. L. (1986). 'Professor Hendry's econometric methodology'. *Oxford Bulletin of Economics and Statistics*, **48**, 283–307.

Greene, F. J., Mole, K. and Storey, D. J. (2004). 'Does more mean worse? Three decades of enterprise policy in the Tees Valley'. *Urban Studies*, **41**, 1207–28.

Gruber, M. (2007). 'Uncovering the value of planning in new venture creation: a process and contingency perspective'. *Journal of Business Venturing*, **22**, 782–807.

Haber, S. and Reichel, A. (2007). 'The cumulative nature of the entrepreneurial process: the contribution of human capital, planning and environment resources to small venture performance'. *Journal of Business Venturing*, **22**, 119–45.

Haynie, J. M., Shepherd, D. and McMullen, J. S. (2009). 'An opportunity for me? The role of resources in opportunity evaluation decisions'. *Journal of Management Studies*, **46**, 337–61.

Heckman, J. (1979). 'Sample selection bias as a specification error'. *Econometrica*, **47**, 153–61.

Hmieleski, K. M. and Corbett, A. C. (2008). 'The contrasting interaction effects of improvisational behavior with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction'. *Journal of Business Venturing*, **23**, 482–96.

Honig, B. (2008). *Institutional Isomorphism and the Likelihood of Business Planning: The Moderating Effects of Environmental Uncertainty*. Babson Conference, USA.

Honig, B. and Karlsson, T. (2004). 'Institutional forces and the written business plan'. *Journal of Management*, **30**, 29–48.

Johnson, P. (2007). *The Economics of Small Firms*. Oxford: Routledge.

Kirzner, I. M. (1973). *Competition and Entrepreneurship*. Chicago, IL: University of Chicago Press.

Liao, J. and Gartner, W. B. (2006). 'The effects of pre-venture plan timing and perceived environmental uncertainty on the persistence of emerging firms'. *Small Business Economics*, **27**, 23–40.

Maddala, G. S. (1983). *Limited-dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.

Maddala, G. S. and Nelson, F. (1975). 'Switching regression models with exogenous and endogenous switching'. *Proceedings of the American Statistical Association* (Business and Economics Section), 423–6.

Matthews, C. H. and Scott, S. G. (1995). 'Uncertainty and planning in small and entrepreneurial firms: an empirical assessment'. *Journal of Small Business Management*, **33**, 34–52.

McGrath, R. G. (1995). 'Advantage from adversity – learning from disappointment in internal corporate ventures'. *Journal of Business Venturing*, **10**, 121–42.

Mintzberg, H. and Waters, J. A. (1985). 'Of strategies, deliberate and emergent'. *Strategic Management Journal*, **6**, 257–72.

Mole, K., Hart, M., Roper, S. and Saal, D. (2008). 'Differential gains from business link support and advice: a treatment effects approach'. *Environment and Planning C: Government and Policy*, **26**, 315–34.

Parker, S. C. (2003). 'Asymmetric information, occupational choice and government policy'. *Economic Journal*, **113**, 861–82.

Parker, S. C. (2004). *The Economics of Self-Employment and Entrepreneurship*. Cambridge: Cambridge University Press.

Perry, S. C. (2001). 'The relationship between written business plans and the failure of small businesses in the US'. *Journal of Small Business Management*, **39**, 201–8.

Reid, G. C. and Smith, J. A. (2000). 'What makes a new business start-up successful?'. *Small Business Economics*, **14**, 165–82.

Reynolds, P., Storey, D. J. and Westhead, P. (1994). 'Cross-national comparisons of the variation in new firm formation rates'. *Regional Studies*, **28**, 443–56.

Robinson, R. B. and Pearce, J. A. (1983). 'The impact of formalized strategic planning on financial performance in small organizations'. *Strategic Management Journal*, **4**, 197–207.

Robinson, R. B., Logan, J. E. and Salem, M. Y. (1986). 'Strategic versus operational planning in small retail firms'. *American Journal of Small Business*, **10**, 7–16.

Sapienza, H. J., Smith, K. G. and Gannon, M. J. (1988). 'Using subjective evaluations of organizational performance in small business research'. *American Journal of Small Business*, **12**, 45–53.

Sarasvathy, S. (2001). 'Causation and effectuation: towards a theoretical shift from economic inevitability to entrepreneurial contingency'. *Academy of Management Review*, **26**, 243–88.

Shane, S. and Venkataraman, S. (2000). 'The promise of entrepreneurship as a field of research'. *Academy of Management Review*, **25**, 217–26.

Sharma, V. M. and Erramilli, M. K. (2004). 'Resource-based explanation of entry mode choice'. *Journal of Marketing Theory and Practice*, **12**, 1–18.

Stiglitz, J. E. and Weiss, A. (1981). 'Credit rationing markets with imperfect information'. *American Economic Review*, **71**, 393–410.

Storey, D. J. (1982). *Entrepreneurship and the New Firm*. London: Croom Helm.

Storey, D. J. (1994). *Understanding the Small Business Sector*. London: Thomson.

Storey, D. J. and Strange, A. (1993). *Entrepreneurship in Cleveland 1979–1989: A Study of the Effects of the Enterprise Culture*. Employment Department Research Series, No. 3. London: Employment Department.

Timmons, J. A. (1999). *New Venture Creation: Entrepreneurship for the 21st Century*, 5th edition. Boston, MA: Irwin McGraw-Hill.

Tornikoski, E. T. and Newbert, S. L. (2007). 'Exploring the determinants of organizational emergence: a legitimacy perspective'. *Journal of Business Venturing*, **22**, 311–35.

Vivarelli, M. (2004). 'Are all the potential entrepreneurs so good?'. *Small Business Economics*, **23**, 41–9.

Westhead, P. and Wright, M. (1998). 'Novice, serial and portfolio founders: are they different?'. *Journal of Business Venturing*, **13**, 173–204.

Winter, S. G. (2003). 'Understanding dynamic capabilities'. *Strategic Management Journal*, **24**, 991–5.

Zahra, S. A., Sapienza, H. J. and Davidsson, P. (2006). 'Entrepreneurship and dynamic capabilities: a review, model and research agenda'. *Journal of Management Studies*, **43**, 917–55.

Zollo, M. and Winter, S. G. (2002). 'Deliberate learning and the evolution of dynamic capabilities'. *Organizational Science*, **13**, 339–51.