



Advice and SMEs: Who Takes it and What Happens Thereafter?

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ABSTRACT

The role of business advice or so-called “guided preparation” on business performance in small and medium-sized enterprises (SMEs) has become a topic of perennial interest within entrepreneurship research. Despite a sizable body of work on this topic, the evidence remains mixed about the impact business advice has on SME performance. Using a unique longitudinal dataset, this study examines the impact of both day-to-day and strategic advice on firm-level innovation and productivity in UK SMEs. This research therefore responds to a lively recent debate about the “benefits” and “teachability” of entrepreneurship by showing that entrepreneurs not only can be taught to make better decisions but also that the use of this approach is associated with superior business performance. Our findings reveal that firms that used external advice see an average increase in their labour productivity by 22.1% compared to firms that did not use external advice. We find that strategic advice appears to play a central role in unlocking the innovative potential of firms which then ultimately leads to productivity enhancing behaviours. Policy frameworks need to become better attuned at informing SMEs of these powerful positive spillovers from seeking external advice rather than generically advertising different sources of advice *per se*. The particular importance of strategic advice is a key takeaway from this study and one which may need further prioritisation within current public policy frameworks.

Key Words: SMEs, Advice, Innovation, Productivity, Policy

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NON-TECHNICAL SUMMARY

External advice is crucial to help inform the decision-making processes by entrepreneurs and managers in small and medium-sized (SMEs). Advice is especially important for less experienced *de novo* entrepreneurial ventures during their inception when levels of uncertainty are often particularly acute.

This research therefore responds to a lively recent debate about the “benefits” and “teachability” of entrepreneurship by showing whether entrepreneurs can be taught to make better decisions but also that the use of this approach can translate into superior business performance.

Despite the strong focus business advice receives in public policies the effectiveness of these informational services remains a contested issue. While widely adopted by most governments in advanced economies, the evidence on the efficacy levels of business advice remains largely inconclusive.

Drawing on the Longitudinal Small Business Survey (LSBS) undertaken by the UK’s Department of Business and Trade, this report provides new insights into the benefits of different kinds of business advice and how this affects the levels of innovative and productivity within UK SMEs.

Past research has tended to examine the types of firms who seek advice and how effective they perceive this advice to be using self-reporting methods such as questionnaires. To determine their performance research often examines (again using self-reported methods) things like sales and turnover immediately after undertaking various forms of advice.

For many SME advice programmes, it is likely that a number of confounding variables – factors that influence both who takes advice and outcomes thereafter – or firms’ unobservable characteristics (such as entrepreneurial human capital of founders or a firm’s desire to grow) may play a role in outcomes observed. These can be difficult to identify and disentangle, raising concerns that an assessment will incorrectly attribute outcomes to the programme rather than to these firm characteristics or confounding variables.

To address potential selection bias, this study estimates the impact of external advice on outcome variables using non-parametric matching. This method helps to answer the question: “how would a firm that received external advice have performed had it not received such advice?”

In this study, enterprises that use external advice are matched to enterprises that do not use external advice (and are never observed to do so) based on the following characteristics: employee group, whether they operate more than one plant, age, year, region, industry.

Interestingly, this work examined the role of different types of advice: i.e. day-to-day advice and strategic advice. Basically, the former involves advice around operational matters such as regulation and legal issues etc, while the latter involves advice about growth enhancing activities such as innovation, exporting and new product or business model development.

An ‘average’ firm in our sample were SMEs aged between 11 and 20 years with less than 10 employees. On average, around a quarter (27%) of the firms in our sample engaged in some form of external advice and they are most inclined to use advice related to day-to-day operations. Of these firms, 36% utilized day-to-day operational advice, 28% opted for strategic advice, and 19% used both types of advice. The remaining 17% engaged in “other” forms of advice not specifically categorised under day-to-day or strategic headings¹.

Our research findings are striking and clear cut. It appears that accessing business advice improves firm performance on a number of different entrepreneurial outcome measures, such as increased levels of innovation and productivity. While taking a combination of both day-to-day and strategic advice enhanced productivity, it appears that for the most “radical” innovators the pursuance of strategic advice was the critical factor enhancing performance.

Strategic advice appears to play a central role in unlocking the innovative potential of firms which then ultimately leads to significant productivity enhancing behaviours. This type of advice appears to play a critical role in mitigating some of the uncertainty and ambiguity confronting entrepreneurs when making critical decisions about a firm’s long-term strategic plans.

In line with other recent studies our findings find strong empirical support for the benefits of a scientific and rational decision making in firms. External business advice can therefore be viewed as a sign of firms (and managers therein) adopting more deliberative, well-informed and considered cognitive behaviour. Accessing these “open” sources of knowledge and information also seems to augment the traditionally low levels of absorptive

¹ These “other” forms of advice are uncategorised either because they do not cover the entire period from 2015-2022, or they are unspecified.

capacity in SMEs - which is the ability to evaluate the technological and commercial potential of knowledge in a particular domain, assimilate it, and apply it to commercial ends.

The work has important policy implications. To help promote more proactive “advice seekers” policy needs to become better attuned at informing SMEs of the powerful positive spillovers from seeking external advice. Within public policy there may need to be more explicit customer segmentation between different categories of SMEs.

There is likely to be a strong divergence between traditional low aspirational SMEs seeking generic help around day-to-day managerial issues and a smaller cohort of growth-oriented firms who require strategic advice to help fulfil their true growth potential. To increase productivity across the SME population access to more strategic sources of advice seems a sensible policy goal.

1.INTRODUCTION

Entrepreneurship poses significant challenges, uncertainties and liabilities which can dissuade entrepreneurs from embarking upon entrepreneurial activities (Bergman and McMullen, 2022). Many of these impediments are linked to a lack of information to help further develop and improve entrepreneurial decision-making capabilities. Indeed, entrepreneurship scholars are acutely aware of the central role of “strategically actionable knowledge” when undertaking new venture formation (Kimjeon and Davidsson, 2022, p. 644). This research contributes to a lively recent debate within entrepreneurship about the “benefits” and “teachability” or a so-called “scientific” approach towards entrepreneurship by examining whether entrepreneurs can be taught to make better decisions but also whether the use of this approach is associated with superior business performance (Sergeeva et al, 2021; Zellweger and Zenger, 2022; Camuffo et al, 2024)². Our central focus of this particular study is to examine whether there are innovation and productivity enhancement benefits for SMEs who take business advice and what types of advice have the greatest impact on firm performance.

Virtually every advanced economy has deployed a plethora of business advice programmes designed to assist the creation, growth and development of new and small firms (Wren and Storey, 2002; Cumming and Fischer, 2012; Mole, 2023). Indeed, there is now a vast array of business advice programmes spanning a number of different operational and strategic business support requirements. The role of external advice, or so-called “guided preparation” (Chrisman et al, 2005)³, for small and medium-sized enterprises (SMEs) has therefore become a topic of perennial interest within the entrepreneurship research field over the last three decades (Bergman and McMullen, 2022; Mole, 2023). On the whole, it has also become something of the “received wisdom” that business advice is efficacious for assisting the growth of SMEs (Cumming and Fischer, 2012; Cumming et al, 2015) despite inconclusive evidence to support this thesis (McKenzie, 2021).

Despite this entrenched belief system, the levels of hard empirical evidence to support this supposition remain partial and contested, especially in terms of the impact advice has for all round levels of innovation and productivity growth within assisted firms (Rotger et al, 2012; Mole, 2023). While sources of external business advice are universally seen as a

² The main thrust of this scientific approach is that it improves decisions because it ensures that they are based on a more accurate understanding of the contingencies that will lead to higher performance (Camuffo et al, 2024).

³ Advice is also often referred to as “coaching” (Cumming and Fischer, 2012).

“good thing”, it is fair to say that academic evidence of the effectiveness (or otherwise) of these initiatives is at best “patchy” and “disputed” (Cumming and Fischer, 2012; Rotger et al, 2012; Mole et al, 2017) with a recent meta-analysis of the wide-ranging literature concluding that overall research “remains mixed and inconclusive” regarding performance metrics (Bergman and McMullen, 2022, p. 700). Similarly, a major review of over 700 policy evaluations across OECD countries on this subject concluded “results are generally mixed” (What Works, 2016, p.3). Of these evaluations only nine examined productivity growth, with three showing a positive impact and six showing zero or mixed impact (What Works, 2016). This research report wishes to address this omission by specifically exploring the role different types of advice (and combinations thereof) plays in shaping firm-level performance outcomes such as innovation and productivity enhancements in SMEs.

2. LITERATURE REVIEW

2.1 Theoretical Issues: Why Advice Matters

The literature on business support typically breaks it down into two archetypal variants: relational and transactional (Brown and Rees Jones, 2024)⁴. Transactional support comprises “off the shelf” financial assistance for activities such as innovation or incentives to fund capital expansion. Relational support, on the other hand, comprises softer forms of bespoke support such as business advice, coaching and peer mentoring. Advice seeking essentially involves seeking counsel or “guided preparation” (Chrisman and McMullan, 2005) from internal or external actors about the best course of action when making strategic and operational decisions and is especially important for new entrepreneurs (Mole et al, 2017) with relative lack of experience in dealing with conditions of environmental dynamism and high uncertainty (Bennett and Robson, 1999a; Rotger et al, 2012; Yitshaki, 2024).

Advice is a core aspect of many scholarly disciplines such as economics, management, and social psychology (Çelen et al, 2010) and a range of different theoretical concepts have been deployed to understand the role and potential importance of business advice. In entrepreneurship the focus typically explores decision-making and its mediating mechanisms: *rationality* and *uncertainty* (Packard and Bylund, 2021; Lin et al, 2022; Fisher and Neubert, 2023). At the core of the need for advice is the notion that most economic agents, such as start-ups and SMEs, suffer from “bounded rationality” (Simon, 1955).

⁴ There are sometimes categorised as “soft” or “hard” support (Wren and Storey, 2002; Rotger et al, 2012).

Bounded rationality refers to the notion that “individuals do not always engage in extensive information gathering and processing to identify optimal choices” (Hallen and Pahnke, 2016, p. 1537) so that while they aim to be rational in their decision making, their ability to do so is circumscribed by imperfect information which limits in their ability to gather, interpret, and process new knowledge (Simon, 1955).

Due to these informational limitations individuals engage in “satisficing” behaviour whereby they stop searching for information and accept alternatives that appear “good enough” and rely instead on cognitive *biases* (Cohen et al, 2019). These cognitive biases and heuristics mean “people rely on a limited number of heuristic principles by which they reduce the complex tasks of assessing likelihoods and predicting values to simpler judgmental operations” (Tversky and Kahneman, 1974, p. 1). While sometimes useful these heuristics can lead to “systematic errors” when “noise” clouds human judgement due to “unwanted variability” in decision making (Kahneman et al, 2021) which if left unabated can result in suboptimal outcomes (Cohen et al, 2019).

In social settings, where agents can observe one another’s actions, it is rational for them to try to learn from one another through a process of interaction. Within a “social learning theory” perspective, advice is viewed as generating a process of social learning and “the presence of advice increases subjects’ welfare” (Çelen et al, 2010, p. 2). On this basis, a social learning perspective stresses how advice entails a dynamic two-way interactive process of exchanging information, involving the “advice seeker and advice supplier” whereby the decision maker may utilise the advice or disregard it, but in the process of exchanging information “a new piece of knowledge or perspective is inevitably transferred” (Rostamkalaei and Freel, 2017, p. 539). Some claim that advice utilisation is strictly related to a specific case of any given company because advice is bespoke and “single-use, unique in its application, and takes into account a range of unique factors, including the personality of the entrepreneur” (Łobacz et al, 2016, p. 132). Similarly, others found that entrepreneurs develop unique tacit knowledge during this iterative “sense-making process” (Hanlon and Saunders, 2007, p.634). Evidence surrounding the use of advice by small firms suggests a strong use of social networks as network capability enables entrepreneurs access to “unevenly distributed information” (Kuhn et al, 2016; Shu et al, 2018, p. 200).

This begs the question as to why advice is welfare-enhancing and potentially efficacious. Some attribute the role of advice as a process of enhancing “absorptive capacity” (Cohen and Levinthal, 1990; van Doorn et al, 2017). Cohen and Levinthal (1994, p. 227) claim absorptive capacity marks the ability to “exploit” outside knowledge which “is comprised of

the set of closely related abilities to evaluate the technological and commercial potential of knowledge in a particular domain, assimilate it, and apply it to commercial ends". According to Cohen and Levinthal (1994, p. 227) prior research suggests firms cannot seamlessly exploit external knowledge but must first "develop their capacities to do so, often through the pursuit of related technical activities". It is this proactive behaviour to assimilate new knowledge that leads them to claim that fortune favours the "prepared firm" (Cohen and Levinthal, 1994). That said, while advice can bring additional informational resources to aid preparedness it can have downside effects as seeking advice might result in information overload in smaller firms. This is particularly challenging as advice from different actors outside organisational boundaries may prove to be contradictory and/or insufficiently applicable to the realities of the firm involved (van Doorn et al, 2017). Smaller firms are therefore often prone to "myopia" that leads them to "undersearch" in many areas of their business strategy (Levinthal and March, 1993).

2.2 Empirical Studies on Advice and SME Performance

Over the last three decades or so there has been an upsurge of SME business advice schemes implemented by various levels of policy making. However, despite their ubiquitous nature there seems little concrete evidence of their overall effectiveness (Bennett, 2008). In tandem with the increasing popularity of these schemes there has been a rapidly growing body of work examining various issues connected to business advice and SMEs. While considerable research has been accumulated on the nature of business advice programmes gaps in our knowledge remain nevertheless, especially concerning the thorny issue of how these schemes impact on firm-level performance. (Mole, 2023).

Extant studies have examined a number of different aspects of advice schemes including, *inter alia*: the traits (gender and ethnicity and so on) of founders (Kremel and Yazdanfar, 2015; Kremel, 2016), types of SMEs seeking advice (Johnson et al, 2010; Kösters and Obschonka, 2011; Naldi et al, 2015; Mole et al, 2017; Kuhn et al, 2017; Chatterji et al, 2019), sectoral variations in the use of advice (Webber et al, 2005), the types of interactions, diagnostics and levels of trust between SMEs and providers of advice (Bennett and Robson, 1999; Mole, 2007; Mole et al, 2014; Bennett and Robson, 2004; Chatterji et al, 2019), the nature, quality and delivery mechanisms of advice (Simpson and Docherty, 2004; Mole et al, 2014), advice on family succession issues (Cesaroni and Sentuti, 2017; Bertschi-Michel et al, 2021), the role of accountants as providers of advice (Jarvis and Rigby, 2012; Carey, 2015) issues surrounding the payment for external advice (Robson and Bennett, 2010; Gregson et al, 2018; Arshed et al, 2021), expectations of SMEs from

the advice obtained (Bennett, 2007) and the role of location in SMEs seeking advice (Bennett et al, 2001; Bennett and Smith, 2002; Mole and Capelleras, 2018).

In addition to these studies of who takes advice and how is the sizeable body of work on the role of advice on SME performance. Our main concern in this study is the impact of business advice on the performance of SMEs which has been a topic of sustained interest over the last 25 years. See Figure 1 below for key papers published on this thematic issue. This list of empirical studies is restricted to papers published in reputable academic research journals. While the coverage is comprehensive it may not be entirely exhaustive; for example, we limit our analysis to business advice studies conducted in developed economies.

Assessing the effects of business advice on firm performance can be a challenging task for researchers (Wren and Storey, 2002) which may explain why most early assessments of the impact of advice have been “much less common in previous research than surveys of level of use” (Robson and Bennett, 2000a, p. 1687)⁵. Another common feature of studies is a focus on advice and business survival (see Chrisman and McMullen, 2000; Wren and Storey, 2002; Rotger et al, 2012), while the main growth metrics observed were sales/turnover growth (Chrisman et al, 2006; Park et al, 2020) and/or finance obtained (Rostamkalaei & Freel, 2016; Ogane, 2020). The impact of advice on innovation was rarely examined (see Sawang et al, 2016). Indeed, the academic literature has featured a relative dearth in empirical studies which systematically try and tease out the causal connections between advice and subsequent firm performance in terms of innovation and productivity growth.

Common methodological approaches and their associated limitations are germane across this body of literature. First, many of the studies rely on bespoke surveys adopting self-reported measures regarding the entrepreneurs’ perceptions of the impact of advice. Often this draws on self-reported Likert style questionnaires which are often “unidimensional” (Croasmun and Ostrom, 2011) whereas guided preparation is fundamentally multi-dimensional in nature, some operationally focused while others are strategically oriented (Robson and Bennett 2000b; Antcliff et al, 2021). In addition, the measures of key constructs are perceptual rather than objective and comparable, consequently relying on correlations for partial representation (Dess and Robinson, 1984). This means the performance enhancing impact of advice is predicated on the subjective views of the recipients rather than objective information on firm-level performance. The underlying

⁵ See for example Mole et al (2017).

assumption behind this method is that senior managers, by virtue of their position in the company, are capable of providing opinions and perceptions that reflect the company's actual behaviour. Some claim this may constitute an important limitation for this research as they may not always produce reliable and valid responses due to a single key informant response using “approximate indicators” rather than multiple responses from firms and industries (Brattström et al, 2012).

A second, common feature of most studies is the focus on assisted firms or so-called “treatment group” without a comparable “control” group of non-recipients (Bergman and McMullen, 2022). Only two of the advice studies examined contained a control group (Wren and Storey, 2002; Rotger et al, 2012). However, propensity score matching (or PSM) replaces random comparisons of treated and untreated study objects, which is not feasible in observational studies, by a comparison of treated and untreated study objects that are matched by observable pre-treatment attributes (Rosenbaum, and Rubin, 1983). A further key limitation of the empirical evidence base is a lack of longitudinal studies (Ratinho et al, 2020). This is evident in our sample of studies which included only a single study which undertook longitudinal analysis (Chrisman et al, 2005). Longitudinal assessment is likely to prove significant as the impact of advice is likely to have differing temporal impacts; some immediate, some longer-term. For example, Rotger et al (2012) hypothesised that both anticipated positive impacts (badging ⁶ and knowledge enhancement) would enhance performance but that the impact of badging would be more immediate than knowledge acquisition/enhancement. Therefore, to fully capture the full impact of guided preparation adequate time is likely needed to have elapsed before the full extent of its impact will occur in terms of firm performance.

2.3 Hypothesis Development

Within the innovation and entrepreneurship literature it is well established that the primary sources of information to undertake innovation are exogenous to the firm (Van de Vrande et al, 2009) which is especially the case for small firms with parsimonious resource capabilities who rely heavily on external or “open” sources of innovation (Lee et al, 2010). Activities like external networking to acquire new or missing knowledge is an important open innovation activity among SMEs (Van de Vrande et al, 2009). In order to connect with relevant sources of innovation (and hence increase a firm’s absorptive capacity) we

⁶ Because new ventures have very uncertain outcomes, the founder has to send signals (or badging) to resource providers, most notably banks but also perhaps suppliers or even employees, to demonstrate their quality (Rotger et al, 2012).

would expect SMEs obtain advice to overcome these informational challenges to increase their innovation potential. Therefore, we posit the following hypothesis:

H1: The most radically innovative small firms will be those most receptive to taking advice

A key focus of this study was to better understand the impact of business advice on firm-level productivity. The extant literature on the impact of business advice points towards positive effects in terms of business survival (Chrisman and McMullen, 2000; Rotger et al, 2012), sales, turnover growth (Chrisman et al, 2006; Park et al, 2020) and finance raised (Rostamkalaei & Freel, 2017). Given these positive outcomes we would speculate that these positive effects would extend to enhanced firm-level productivity, especially given the role advice can potentially play in increasing innovation as posited in **H1**. Hence, we wish to advance the following related hypothesis:

H2: Taking advice leads to enhanced productivity in SMEs

Following this, we now turn to the interaction between different types of advice in terms of productivity gains. Productivity is patently a multi-factored concept (Griliches, 1987). Therefore, the role of different types of advice are likely to be needed to help improve the all-round performance of a firm on a number of different organisational dimensions. While day-to-day advice might be considered associated with the general operational efficiency of running a business, strategic advice is more focused on altering the longer-term dynamic capabilities of a firm such as undertaking new product development (Teece and Leih, 2016). Based on this we would anticipate that productivity improvements would potentially be most likely in firms taking both “types” of advice. We forward the following hypothesis thus:

H3: Increases in productivity are greatest in SMEs accessing both day-to-day advice and strategic advice

Turning to our final hypothesis, we wish to unpack the complexities of the innovation-productivity nexus further. A large number of empirical studies measuring the effect of innovation (product and process) on productivity at the firm level show a strong association between the two but as yet have failed to “provide a unique answer in terms of the magnitude of this impact” (Hall et al, 2009, p. 15). Our intention isn’t to directly address this issue *per se*, but to ascertain what “type” of innovation facilitated by access to external advice has the largest effect on productivity. Evidence suggests that while incremental innovation gives rise to productivity gains, it is radical innovation that is the main engine of growth (Acemoglu et al, 2022). Following this, we posit the final hypothesis:

H4: Strategic advice substantially enhances labour productivity by fostering radical product innovation

3. DATA AND METHODS

3.1 Data and variables

Following others (Saridakis et al, 2019), we use data from the UK LSBS between 2016 and 2022, a large-scale survey of the owners and managers of small UK businesses (businesses with fewer than 250 employees), commissioned by the Department for Business and Trade (DBT) on an annual basis. This is the most detailed survey of SMEs in the UK and includes a host of questions on both sources of firm knowledge and information as well as firm performance outcomes. Unlike other UK SME surveys, this is a longitudinal rather than a cross-sectional survey. Therefore, each year a subset of the SMEs interviewed in the previous year were selected in the subsequent LSBS for repeat interviews, allowing a detailed comparison analysis of how certain combinations of factors affect business outcomes on a temporal basis.

Table 1 reports the definition of the variables used in this study. Labour productivity is defined as sales per employee. We also use sales and employee as alternative performance outcome measures widely used in the literature (Brouwer et al, 1993). All three variables enter the regressions in natural logarithms to reduce the skewness of the measures. The primary independent variables of this study relate to the receipt and types of formal, external business advice, defined as external advice or information on matters affecting the business in the form of more than a casual conversation. Conditional on receiving advice, the survey further asks the specific types of information the advice concerned. Following others, of the seventeen types of advice, we further classify them as either day-to-day or strategic advice (Mole et al, 2017). The former includes advice on employment law, financial advice for general running business, health and safety, legal issues, regulations, tax/national insurance related, training, and workplace pensions; and the latter includes advice on business growth, e-commerce/technology, exporting, financial source, business efficiency/productivity, innovation, management/leadership development, marketing, and relocation. Due to the fact there is no systematic delineated boundaries between these two archetypal types of advice, taking advice will inevitably involve “varying degrees” of both operational and strategic advice (Mole et al, 2017, p. 478). Clearly, however, the former focuses on operational and regulatory compliance issues whereas the latter are more focused on instilling mechanisms for growth-related performance enhancement.

Besides firm size (employment and sales), we further control for other measures of business demographics and operating activities that are commonly found to be associated with productivity. Firm demographic measures include firm age, sector and region. Operating characteristics include use of multiple operation sites, and variables that capture innovation activities. Specifically, we collect information on both product (goods or services) and process innovation outcomes. An innovation can be deemed as new to the individual firm, or to the market, where the former is defined as “incremental” and the latter as a “radical” innovation (Beck et al, 2016). The responses to the survey question in the LSBS, ‘Were any of these new or significantly improved goods and services innovations new to the market, or were they all just new to your [business]?’ allow us to create a categorical variable that classifies product innovation as radical.

3.2 Methodology

The key variable, external advice, is not randomly distributed among firms. It is often sought by companies that are underperforming or facing significant challenges—a situation known as “problematic search” (Posen et al. 2018). Firms may also seek external advice due to increased uncertainty in their operating environments. This selective seeking behaviour introduces a selection bias, which must be considered when evaluating the impact of external advice (Mole, 2017).

To address potential selection bias, we follow the methodology outlined by others (Sun, 2023) and estimate the impact of external advice on labour productivity using non-parametric matching (Imbens and Wooldridge, 2009). This approach matches each observation from the treated group with a comparable observation from the untreated control group. The counterfactual outcome—what what would have occurred in the absence of the treatment—is captured by the Average Treatment Effect on the Treated (ATT), which is calculated as the average difference in outcome variables between the treated group and the matched counterfactuals.

The matching estimator relies on the Conditional Independence Assumption (CIA) to ensure unbiased estimates. This assumption requires that there are no unobserved factors affecting both the engagement in external advice and labour productivity. Therefore, we posit that all determinants of engagement, external advice and labour productivity are observed in the LSBS.

The question, “What would labour productivity have been for a firm that engaged in external advice if it had not engaged in such advice?” can be addressed using a matching estimator, which is represented by the following formula

$$TE_{it} = Y_{it}(T_{it} = 1) - Y_{it}(T_{it} = 0)$$

Where TE_{it} stands for the treatment effect for firm $i = 1, 2, \dots, n$ at time t . T_{it} is the treatment variable that equals one if firm i used external advice at time t , and zero otherwise. Y_{it} is labour productivity for firm i at time t . Therefore, $Y_{it}(T_{it} = 1)$ represents the potential labour productivity for firm i at time t if it used external advice. On the other hand, $Y_{it}(T_{it} = 0)$ represents the potential labour productivity for firm i at time t if it did not use external advice. Thus, the above expression calculates the difference between the potential labour productivity for a firm that used external advice and outcome for this firm that did not use external advice. This difference illustrates the causal impact of external advice on labour productivity for that firm at time t . Thus, the Average Treatment Effect (ATE) can be expressed as:

$$ATE = E(TE_{it}) = E[Y_{it}(T_{it} = 1) - Y_{it}(T_{it} = 0)]$$

To narrow the analysis to firms that actually intended engaging in external advice, Average Treatment Effect on the Treated (ATT) is used, which is mathematically represented as:

$$ATT = E[Y_{it}(1)|T_{it} = 1] - E[Y_{it}(0)|T_{it} = 1]$$

The expression calculates the difference between the expected labour productivity for firms that used external advice and the expected labour productivity for the same firms if they had not used external advice. However, selection bias is created when the second term of the above equation is replaced by the expected labour productivity of firms that did not use external advice. ATT can now be written as:

$$ATT = E[Y_{it}(1)|T_{it} = 1] - E[Y_{it}(0)|T_{it} = 0] - (selection\ bias)$$

Where

$$selection\ bias = E[Y_{it}(0)|T_{it} = 1] - E[Y_{it}(0)|T_{it} = 0]$$

If CIA is satisfied, the following equation must hold:

$$E[Y_{it}(0)|T_{it} = 1, X_{it}] = E[Y_{it}(0)|T_{it} = 0, X_{it}] \quad (1)$$

Equation (1) illustrates that there is no systematic difference in expected labour productivity $Y_{it}(0)$ for firm who used external advice ($T_{it} = 1$) and those who did not ($T_{it} = 0$), after controlling for firm characteristics X_{it} .

Consequently, the *ATT* can be calculated as the difference between the expected labour productivity for firms that engaged in external advice and those that did not, after controlling for firm characteristics. Therefore, *ATT* can be rewritten as:

$$ATT = E[Y_{it}(1)|T_{it} = 1, X_{it}] - E[Y_{it}(0)|T_{it} = 0, X_{it}]$$

This formula allows us to estimate the causal impact of external advice on firm level labour productivity after controlling for potential confounding factors. To compute the *ATT*, we replace the counterfactual labour productivity for firms that did not receive external advice with the average labour productivity of a well-matched untreated firms.

Mahalanobis Distance Matching (MDM) is an econometric approach used to create untreated control groups that are statistically comparable to the treated groups. The distribution of observed characteristics between treated and untreated units is achieved by balancing covariates across the two groups. MDM pairs units based on the Mahalanobis distance, which accounts for the covariance structure of the covariates rather than relying on simple Euclidean distance. The Mahalanobis distance adjusts for differences in scale across covariates by using a scaling matrix derived from the sample covariance matrix, ensuring that matched pairs have comparable distributions of covariates. This method matches units directly on the covariate space, resulting in closely aligned covariate values for treated and control units, thus improving the overall balance in the matched sample.

Given the limited available variables in LSBS, MDM is employed. MDM is particularly effective in scenarios with fewer covariates, as it directly measures the similarity between observations using the Mahalanobis distance (King & Nielsen, 2019).

In this study, the baseline approach for estimating the *ATT* addresses the 'curse of dimensionality' by employing a distance metric to assess the similarity between observations in the treated and untreated groups. Observations are matched if their similarity distance falls below a specified threshold. The distance between two observations X_{it} and X_{jt} is calculated by the Mahalanobis metric, which can be written as:

$$D_{Mahalanobis}(X_{it}, X_{jt}) = \sqrt{(X_{it} - X_{jt})' S^{-1} (X_{it} - X_{jt})}$$

Where $(X_{it} - X_{jt})$ is the difference between the covariate values of the two observations, calculated element-wise. The inverse of the covariance matrix, S^{-1} , is used to standardize the differences between the observations by considering both the scale (variance) of each covariate and their correlation with each other. Therefore, the multiplication calculates the

weighted sum of the squared differences between the two observations, where weights are determined by the covariance matrix.

The general formula for estimated ATT then considers the matched observations and their respective weights in the control group. The formula is expressed as:

$$\widehat{ATT} = \frac{1}{N^{T=1}} \sum_{i \in \{T=1\}} [Y_{it}(1) - \sum_j w(it, jt) Y_{it}(0)]$$

Where $N^{T=1}$ is the number of treated observations, and $w(it, jt)$ represents the weight assigned to the j -th observation in the control group when matching with the i -th treated observation.

Several matching algorithms are commonly used to determine the matching weight $w(it, jt)$. One such method is pair-matching (also known as one-to-one nearest neighbor matching) without replacement, where each treated unit is matched with the closest untreated unit, and each untreated observation can only be matched once. However, Jann (2017) contends that this approach can lead to biased estimates, as it discards observations that have the same matching distance, potentially distorting the results.

An alternative approach to pair-matching without replacement is allowing untreated observations to be matched to multiple treated units (i.e., n-to-1 matching). This approach avoids the issue of 'random pruning' and increases the number of matched untreated observations, potentially improving covariate balance and leading to more accurate estimates (King et al., 2017). In this method, each matched control observation is uniformly assigned a weight of $\frac{1}{n}$, while unmatched controls receive a weight of zero. To prevent the loss of efficiency from excluding potentially well-matched untreated units, the baseline approach applies the Epanechnikov kernel function to assign weights $w(it, jt)$ to untreated observations that fall within a specified matching distance of the treated units. The weight formula can be written as:

$$w(it, jt) = \frac{K(X_{it} - X_{jt})}{\sum_{i \in \{T=1\}} K(X_{it} - X_{jt})}$$

Where $K(\cdot)$ represents the Epanechnikov kernel function, which assigns greater weights to more similar observations and smaller weights to less similar ones. The threshold for dissimilarity, known as the bandwidth, defines the maximum allowable distance for matching. A pair-matching algorithm is applied to determine the bandwidth (Huber 2013, 2015).

Regression adjustment is also used during matching to account for any residual differences in covariates between the treated and untreated groups in the matched sample (Abadie and Imbens, 2011). This approach involves estimating a regression model where the treatment variable is interacted with all other covariates to correct for these remaining imbalances. The model is specified as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + t_0 T_{it} + t_1 T_{it} X_{it} + u_{it}$$

The *ATT* can be calculated by:

$$\widehat{ATT} = t_0 + E[t_1 X_{it} | T_{it} = 1]$$

In this study, enterprises that used external advice were matched with enterprises that did not use external advice (and were never observed to do so) based on several characteristics: employee group, multi-plant operations, age, year, region, and industry. To ensure comparability, the supported and unsupported enterprises were required to be exactly matched on the latter three variables: year, region, and industry.

4. FINDINGS

4.1 Descriptive statistics

Table 2 reports the descriptive statistics from our analysis. An ‘average’ firm in our sample aged between 11 and 20 years with less than 10 employees. Firms are diversified across 12 different regions of the UK, where over one-fourth of them are located in the Southeast area and London. Around one-fifth (18%) of the firms in our sample have more than one operations site which may explain the broad geographic spread. Both labour productivity and sales are measured in natural logarithms, with mean values of 11.116 and 12.863, respectively. The wide range and standard deviations of these variables indicate significant variability in firm performance across the sample.

On average, around a quarter (27%) of the firms in our sample has engaged in some form of external advice and they are most inclined to use advice related to day-to-day operations. Of these firms, 36% utilized day-to-day operational advice, 28% opted for strategic advice, and 19% used both types of advice. The remaining 17% engaged in “other” forms of advice not specifically categorised under day-to-day or strategic⁷.

⁷ These “other” forms of advice are uncategorised either because they do not cover the entire period from 2015-2022, or they are unspecified.

Regarding business activities, nearly a quarter (24%) of the firms have exported goods or services outside the UK, and 57% of them have introduced new or significantly enhanced products or processes. This substantially large ratio of firms engaged in innovation activities also amplifies the importance of exploring the indirect spillover effect of innovation on firm-level productivity. We further distinguish activities related to radical innovation from the other and find that over 65% of the firms in our sample have introduced radical innovation. With a substantial focus on innovation and external advice-seeking behaviour, our sample contains a diverse and varied dataset of SMEs encompassing a wide range of ages, industries, regions, and operational characteristics.

4.2 Estimated Impacts on Innovator Status

Impacts on innovator status are estimated using bias-corrected multivariate distance matching. To see the full picture of the effects, our analysis focuses on the Average Treatment Effect on the Treated (ATT) for four categories of advice: firms that used any form of external advice, firms that used day-to-day advice only, firms that used strategic advice only, and firms that used both forms of advice. Results are shown in Table 3.

The empirical results suggest that firms engaging in any form of advice experienced significant improvements in their innovator status. Strategic advice demonstrates a stronger positive impact on innovator status compared to day-to-day advice. Notably, the combination of day-to-day and strategic advice leads to the highest improvements in innovator status, underscoring the importance of comprehensive advisory support. These results support Hypothesis H1.

4.3 Estimated Impacts on Labour productivity, employee, and sales

Effects on outcomes (labour productivity, employee, sales) are estimated using the sample created from the LSBS, which includes firms that received external support only once. Specifically, our models will examine the short-term impact one year after receiving external advice and will further assess a longer-term impact over a 5-year window. This allows us to estimate the temporal effects across different time windows more comprehensively. We exclude firms that received external support more than once, for which the estimated effects would be ambiguous as they reflect a combination of both short-term and long-term impacts of external advice. Since labour productivity is calculated as sales per employee, including sales and employee as extra outcome variables allows for a more comprehensive analysis. This approach helps isolate the direct effects of external advice on both sales and employee numbers, enabling a deeper investigation into

which variable(s) primarily drives changes in labour productivity. Additionally, it provides robustness checks and detailed insights that can inform policy recommendations.

The estimated short run and long run effects on labour productivity, employee, and sales for firm used any external information and advice are presented in Table 3 and Table 4, respectively. The average treatment effects on the treated are estimated from a bias-corrected multivariate distance matching. Though the sample size is reduced significantly for the 5-year window estimations, a good level of balance of the matched sample is achieved in all instances.

For the treatment variables, the problem of uneven attrition between the treated and untreated groups in the long-term analysis is detected using a probit model, where the dependent variable is a dummy equal to 1 if a firm exits during the 5-year period, and 0 otherwise. The significance of the treatment variables, "any advice" and "day-to-day advice," suggests that exit rates differ between treated and untreated firms after receiving these types of advice. This issue is addressed through the application of inverse probability weighting (Seaman and White, 2013).

Table 4 presents the estimated effects on outcomes one year after SMEs accessed any external information and advice. The results indicate that using external information and advice, regardless of which form, leads to substantial enhancements in labour productivity, employee, and sales. Specifically, SMEs that engage with external advice experience significant increases of 8.8%, 3.2%, and 14% in labour productivity, employee, and sales growth, respectively, compared to similar SMEs that do not avail themselves of external advice.

To examine the long-term impact of external advice, we run the model over a 5-year period following treatment. The primary reason for the reduced sample size is the requirement that firms must remain in the LSBS dataset for at least 5 years after reporting their use of external advice, particularly given that the LSBS is an unbalanced panel.

As reported in Table 5, SMEs benefit significantly from external advice, with significant improvements in labour productivity that endure in the long run. The estimated average treatment effect on the treated for labour productivity after five years is 0.189, indicating firms that used external advice see an average increase in their labour productivity by 18.9% compared to firms that did not use external advice. To delve deeper into the factors driving the significant labour productivity gains, the estimated effects on employees and sales are also reported in Table 5. Both employee and sales show a statistically significant and consistent boost over the five-year period following the use of external advice. Firms

that used external advice experienced an average increase in their employee and sales by 23.4% and 60.5% respectively at the end of the five-year period compared to firms that did not use such advice. This suggests that SMEs seeking external advice experience substantial and sustained improvements in firm performance, which subsequently translates into enhanced labour productivity.

Tables 6 to 8 present the estimated short-term effects of these different types of external advice on labour productivity, employee, and sales. Each table corresponds to a specific category of advice: Table 6 presents the effects of day-to-day advice, Table 7 focuses on strategic advice, and Table 8 examines the combined effects of both types of advice. This categorization allows for a thorough examination of how different forms of external advice interact and impact entrepreneurial outcomes differently.

Table 6 presents the effects of day-to-day advice one year after firms used this form of support. Significant enhancements are evident across all measured outcomes compared to firms that did not receive such advice. SMEs that used day-to-day advice experienced a substantial 8% increase in labour productivity. Furthermore, the impacts on employee and sales are also significant, with magnitudes of 48.9% and 87.4%, respectively.

The estimated effects of strategic advice are presented in Table 7. In comparison to the estimated effects of day-to-day advice, the impacts of strategic advice on employee and sales are both slightly lower, though still statistically significant. However, the effect on labour productivity is notably higher, indicating a significant increase of 10.9% after utilizing strategic advice. This suggests that strategic advice has a stronger productivity-enhancing effect than day-to-day advice.

Table 8 assesses the combined effects of receiving both day-to-day and strategic advice. The findings reveal more pronounced enhancements across all outcomes. Labour productivity is significantly improved by approximately 14% for firms that used both forms of advice compared to those that did not use any external advice. This improvement stems largely from substantially increased sales; firms that adopted both forms of advice nearly doubled their sales compared to firms that did not use any external advice, alongside a significant 47% increase in employee numbers.

Moreover, the long run (5-year) effect of using different types of advice is also estimated. Results are shown in Tables 9 to 11. The results underscore statistically significant and positive long-run impact of strategic and both advice on both sales and employees. Particularly, firms that utilised both day-to-day and strategic advice experienced substantially larger increases in sales and employees, with approximately 100% and 50%

respective increases compared to those that did not use any advice, at the end of the 5-year period.

While labour productivity maintains a positive trend and remains statistically significant for three years after the use of strategic or day-to-day advice, confirming a positive short- to mid-term impact of employing either type of advice, the situation becomes less clear for firms using both forms of advice. Although there is a positive effect on labour productivity, it does not achieve statistical significance until the fifth year. This could be due to a substantial increase in employment which acts as a lag effect, which in turn decreases labour productivity.

4.4 Mediation Test

To understand the mechanism through which external advice influences labour productivity, a mediation analysis is conducted. Within this framework, we hypothesise an indirect effect whereby external advice stimulates innovation, which subsequently leads to higher labour productivity. In case of a full mediation, the direct effect from advice to productivity is diminished once the indirect effect through innovation is considered, and a partial mediation means both direct and indirect effects are present. By investigating these potential effects, we aim to gain a deeper understanding of the specific roles of innovation as a potential mediator in the relationship between external advice and labour productivity.

Mediation variables, innovation, are measured through six distinct categories using the definition from LSBS (LSBS, 2023): 1) Innovator, which equals one if the firm engaged in either product or process innovation in the last three years. 2) Product innovation assigned a value of one if the firm introduced any new or significantly improved goods or services over the past three years. 3) Process innovation also assigned a value of one if the firm introduced new or significantly improved production or supply processes during the same period. 4) Radical innovators assigned a value of one if the firm undertook either radical product or process innovation within the past three years. 5) Radical product innovation, set at one if the product innovation was new to the market. 6) Radical process innovation, which is one if the process innovation was new to the market.

Table 12 presents the results of a mediation analysis examining the indirect effects of various types of innovation on labour productivity. Each cell in the table reports the estimated coefficient from the linear regression of labour productivity on different types of advice, mediated by the specific innovation type. The indirect effects (mediation effects) are estimated using a probit model with the same set of independent variables.

The findings in Table 12 suggest a notable pathway through which labour productivity is indirectly influenced. Specifically, the results indicate a significant indirect effect on labour productivity through “radical” product innovation, highlighting the pivotal role of strategic advice in fostering innovative product development within firms. However, other measures of innovation do not exhibit a similar indirect effect on labour productivity. This underscores the specificity of the relationship between strategic advice, radical product innovation, and labour productivity enhancement. In addition, the results also reveal a lack of indirect effects when firms solely rely on day-to-day advice. This observation suggests that the influence of day-to-day advice on labour productivity may not operate through the channel of innovation, at least as captured by the variables examined in this study.

5. DISCUSSION AND CONCLUSIONS

This report has enabled us to make a number of important contributions to the literature around the efficacy of business advice and observable firm performance outcomes. On an empirical level, hitherto research has been unable to precisely disentangle the productivity-advice nexus. Nor has there been explicit clarity provided around the impact of the different types of advice (and their interaction) which have the greatest demonstrable impact on firm performance. This work sheds important new light on these important questions which found support for all four hypotheses posited. Our results are clear cut and indicate that so-called “guided preparation” improves firm performance on a number of different measures, such as increased levels of innovation and productivity. While taking a combination of both day-to-day and strategic advice enhanced productivity, it appears that for the most “radical” innovators the pursuance of strategic advice was the critical factor enhancing performance. Strategic advice appears to play a central role in unlocking the innovative potential of firms which then ultimately leads to productivity enhancing behaviours.

These empirical findings also have important theoretical ramifications. Building on the cognitive psychology literature, despite its benefits in terms of speed and less cognitive effort, intuitive decision making can be prone to cognitive errors (Kahneman 2011; Lin et al, 2022). In line with other recent studies our findings find strong empirical support for the benefits of a scientific and rational decision making in firms (Sergeeva et al, 2021; Zellweger and Zenger, 2022; Camuffo et al, 2024). External business advice can therefore be viewed as a sign of firms (and managers therein) adopting more deliberative, well-informed and considered cognitive behaviour (Nuijten et al, 2020). Accessing these “open” sources of knowledge and information also seems to augment the traditionally low levels of absorptive capacity in SMEs. In essence, “outsider assistance” enhances knowledge

which is at the heart of competitive advantage (Rotger et al, 2012). Obtaining frequent exposure to new ideas and perspectives via strategic advice, means managers are also more inclined to question widely held assumptions making them better able to “identify, develop, and implement higher quality strategies” which can ultimately lead to better organizational performance (Vestal and Guidice, 2019, p. 235; Harvey and Fischer, 1997).

There are important policy implications emerging from this novel examination of the performance benefits emanating from SME business advice. Despite their ubiquitous nature, business advice programmes are often perceived sceptically on account of their perceived lack of efficacy (McKenzie, 2021). Contrary to this sceptical perspective, our findings strongly endorse external business advice as an important source of help to improve the competitiveness of SMEs. The particular importance of strategic advice is a key takeaway from this study and one which may need further prioritisation within current public policy frameworks. Perhaps policy frameworks need to become better attuned at informing SMEs of the powerful positive spillovers from seeking external advice rather than generically advertising different sources of advice *per se*. Within public policy there may need to be more explicit customer segmentation between different categories of SMEs. There is likely to be a bifurcation between traditional SMEs who seek generic help around day-to-day managerial issues and a smaller cohort of growth-oriented firms who require strategic advice to help fulfil their true growth potential (Brown and Rees-Jones, 2024).

In terms of future research on this important topic some obvious issues require further exploration. What engenders and steers SMEs towards “guided preparation” seems largely unbeknown at the present time and in order to help promote more proactive “advice seekers” more granular qualitative analysis of these firms seems imperative for help to inform future public policy. Another important consideration in this study is the variability in the time between firms receiving external advice and when measurable outcomes, such as increased innovation or productivity, arise. Although the study captures both short-term and long-term temporal effects, the time lag between receiving advice and realising its impact will vary among firms, which may add some complexity to interpreting the timing and magnitude of the observed effects. The study focuses on firms that received advice only once, yet future research could delve more deeply into the temporal dynamics of how and when the effects of advice materialise in recipient SMEs.

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APPENDIX

Figure 1. Literature on the Impact of Business Advice for SMEs, 1999-2024

Authors	Data and Methods	Thematic Focus of Advice	Findings
Bennett and Robson (1999b)	Bespoke survey of 2547 Business Link users in the UK of self-reporting in terms of perceived efficacy	Users of various forms of business advice provided by Business Link for UK SMEs	Preference for high trust private sector suppliers for the most crucial suppliers of advice. Generally, levels of use vary by SME type to a greater extent than levels of impact
Robson and Bennett (2000a)	Bespoke random sample survey of over 2500 UK SMEs from Dun and Bradstreet. Analysis included The impact of each source of advice is assessed by respondents on a 5-point Likert scale (1=no impact and 5 = crucial impact).	Users of UK business advice from public and private sources	Using multivariate logit models it is found that size of firm, rate of growth and innovation appear to be the main variables influencing the likelihood of firms seeking external advice. A Firm's size also seems to be the chief feature explaining the internal variations incapacity to use external advice effectively.
Robson and Bennett (2000b)	Bespoke random sample survey of over 2500 UK SMEs from Dun and Bradstreet. Analysis included The impact of each source of advice is assessed by respondents on a 5-point Likert scale (1=no impact and 5 = crucial impact).	Users of UK business advice from public and private sources	The relationship of external business advice with SME performance is statistically significant for only a small number of sources. There is little evidence of statistically significant relationships between government-backed providers of business advice such as Business Link and firm performance. Obtaining external advice in fields such as business strategy and staff recruitment is associated with positive firm performance.
Chrisman and McMullen (2000)	Recipients of the US Small Business Development Centre programme in the years were surveyed in 1994 and 1996 to obtain data on their performance one year after receiving the assistance (n, 169)	The SBDC provides entrepreneurs with counselling and business advice for new entrepreneurs commencing new firm formation. The counselling approach takes the form of directed study.	Results indicate that the assisted ventures had higher than expected rates of survival, growth, and innovation, suggesting that outsider assistance during the early stages of a venture's development can influence its subsequent development.
Wren and Storey (2002)	Sample of 4326 firms supported under the programme UK's Enterprise Initiative. Compares the impact using a "treatment" group and a "control"	Examines the impact of marketing consultancy advice under the UK's Enterprise Initiative in terms of survival and firm growth.	The paper found no impact of the advice on the survival of the smallest firms (less than 5 employees). In mid-range SMEs (employing between 6-80 employees) it raises the survival rate by 4% and increases growth rates by 10%.

	group on non-assisted SMEs		
Chrisman et al (2006)	This longitudinal US study was conducted among three groups of pre-venture clients who received five or more hours (average of 20) of counselling from the Pennsylvania Small Business Development Center (SBDC) programme in the years 1992, 1994, and 1996. The survey involves Likert scale questions to collect self-reported business sales and employment data.	The SBDC provides free, comprehensive managerial planning assistance to owner-managers of new and small firms, as well as continuing education seminars and workshops, small business research, government procurement assistance, export services, and minority support programmes.	The results suggest that the long-term growth of the ventures since start-up is significantly related to guided preparation. However, there are diminishing marginal returns associated with guided preparation and that too much may even have a negative influence on performance.
Berry et al (2006)	Bespoke survey of SMEs in the Manchester City region	Focuses on the impact of marketing advice support	The degree of use of a range of external advice was positively related to the growth rate of the SME. The most sought-after advisers were external accountants and network contacts.
Cumming and Fischer (2012)	Bespoke survey based on a sample of 228 early-stage firms in Ontario, Canada, of which 101 used business advisory services	This paper empirically examines the efficacy of publicly funded business advisory services in relation to entrepreneurial outcomes such as securing 1st rounds of financing and revenue generation techniques	This paper provides an empirical assessment of the impact of publicly funded business advisory hubs on entrepreneurial outcomes. It showed advising hours significantly and positively impact sales and financing, regardless of econometric controls for sample selection and endogeneity. Further, there was a positive association between advising hours and patents and alliances, but the causality was more ambiguous.
Rotger et al (2012)	Bespoke survey by the North Jutland Entrepreneurial Network (NiN) in Denmark. Sample of 608 and 464 in two cohorts of the programme. Using PSM they deploy quasi experimental methods to compare assisted firms with a control group - similar to Wren and Storey (2002).	The main goal of NiN is to guide and assist individuals engaged in the creation of a new venture via various main types of guided preparation: basic counselling, counselling by private sector consultants and specialist start-up consultants.	The paper concludes that the programme contributes to the survival and size of new ventures, but its impact on growth is less clear. The clearest effects relate to the two-year survival rate. Those taking advice raised their survival rates by between 3% and 12% depending on the time period considered and the type of advice taken, compared with otherwise similar firms not taking such advice
Carey (2015)	Bespoke Survey of 380 Australian SMEs	Examined the impact of private	Found a positive relationship between the voluntary

		procured business advice from Australian accountancy firms	purchase of business advice and SME performance, which was enhanced further when business advice is purchased jointly with auditing services
Cumming et al (2015)	Bespoke Survey of 100 Canadian SMEs. Use of self-reporting improvements in capabilities post-advice.	Publicly funded advice on firm internationalisation in Canada	The article offers support for the general proposition that receiving advice related to internationalization can help firms to develop their capabilities related to internationalization.
Rostamkalaei & Freel (2016)	The data collected is from the UK SME Finance Monitor (2011–2014).	The study identifies links between entrepreneurs' diligence, business risk and finance-related advice-seeking prior to initiating loan and overdraft applications	The results show evidence of the usefulness of advice in ameliorating, both structural and strategic, business risk and improving the prospects of successful debt applications to banks.
Sawang et al (2016)	Bespoke survey of 257 firms participated in the study. The study included a matched approach comparing assisted firms with unassisted firms, drawing on the Australian Bureau of Statistics (ABS) survey. This survey comprised self-administered, subjective measures obtained via a structured questionnaire containing closed questions.	The study examines a small business advisory service that is provided by QMI Solutions, an independent not-for-profit organization partly funded by Australian government. Programmes such as “ideas to market” that are offered through QMI are intended to be a counselling approach and integrated with multiple follow-up sessions as a part of programme coaching.	The study found that business advisory programs involving high levels of collective learning and tailored approaches were deemed more useful. We verified this finding by testing whether firms that have participated in small business advisory services subsequently demonstrate improved behaviour in terms of organizational innovativeness, when compared with matched firms that have not participated in an advisory programme.
Kuhn et al (2017)	A web-based survey of business owners in a Midwestern U.S. state involving a sample of 528 SMEs (nearly all has less than 50 employees). Self-reporting scale to assess effectiveness.	Founders were asked to indicate the formal and informal sources they had relied on for advice during the previous year and to identify which was most beneficial to them, what types of advice they received from their best advisor, and	Better educated owners and those with growing businesses sought advice from a greater variety of sources. Improved business performance was positively associated with greater network breadth.

		how they communicated.	
Gregson et al (2018)	Analysis of the UK Longitudinal Small Business Survey (LSBS) 2015-2016	The research examined the nature/cost of advice sought and the relationship between 'stated reasons' for accessing external advice and business performance, in terms of business growth, improving business efficiency, productivity and the general running a business	Findings identify accountants as the main private sector providers of information to SMEs. Firms that pay for advice are more likely to be profitable. Asking for advice about training and business growth has a positive impact on profitability, while asking for advice about marketing has a negative impact on profitability
Park et al (2020)	The survey drew on a sample of 42,261 Korean SMEs from Small Business Corporation (SBC) survey over the period of 2006–2011	This study investigates the role of government-sponsored nonmonetary diagnostic and support services in helping Korean SMEs improve their survival and growth in conjunction with government loan financing	The support helped SMEs survive, but did not necessarily help them achieve higher annual assets and sales growth. However, when government-based diagnostic and support services are combined with public loan financing, they prove to be effective in enhancing the Korean SMEs' annual assets and sales growth.
Ogane (2021)	Bespoke Survey of 3011 Japanese start-ups and SMEs	Examines the effects of public and private external advice on entrepreneurs' fundraising and business performance while distinguishing the sources of advice	Advice from managers in the same industries contributes to solving entrepreneurs' fundraising problems. In addition, their advice contributes to increasing the amount of external funding which entrepreneurs obtain at the time of startup. We also find that advice from accountants contributes to increasing external funding for new firms.
Henley (2024)	Analysis of the UK Longitudinal Small Business Survey (LSBS), between 2015-2021	Looks at the types of advice sought and the varying benefits they bring to firms in terms of labour productivity.	Findings show that obtaining business advice, across all forms, raises labour productivity by 10%. The largest impacts are for topics related to legal issues, tax and national insurance law and payments, and regulatory compliance provided by qualified or accredited professionals. By contrast, more subjective advice on more direct drivers of productivity, such as workforce skills, innovation, and management and leadership practice, is not found to deliver SME productivity gains.

Table 1. Variable Description

Variable Name	Description	Source
Any Advice	Dummy variable equals 1 if the business has engaged in any form of external advice within the past 12 months	LSBS K2
Day-to-day Advice	Dummy variable equals 1 if the business has engaged in external advice relating to the day-to-day operation with the past 12 months. Day-to-day advice includes advice relating to employment law, financial advice for general running business, health and safety, legal issues, regulations, tax/national insurance related, training, and workplace pensions.	LSBS K5
Strategic Advice	Dummy variable equals 1 if the business has engaged in external advice relating to boost profitability, numbers employed, and/or productivity with the past 12 months. Strategic advice includes advice relating to business growth, e-commerce/technology, exporting, financial source, business efficiency/productivity, innovation, management/leadership development, marketing, and relocation.	LSBS K5
Both Day-to-day and Strategic Advice	Dummy variable equals to 1 if the business used both day-to-day advice and strategic advice	LSBS K5
Age Group	Age group dummy. 1 = 0-5 years; 2 = 6-10 years; 3 = 11-20 years; 4 = 20+ years	LSBS A6
ONS 12 Regions	UK regions dummy. 1 = East Midlands; 2 = East of England; 3 = London; 4 = North East; 5 = North West; 6 = South East; 7 = South West; 8 = West Midlands; 9 = Yorkshire and the Humber; 10 = Scotland; 11 = Wales; 12 = Northern Ireland	LSBS
Industry	Industry Category by SIC2007. 1 = ABDE - Primary; 2 = C - Manufacturing; 3 = F - Construction; 4 = G - Wholesale/ Retail; 5 = H - Transport/ Storage; 6 = I - Accommodation/ Food; 7 = J - Information/ Communication; 8 = KL - Financial/ Real Estate; 9 = M - Professional/ Scientific; 10 = N - Administrative/ Support; 11 = P - Education; 12 = Q - Health/ Social Work; 13 = R - Arts/ Entertainment; 14 = S - Other service	LSBS A3/A4
Multiple Operation Sites	Dummy variable equals to 1 if the business has more than one operation site	LSBS A1
Log Employee	Natural logarithm of employee	LSBS A2
Log Employment	Natural logarithm of employment. Employment is calculated by adding employee and owner	LSBS A2+A17A2A
Employee Group	Employee group dummy. 1 = Zero Employee; 2 = 1-4; 3 = 5-9; 4 = 10-19; 5 = 20-49; 6 = 55-99; 7 = 100-249	LSBS A2
Log Labour Productivity	Natural logarithm of labour productivity. Labour productivity is calculated by sales over employee.	LSBS P1 A2
Log Sales	Natural logarithm of sales	LSBS P1
Product Innovator	Dummy variables equal to 1 if the business introduced any new or significantly improved goods or services in the last three years.	LSBS J1
Process Innovator	Dummy variable equals to 1 if the business introduced any new or significantly improved process for producing in the last three years.	LSBS J3
Innovator	Dummy variable equals to 1 if the business was a product innovator or a process innovator during the last three years	LSBS J1/J3
Radical Product Innovator	Dummy variable equals 1 if the new introduced goods or services is new to the market	LSBS J2
Radical Process Innovator	Dummy variable equals 1 if the new introduced process is new to the market	LSBS J4
Radical Innovator	Dummy variable equals to 1 if the business did either radical product innovation or radical process innovation	LSBS J2/J4

Table 2. Summary of Statistics of Full Sample, 2015-2022

Category	Variable	Frequency	Percentage	Mean	S.D.	Min.	Max.
External Advice	Any Advice	42569		0.274	0.446	0	1
	0	30897	72.581				
	1	11672	27.419				
	Day-to-day Advice	42569		0.098	0.298	0	1
	0	38384	90.169				
	1	4185	9.831				
	Strategic Advice	42569		0.077	0.267	0	1
	0	39289	92.295				
	1	3028	7.705				
	Both Advice	42569		0.051	0.221	0	1
Firm Characteristics	0	40378	94.853				
	1	2191	5.147				
	Age Group	42569		3.093	1.074	1	4
	0-5	5409	12.706				
	6-10	6518	15.312				
	11-20	9330	21.917				
	>20	21312	50.065				
	Employee Group	42569		3.142	1.878	1	7
	zero	11111	26.101				
	1-4	8860	20.813				
	5-9	5051	11.865				
	10-19	6424	15.091				
	20-49	4908	11.530				
	50-99	3977	9.343				
	100-249	2238	5.257				
	ONS 12 Regions	42569		6.164	3.175	1	12
	East Midlands	2972	6.981				
	East of England	4316	10.139				
	London	4761	11.184				
	North East	1089	2.558				
	North West	3525	8.281				
	South East	6689	15.713				
	South West	4858	11.412				
	West Midlands	3337	7.839				
	Yorkshire & the Humber	2885	6.777				
	Scotland	4106	9.646				
	Wales	1721	4.043				
	Northern Ireland	2310	5.425				
	Industry	42569		6.784	3.676	1	14
	ABDE - Primary	1520	3.571				
	C - Manufacturing	4348	10.214				
	F - Construction	3953	9.286				
	G - Wholesale/ Retail	6674	15.678				
	H - Transport/ Storage	1594	3.745				
	I - Accommodation/ Food	3189	7.491				
	J - Information/ Communication	2762	6.488				
	KL - Financial/ Real Estate	1642	3.857				
	M - Professional/ Scientific	6241	14.661				
	N - Administrative/ Support	3354	7.879				
	P - Education	1344	3.157				
	Q - Health/ Social Work	3032	7.122				
	R - Arts/ Entertainment	1241	2.915				
	S - Other service	1675	3.935				
	Multiple Operation Sites	42569		0.182	0.386	0	1
	Employee	31459		20.423	36.449	0	249
	Labour Productivity	28438		198143.8	1319209	0	4.50e+07
	Sales	38691		2595391	1.05e+07	0	1.50e+09
	Product Innovator	41404		0.509	0.500	0	1
	Process Innovator	36495		0.278	0.448	0	1
	Innovator	42569		0.573	0.495	0	1
	Radical Product Innovator	20747		0.311	0.463	0	1
	Radical Process Innovator	9979		0.218	0.413	0	1
	Radical Innovator	11210		0.653	0.476	0	1
Observations	Total Observations	42569					

Table 3. Estimated Effects of External Information and Advice on Innovation from Bias-Corrected Multivariate-Distance Matching

Innovator	Types of External Information and Advice			
	Any	Day-to-Day	Strategic	Both
	0.152*** (0.007)	0.057*** (0.010)	0.169*** (0.010)	0.169*** (0.011)
Observations	29414	29414	29414	29414

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standard errors are in parentheses.

Table 4. Estimated Short Run Effects of External Information and Advice on Outcomes from Bias-Corrected Multivariate-Distance Matching

Outcome	Labour Productivity	Employee	Sales
	0.088*** (0.023)	0.032*** (0.011)	0.140*** (0.022)
Observations	11213	12410	16006

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standard errors are in parentheses.

Table 5. Estimated Effects of External Information and Advice on Outcomes across 5 years from Bias-Corrected Multivariate-Distance Matching

Outcome	Year after treatment					Observations
	1	2	3	4	5	
Labour Productivity	0.266*** (0.069)	0.278*** (0.067)	0.278*** (0.072)	0.271*** (0.078)	0.221*** (0.076)	1021
Employee	0.015 (0.04)	0.017 (0.04)	0.006 (0.045)	0.055 (0.053)	0.07 (0.055)	1127
Sales	0.245*** (0.061)	0.248*** (0.062)	0.262*** (0.064)	0.263*** (0.073)	0.265*** (0.073)	1598

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standard errors are in parentheses.

Table 6. Estimated Short Run Effects of Day-to-day Advice on Outcomes from Bias-Corrected Multivariate-Distance Matching

Outcome	Labour Productivity	Employee	Sales
	0.080** (0.037)	0.489*** (0.039)	0.874*** (0.051)
Observations	9366	10396	13706

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standard errors are in parentheses.

Table 7. Estimated Short Run Effects of Strategic Advice on Outcomes from Bias-Corrected Multivariate-Distance Matching

Outcome	Labour Productivity	Employee	Sales
	0.109*** (0.038)	0.389*** (0.045)	0.783*** (0.059)
Observations	9033	10018	13301

Note: * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses.

Table 8. Estimated Short Run Effects of both Day-to-day and Strategic Advice on Outcomes from Bias-Corrected Multivariate-Distance Matching

Outcome	Labour Productivity	Employee	Sales
	0.139*** (0.047)	0.470*** (0.053)	0.956*** (0.069)
Observations	8696	9660	12829

Note: * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses.

Table 9. Estimated Effects of Strategic Advice on Outcomes across 5 years from Bias-Corrected Multivariate-Distance Matching

Outcome	Year after treatment					Observations
	1	2	3	4	5	
Labour Productivity	0.217* (0.125)	0.277** (0.122)	0.273** (0.138)	0.181 (0.122)	0.171 (0.136)	789
Employee	0.363** (0.142)	0.321** (0.147)	0.307** (0.148)	0.353** (0.148)	0.380** (0.148)	877
Sales	0.727*** (0.174)	0.749*** (0.172)	0.731*** (0.180)	0.710*** (0.185)	0.762*** (0.182)	1284

Note: * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses.

Table 10. Estimated Effects of Day-to-day Advice on Outcomes across 5 years from Bias-Corrected Multivariate-Distance Matching

Outcome	Year after treatment					Observations
	1	2	3	4	5	
Labour Productivity	0.301*** (0.115)	0.255** (0.113)	0.293** (0.115)	0.204* (0.119)	0.125 (0.129)	855
Employee	0.303** (0.121)	0.342*** (0.122)	0.319*** (0.123)	0.331*** (0.123)	0.375*** (0.123)	946
Sales	0.731*** (0.134)	0.714*** (0.134)	0.783*** (0.139)	0.711*** (0.143)	0.710*** (0.148)	1363

Note: * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses.

Table 11. Estimated Effects of both Day-to-day and Strategic Advice on Outcomes across 5 years from Bias-Corrected Multivariate-Distance Matching

Outcome	Year after treatment					Observations
	1	2	3	4	5	
Labour Productivity	0.221 (0.143)	0.156 (0.156)	0.134 (0.139)	0.185 (0.153)	0.286* (0.158)	832
Employee	0.357* (0.185)	0.370* (0.190)	0.433** (0.186)	0.423** (0.181)	0.501*** (0.184)	751
Sales	0.945*** (0.198)	0.892*** (0.206)	0.996*** (0.208)	0.905*** (0.215)	1.008*** (0.234)	1219

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standard errors are in parentheses.

Table 12. Mediation Analysis Results for Labour Productivity

Mediates	Treatments				Observations
	Any	Day-to-day	Strategic	Both	
Innovator	0.002 (0.003)	0.00002 (0.001)	0.001 (0.008)	-0.005 (0.010)	33734
Product Innovator	-0.003 (0.003)	-0.003 (0.002)	-0.003 (0.007)	0.009 (0.009)	43593
Process Innovator	0.00001 (0.003)	0.0001 (0.001)	-0.007 (0.006)	0.003 (0.008)	32329
Radical Innovator	0.0003 (0.001)	-0.002 (0.002)	-0.001 (0.002)	-0.0003 (0.001)	10195
Radical Product Innovator	0.009*** (0.002)	0.001 (0.002)	0.006** (0.002)	0.007** (0.003)	18462
Radical Process Innovator	0.001 (0.001)	-0.001 (0.001)	0.002 (0.002)	0.001 (0.002)	8858

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standard errors are in parentheses.



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