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The long-term impact of engaged scholarship: how do SMEs capitalise on their engagement with academics to explore new opportunities?

Ainurul Rosli

Westminster Business School, University of Westminster
35 Marylebone Road,
London NW1 5LS
a.rosli@westminster.ac.uk

Muthu de Silva

Kent Business School, University of Kent,
Parkwood Road
Canterbury, CT2 7FS, UK
l.de-silva@kent.ac.uk

and

Birkbeck, University of London
Malet Street,
London WC1E 7HX, UK

Federica Rossi

Birkbeck, University of London
Malet Street,
London WC1E 7HX, UK
f.rossi@bbk.ac.uk

Nick Yip

Norwich Business School, University of East Anglia,
Norwich Research Park,
Norwich, NR4 7TJ, UK
n.yip@uea.ac.uk

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Abstract

We investigate whether—and how—small and medium-sized enterprises (SMEs) are able to capitalise on their engagement with academics in order to explore new opportunities beyond the achievement of the immediate objectives of their collaboration. Using empirical evidence drawn from academic-SME collaborations supported by the Knowledge Transfer Partnership programme in the UK, we find that, for many SMEs, engagement with academics has led to new business opportunities, including new market creation, new project engagement, new venture creation, and new strategic network development. The exploration of new business opportunities is facilitated when three overarching factors are present: i) a capable boundary spanner, who creates bridges within the SME and between the SME and the university, and gains an in-depth knowledge of the collaboration's content; ii) a committed SME leadership willing to allocate resources and permissions to the collaboration, and encouraging an open flow of communication; iii) a strong relationship, characterised by trust and cognitive proximity, between the collaboration's partners, who engage in open discussions and acknowledge and respect their different roles and responsibilities. These findings offer suggestions to SMEs, universities and policy makers in relation to improving the generation of long-term impacts on SMEs through engaged scholarship.

Keywords: *Engaged scholarship; academic engagement; small and medium sized enterprises (SMEs); Knowledge Transfer Partnerships; boundary spanner; new business opportunities*

1. Introduction

This research aims to investigate whether—and how—small and medium-sized enterprises (SMEs) are able to capitalise on their engagement with academics in order to explore new opportunities beyond the achievement of the immediate objectives of their interaction. Since the early 2000s, academics' engagement with practitioners operating in various business and policy contexts has garnered growing interest as a research topic (e.g., Barge et al., 2008; Antonacopoulou, 2010a). The literature has investigated the important role played by academics in bridging the gap between theory and practice (Bartunek, 2007), as evidenced in approaches such as 'mode 2' research (Mitev and Venters, 2009), 'relational scholarship of integration' (Bartunek, 2007), 'triple-helix' interactions (Etzkowitz and Leydesdorff, 2000) and 'practice-based engagement', including action research and participatory research (Van de Ven, 2007; Ram and Trehan, 2009). In particular, the term 'engaged scholarship' has been introduced to specifically describe the involvement of academics in a co-production dialogue with practitioners (Van de Ven and Johnson, 2006; Van de Ven, 2007) and their immersion in close working and learning relationships (Golden-Biddle et al., 2003; Van de Ven and Johnson, 2006) to leverage various kinds of knowledge collectively in order to solve complex problems (Pettigrew, 2001; Van de Ven, 2007; Armstrong and Alsop, 2010).

Since engaged scholarship has the potential to impact a range of businesses and communities (Antonacopoulou, 2010a; Bartunek, 2007), recent research in the field has specifically turned to the process through which such impact is generated (McCabe et al., 2016; Antonacopoulou, 2010b; Hughes et al., 2011). It has been argued that engaged scholarship generates impact through sustained knowledge co-producing interactions (Rossi, Rosli and Yip, 2017) in which all involved stakeholders—

academics, businesses, and other organisations—contribute to the negotiation, validation, and adaptation of knowledge (Brudney and England, 1983). The generation of impact proceeds serendipitously (Rossi et al., 2017) and can unfold over long periods of time as a result of cumulative interactions occurring beyond the initial engagement (Pestoff, 2014).

The characteristics of the process of impact generation suggest that, in order to fully capture the impact of engaged scholarship, it is important to investigate how the parties continue to benefit from the academic-practitioner interaction even after the immediate objectives of the engagement have been achieved. One of the most important ways in which engaged scholarship can achieve long lasting and practice-relevant impact comes to fruition when practitioners are able to capitalise on their interactions with academics in order to explore further business opportunities. However, limited attention has been paid to analysing how the process of academic-practitioner engagement leads to the emergence of new opportunities. The growing empirical literature on university-industry collaborations, which has generated a large amount of evidence on the factors that help such collaborations to achieve their objectives (Siegel and Wessner, 2012), provides very little insight into the issue of how collaborations lead to the generation of new opportunities (Bruneel et al., 2010; Perkmann et al., 2011). Moreover, the few existing studies on the factors that facilitate long-term impact creation through academic and business interactions focus almost exclusively on large companies (Shankar and Barrett, 2005; De Fuentes and Dutrénit, 2012; Motoyama, 2014); very limited evidence exists pertaining to the long-term benefits of engaged scholarship for small and medium-sized enterprises (SMEs) (Bjerregaard, 2009). Indeed, the inclination of SMEs towards generating short-term impacts through their engagement with academics (Fukugawa, 2005) might put into question the possibility of generating

long-term impacts. Hence, we aim to investigate whether—and how—SMEs are able to capitalise on their engagement with academics in order to explore new opportunities beyond the achievement of the interactions' immediate objectives. Addressing this knowledge gap will not only enhance our understanding of the impact of engaged scholarship, but it will also provide useful insights into how such engagement can be organised to maximise impact by enabling stakeholders (including practitioners, academics, policymakers, and their organisations) to put in place conditions, resources, and activities that are particularly relevant for SMEs (Corner and Pavlovich, 2007).¹

Relying on empirical evidence about 68 collaborations between academics and SMEs in the United Kingdom (UK) funded through the Knowledge Transfer Partnerships (KTPs) government scheme, we identify the factors that support SMEs' ability to capitalise on their engagement with academics to explore new business opportunities. The paper is organised as follows. Section 2 reviews the existing literature on the factors that support SME exploration of further opportunities arising from engaged scholarship: we draw on papers that span several streams of literature, including engaged scholarship, university-industry collaborations, and knowledge transfer and co-production. The objective of our later empirical analysis is to broaden our knowledge in this field. In section 3, we present our data and methodology. In section 4, we present our empirical findings. Section 5 concludes with implications for management and policy, and for the research field of engaged scholarship.

¹ Interestingly, the process of creation of a knowledge exchange network involving SMEs and academics has been described in detail, and with a longitudinal focus, by Smith et al. (2010); however, the process is reconstructed from the perspective of the university department that is building the network, rather than from the perspective of the involved SMEs, which instead is the focus of this article.

2. Engaged scholarship and SMEs

To provide the conceptual background for this study, we reviewed the extant literature on the drivers of successful engagement between academics and SMEs, particularly focusing on their long-term impact. This research theme has been addressed by a literature that spans several streams, including engaged scholarship, university-industry collaborations, and knowledge transfer and co-production. These studies have discussed how the achievement of any long-term impact is influenced by business strategies and by the structures and information systems of organisations (Lynall et al., 2003; Lockett et al., 2008; Bjerregaard, 2009; López-Fernández et al., 2016). However, we have limited knowledge of how the relationship-specific factors adopted by SMEs influence the generation of long-term impacts, and particularly the exploration of new business opportunities. The following sections provide a conceptual background for the study: first, by discussing this research gap and, second, by identifying three broad factors that, based on the current literature on the success factors of academic-SME engagement, may influence the exploration of new business opportunities through engaged scholarship.

2.1. Factors that support long-term engagement between academics and businesses

A few studies have taken a long-term perspective to engaged scholarship, focusing on the characteristics of longstanding collaborations between academics and businesses. According to Izushi (2003), long-term engagement is helpful because it ensures the ongoing use of academic knowledge for organisational learning, thus increasing companies' innovative capabilities. This is particularly important for SMEs due to their having relatively limited innovation capabilities in comparison with large companies (De Fuentes and Dutrénit, 2012). According to De Fuentes and Dutrénit (2012), the

forms of engagement that ensure most long-term benefits to companies are R&D projects and consultancies, the licensing of intellectual property rights, and the hiring of recent graduates. Shankar and Barrett (2005) argue that, for engagement to last over time, several conditions must be met: synergies must present, with the universities being able to provide both general knowledge and specialist individuals providing a global perspective; strong personal interactions must be built; one or more intermediary enablers fluent in both cultures and technologies must be involved; and a hierarchical structure in its growth phase must exist (but one that needs to become more flexible over time, with some subgroups being allowed autonomy to either wither or flourish). While interesting, Shankar and Barrett's work is mainly a reflection of the authors' experience as academics engaged with businesses rather than an investigation based upon broader empirical evidence, and it does not specifically focus on the SME perspective.

Besides the studies articulating the factors that promote long-term engagement, a few others have specifically focused on the achievement of business outcomes as a longer-term impact of engaged scholarship. Some have looked at how SMEs capitalise on such engagement to achieve business growth (e.g., Jones and Macpherson, 2006; Love and Roper, 2015). These studies highlight how the limitations faced by SMEs make it difficult for them to do so, suggesting that several aspects must be improved to achieve success. These include: simple, centralised organisational structures; low labour specialisation; informal information systems; ad-hoc/informal approaches to strategy; the use of reactive tactics (Torrès and Julien, 2005; López-Fernández et al., 2016; Lynall et al., 2003; McKelvey, 2006). Although the informality found in SMEs has been highlighted as a barrier for long-term impact generation, some studies have argued that the organisational structure must be flexible enough to adapt to any changes in the

nature and use of collaborative outcomes over time as they are adopted and appropriated (Golden-Biddle et al., 2003).

Bjerregaard (2009) suggested that the ability of SMEs to achieve long-term business outcomes is impacted by their objectives when entering the collaboration: those that adopt an exploitative approach aimed at maximising the immediate, tangible outcomes of their engagement with academics may fail to notice any opportunities to develop and capitalise on learning beyond the scope of the specific collaboration. Conversely, those that adopt an exploratory approach aimed at maximising intangible outcomes—such as practical learning and social relationship building—are more likely to be open to capitalising on any unexpected developments in the collaboration (Jones and Macpherson, 2006). In a study of the longstanding engagement between academics and business in Japan, Motoyama (2014) suggested that, being motivated by learning rather than by the achievement of tangible products, the parties had indeed adopted such exploratory approaches. Bjerregaard (2009) also suggested that those SMEs that adopt exploratory approaches when engaging with academics are more willing to invest in reducing any institutional gaps in organisational cultures, goals, and interests. Moreover, even in the absence of any short-term outcomes, they are more likely to consider a collaboration successful to the extent that it enables them to achieve intangible outcomes not restricted to that particular project (Lockett et al., 2008). Summarising, the few studies that analysed the factors promoting SMEs' capitalisation of their engagement with academics in order to explore further opportunities have pointed to the role played by business objectives (whether exploitative or exploratory) and by the structures and information systems of organisations. Unlike the numerous studies that focused upon the success of engaged scholarship in terms of immediate outcomes, those that focused on long-term impacts have not, to our knowledge,

analysed the relationship between the parties involved in the engagement or the organisation of the engagement process, particularly from the SMEs' perspective. Considering engaged scholarship's aim to embrace any potentialities to deliver impact across a range of businesses and communities through a relational scholarship of integration (Antonacopoulou, 2010a; Bartunek, 2007), this is an important omission. Our empirical findings, focusing on SMEs and on the UK context, are aimed at filling this gap.

2.2. Factors that support SME exploration of business opportunities arising from engaged scholarship

While new business opportunities may arise from managers' alertness to opportunity for gain (Kirzner, 1979), in most cases, recognising opportunities involves a lengthy process of evaluating the suitability of ideas to specific markets (Sarason et al., 2006) for which the knowledge produced through engaged scholarship could be of value. Nevertheless, it could be argued that the identification of new business opportunities may only occur in the presence of an interaction conducive to the exploration of opportunity, particularly in relation to the SMEs' liability of smallness and limited resources (Love and Roper, 2015; Dada and Fogg, 2016). As noted above, the influence of any relationship-specific factors on SMEs' exploration of new business opportunities when engaging with academics has been sparingly discussed in the literature focusing on long-term engagement. Yet, past studies on the success of collaborations in terms of their achievement of immediate outcomes have highlighted the key role played by the relationship between the parties (Comacchio et al., 2012). Hence, by drawing on the extant literature that discusses the influence of relationship-specific factors on collaboration success, we identify three broader areas of further investigation which

may shed light on SMEs' ability to capitalise on engaged scholarship to explore new business opportunities.

First, a strong, transparent (Segarra-Blasco and Arauzo-Carod, 2008), high quality (Van de Ven and Johnson, 2006), and open relationship with academics (Giuliani and Arza, 2009) would help SMEs to achieve mutual trust and effective dialogue (Martin, 2010). Such a relationship would help SMEs to achieve a better understanding of the business applicability of academic knowledge—which has often been highlighted as a challenge (Alvesson and Sandberg, 2013)—and hence to better identify any emerging opportunities. Also, a stronger relationship would limit the development of mismatched expectations between academics and practitioners (McKelvey, 2006; Lockett et al., 2008) whereby companies—and SMEs in particular—tend to seek immediate commercial returns and strong knowledge protection, while academics focus on long-term horizons and on the scientific diffusion of knowledge (Santoro and Chakrabarti, 2002; Izushi, 2003). Better alignment of expectations would result in the generation of collaboration outcomes of better value to SMEs, which, in turn, would increase the chances of using such outcomes for the exploration of opportunities. Furthermore, a stronger and open relationship would also help deal with any communication barriers impeding a genuine and valuable engagement (Giuliani and Arza, 2009; Comacchio et al., 2012), thus facilitating better incorporation of SME needs in the collaboration outcomes, and facilitating opportunity exploration.

Second, the commitment of SME leaders is also crucial, particularly since they have both the power and legitimacy to influence organisational practices (Higgins et al., 2013; Crossan et al., 2017). Literature has highlighted the role played by academic leadership in ensuring that scholars maintain a high degree of commitment not only to the university, but also towards engaging in successful university–industry interactions

(Perkmann et al., 2011; Leigh and Teece, 2016). These studies show that academic leaders with dynamic capabilities are able to encourage individual university members to work harder and improve their commitment to stronger business linkages. Academic leaders can contribute to improving engagement with industry, by defining clear goals and priorities (Siegel et al., 2004), by establishing clear support mechanisms for industry engagement (Azagra-Caro et al., 2006), by providing training and organisational support in managing team expectations (Barnes et al., 2002), and by fostering quality research (Perkmann et al., 2011). While the crucial role of academic leaders in supporting academic engagement has been clearly established, surprisingly little has been discussed in relation to the role played by SME leadership in driving SME-university relationships towards the use of co-produced knowledge for opportunity exploration.

Support from SME leaders is a crucial driver of SMEs' engagement with academics. Very often, SMEs' limited resources make it difficult for leaders to effectively articulate any rationale for growth and long-term strategic direction while buried in day to day operations, and often leads them to privilege the adoption of reactive tactics (McKelvey, 2006; Lockett et al., 2008; Love and Roper, 2015). Hence, in resource-constrained SMEs, only SME leaders that are supportive of engagement with academics will invest effort in strategically planning engagement activities, rather than just focus on immediate business concerns. Moreover, many SMEs have simple organisational structures characterised by low-labour specialisation and centralised and informal information systems (López-Fernández et al., 2016; Lynall et al., 2003). Within these types of structure, the interests of owners, managers, and directors are more closely aligned (Torrès and Julien, 2005); thus, the commitment of leaders is essential for the identification and exploitation of any opportunity of value to the organisation. Higgins

et al. (2013) suggested that, through negotiation, SME leaders should create a temporary working consensus to help shape practices and interactions between employees and external parties. Nevertheless, this has not been dealt with empirically, in particular in relation to understanding the role played by SME leaders in driving relationships with universities for opportunity exploration.

Third, considering the mismatched expectations, practices, and organisational routines between SMEs and academics (Santoro and Chakrabarti, 2002; Izushi, 2003; McKelvey, 2006) and the often limited availability within SMEs of specialist resources for interaction (Love and Roper, 2015; Corner and Pavlovich, 2007; Fukugawa, 2005), capable boundary spanners (Gulati, 2007) could play a significant role in enabling SMEs to capitalise on their engagement with academics to explore new opportunities. The term ‘boundary spanner’ refers to an individual or a team of individuals that possess the “knowledge of who knows what, who can help with what problem, or who can exploit new information” (Cohen and Levinthal, 1990: 133) which not only provides academics with support to better engage with both industry and community, but also helps companies to exploit academic knowledge (Vogelgesang et al., 2010), which would ensure that any co-produced knowledge is of value to SMEs. Bansal et al. (2012) demonstrated that, by strengthening the relationships between academics and practitioners, boundary spanners help to address any conflicts and competing priorities. Boundary spanning activities involve the facilitation of interaction and interdependence between team members (Richter, West, Van Dick and Dawson, 2006), which help the collaborating team to develop greater commitment to their decisions, and to be kept abreast of progress with real time assessments of organisational initiatives (Marrone, 2010). The literature has identified that such boundary spanning roles in collaboration success can be played by university knowledge transfer offices (KTO) and incubators

(Vogelgesang et al., 2010; Comacchio et al., 2012), employees of collaborating companies, academics (Gulati, 2007; Wasserman and Kram, 2009; Bartunek, 2007) and even independent organisations, such as chambers of commerce (Love and Roper, 2015). We expect that the capability of boundary spanners to facilitate the interaction between academics and SMEs could also help in allowing the latter to identify and explore new business opportunities arising from the academic engagement; however, we lack an understanding of how precisely they would facilitate this process.

In summary, building on the literature that explains the successful engagement between academics and SMEs, we have identified three relationship-specific factors adopted by SMEs—namely, the development of strong relationships with academics, the commitment of SME leaders, and the reliance on capable boundary spanners—that may enable SMEs to exploit their interactions with academics in order to explore new business opportunities. Our empirical evidence is aimed at investigating whether these relationship-specific factors do indeed influence the use of engaged scholarship for opportunity exploration and, if so, how.

3. Data and methodology

3.1. Methodological framework

This empirical study relies on evidence drawn from a UK university-industry collaboration scheme known as Knowledge Transfer Partnerships (KTPs). The scheme is funded by 15 UK governmental organisations led by InnovateUK, the UK government's innovation agency. Each KTP involves an academic and a business partner, very often an SME, who recruit and jointly supervise an associate (i.e., a recent graduate) tasked with working within a business to deliver a project that has strategic value for the latter (Ternouth et al., 2012). Each project lasts between 12 and 36 months.

The KTP scheme provided a good context for this research as it is designed to facilitate business innovation while, at the same time, supporting academic research: it thus embodies the ‘double hurdle’ nature of engaged scholarship processes (Starkey and Madan, 2001), which should simultaneously deliver ‘practitioner relevance and scholarly excellence’ (Pettigrew, 2001). In fact, the very nature of the projects requires academics to participate in collective learning processes together with business partners and associates whose perspectives and interest are served (Armstrong and Alsop, 2010), despite the inherent differences in their approaches to innovation (Barnes et al., 2002), culture (Bjerregaard, 2009), and knowledge bases (Siegel et al., 2004; Bartunek, 2007).

We have adopted a mixed methods approach to addressing our research question (Tauscher and Laudien, 2017). In doing so, we position our study in critical realism (Modell, 2009), whose ontological perspective resembles the assumptions of positivism, while its epistemological stance is related to constructivism (Ackroyd, 2000, Sayer, 2000). This approach is beneficial in terms of increasing a study’s reliability and validity (Bisbe et al., 2007) by taking advantage of different research methods (Collins, Onwuegbuzie and Sutton, 2006). Following sections illustrate how we have adopted mixed method approach during both data collection and analysis stages.

3.2. Data collection

3.2.1. Semi structured interviews

To gain insight into the factors that help SMEs to capitalise on academic engagement in order to explore new opportunities, we conducted in depth, semi-structured

interviews with 90 participants who discussed their involvement in 68 KTPs. These interviews were conducted over a 18 month-period between 2013 and 2015. The participants involved in the research included 25 business partners (coded as *BP*), 39 academic partners (coded as *AP*), and 21 associates (coded as *AS*) who had been involved in at least one KTP project, as well as five individuals involved in the management of KTPs at the regional or university level (coded as *KT*). The data obtained from the many actors involved in collaborations enabled us to capture the rich, detailed and meaningful experience of each party rather than relying on the interpretation of a single actor (e.g., an SME), increasing the validity of our findings (Bisbe et al., 2007). Appendix 1 reports the list of interviewees.

Some interviewees were purposefully chosen based on predefined criteria (purposive sampling); their recommendations then enabled the selection of others (snowball sampling). In terms of the academic participants, we included only those who had had experience with two or more KTPs. The business partners and associates were identified by referral and by exploring KTP case studies on university websites.

Semi-structured interviews with open-ended questions can facilitate comparability by providing answers to all questions by all interviewees, and enable probing for more information and the clarification of answers (Louise-Barriball and While, 1994). This approach helped to generate in-depth data on the engagement between stakeholders in the KTPs from different perspectives. Following a retrospective design approach (Berney and Blane, 1997), we also asked the interviewees to reflect on periods both during and after their KTPs to create a greater depth of understanding of the engagement process.

Although we gathered information from business and academic supervisors as well as associates, we acknowledge that there may be a potential for bias from these

individuals, as they may have judged an engagement either by one notable aspect (focusing bias) or by its eventual outcome (outcome bias) (Clark et al., 2008). We took a few steps to counterbalance these problems. First, we involved individuals responsible for managing KTPs at either the university or regional levels; these provided a broader contextualisation of what had occurred during the KTPs to validate and deepen our understanding of the data (Eisenhardt, 1989). Second, two of the researchers had been KTP advisers;² their insider knowledge of the programme thus helped to enhance the trustworthiness of the data (Baxter and Jack, 2008). Another potential problem was posed by the varied professional and educational backgrounds of the participants, which meant that the words used in the questions did not necessarily have the same meaning for every interviewee and that not every interviewee used the same vocabulary (Treece and Treece, 1986). To improve the comparability between interviewees and thus help support the validity and reliability of this study, we focused on the equivalence of meaning—which helped to standardise the semi-structured interviews—as opposed to the repeated use of the same words in each question (Denzin, 1989).

3.2.2. Database of 68 KTPs

The evidence base provided by the interview transcripts was also instrumental to the construction of a database collecting information about each of the 68 KTPs discussed in the interviews. The database in fact included both variables that were built through qualitative content analysis of the interview transcripts (Bell and Bryman, 2007: 310) and variables that were derived from secondary sources. The construction of the former set of variables involved scanning all the interview transcripts in order to score (1 =

² Our KTP samples were independent from the ones in which the two researchers had been involved.

yes; 0 = no) the presence of certain elements, as outlined in Table 1. The construction of the latter set of variables, also outlined in Table 1, involved extracting information from several publicly available online databases: the database of all complete and current KTP projects published by InnovateUK; Scopus, for information on the publications of academic partner, business partner and associate; Espacenet, for information on the patents of the business, the university, and of the academic partner, business partner and associate; the Times Ranking University Guide 2016 for information about the universities' ranking; and the Higher Education Business and Community Innovation survey for information on the universities' support facilities for SMEs.

Insert Table 1 here

3.3. Data analysis

First, the database of 68 KTPs was used to test, by means of a simple quantitative regression model, whether the three factors that we had identified as important in supporting the SMEs' capitalisation of their academic engagement to explore further business opportunities, significantly influenced their likelihood to do so.

Second, qualitative analysis of the interview transcripts was used to further understand 'how' each factor influenced SME capitalisation of new opportunities, by unveiling complex underlying mechanisms. The transcripts were free coded (Bryman and Bell, 2003) and the outcomes of this initial coding were then discussed and agreed collectively by the entire research team (through several iterations of reading and sorting the codes) with the objective to identify the type of opportunities explored by

the SMEs involved in the KTPs, and the factors that had influenced the capitalisation of new business opportunities. By allocating the free codes to the three themes that emerged from the literature review (strong relationship between partners, SME leaders' commitment, capable boundary spanner), and by dividing KTPs into those that explored new business opportunities and those that did not (to ensure that we clearly focused on factors that were present, or more prominent, in the former set rather than in the latter), we found some emerging patterns that distinguished the two types of KTPs. We named these emerging patterns using collective phrases that constituted our sub-themes (Bell and Bryman, 2007). We used NVIVO for the documentation and retrieval of the coding process.

4. Results and Discussion

4.1. Did SMEs capitalise on engaged scholarship to explore new business opportunities?

Our evidence base confirms that several SMEs had capitalised on their engagement with academics in order to explore new business opportunities beyond the immediate collaboration outcomes. For 52 of the 68 KTPs (76%), the interviewees reported some form of exploration of new opportunities. First, some SMEs had entered into new markets largely due to their engagement with academics. The opportunities to open up new markets were due to the potential for the replication or reuse of the jointly produced knowledge, which the SMEs had managed to apply in different contexts after the project, usually supported further by academics:

“We’re going into the pharmaceutical industry, we’re into the ... waste paper industry, we’re going into the newspaper industry and that’s a new one for us.

We're getting into farming, AD bio gas, which is part of the show that we're here today, gas clean up, now there's a major one for the future, gas clean up". [BP 06]

This was not an immediate outcome: one business partner expressed how a company's success in opening up new markets may only have become apparent two or three years after the completion of the project, or even later.

"Defence has been where the company came from but, over the last three to four years, we have kind-of diversified into other markets [after the KTP]. So, to begin with, that was mainly transport—primarily rail." [BP 01]

Second, some SMEs had capitalised on their engagement with academics by initiating new projects; for example a new KTP, another research project, or a business development project of some kind. Successful collaboration around the initial KTP engagement had enabled the output of the project to be contextualised and used in a next project:

"We had ... I think because of that KTP, we had opportunity to work with a second KTP, which gave me the confidence actually to put up my hand when they actually approached me again, you know, two years ago, a lady from another different organisation" [AP 12]

In one case, this had involved sharing the knowledge produced in the KTP at the national level in a subsequent new project. The business and the academic partners agreed that neither could have anticipated beforehand the opportunity to do another project together and to share their project outcome at the national level.

Third, some SMEs had capitalised on their engagement with academics through new venture creation. This had enabled them to diversify into new sectors thanks to the better market understanding they had acquired due to their engagement:

“Talking from our point of view, it’s a way of diversifying into new sectors. Last month, we even launched another company, and the reason for launching is because the products and services that the KTP has developed.” [AS12]

Finally, some SMEs had capitalised on their engagement by developing valuable networks. The collaborative relationships initiated through the KTP had often led to numerous contacts that had developed into relationships, providing further opportunities to apply the knowledge emerging from the KTP:

“You talk about the company, you make some connections, you extend your network of people you have and then, one day, you do projects and new ideas can be brought in.” [AP01]

One example was an instance in which the SME, academic and associate had been able to subsequently work together with a government agency to help create a standard benchmarking exercise to be implemented at the national level:

“But we’re also now impacting ... because we’re working [after the project] with the [Government] Agency on helping them setting their own guidelines on how people should measure things that’s having a much more national impact on how everybody’s performing. [AP25]

Moreover, KTPs had often enabled SMEs to develop the relational competencies needed to engage with other partners, which would likely benefit them in the future.

“I think that the networking capabilities and the facilitation for tapping into other bits of the university is really very useful.” [BP03]

While the entry into new markets and the creation of new business ventures had usually taken at least two or three years after the end of the project to materialise, the engagement in new projects and the development of valuable networks had immediately followed or had occurred during the lifetime of the engagement. All the interviewees who had explored new opportunities had achieved at least one immediate outcome and one long-term opportunity exploration.

“you are effectively bringing the whole organisation along over a two year period, you know, and you’re developing the capability of the organisation rather than just the associate and so what you tend to find at the end of the project is the organisation is far more capable and sharper than before”[AP32]

Having identified the ways in which SMEs had capitalised on their engagement with academics in order to explore new business opportunities—i.e., by (i) entering new markets, (ii) engaging in new projects, (iii) creating new business ventures, and (iv) developing valuable networks—we tried to identify the factors that supported these processes.

4.2. Effect of factors on the SME’s exploration of new opportunities

Using the database of 68 KTP (whose construction is described in section 3.3), we tested whether the factors that we identified as likely determinants of the ability of SMEs to capitalise on academic engagement increased the extent to which SMEs explored new opportunities.

The dependent variable in the linear regression model was a variable called *New_business opportunities*, in which the values were the number of different types of opportunities in which the SMEs had engaged. The values could in principle range from 0 to 4, considering four types of opportunities (as discussed in section 4.1: new projects, new business ventures, new products, and new networks). In practice, companies at most explored three different types of new business opportunities.

We developed several independent variables, listed in Table 2, aimed at capturing the three factors identified as likely to be important for capitalising on engaged scholarship in order to explore new business opportunities—strong relationship between the parties, the commitment of SME leaders, and the presence of capable boundary spanners. The

first factor (strong relationship between the parties) was captured by the variables *Previous collaboration* and *Cognitive_proximity*. The *Previous collaboration* variable captured whether the business partner and the academic partner had already collaborated before the start of the KTPs, since having a continuing relationship typically suggests the presence of mutual trust between the parties. The *Cognitive_proximity* variable indicated whether the business and academic partners had both already been involved in previous KTPs, suggesting that they had already been familiar with the other sector's mode of operating. Trust and cognitive proximity are expected to facilitate communication between the parties and promote the alignment of their expectations . The second factor (commitment of SME leaders) was captured by the *Business_commitment* and *Associate_secondment* variables. The former captured whether the business had been committed to the project, and the latter captured whether the associate had been seconded at the company's premises (this indicates that the SME's leaders had been supportive of the project since they had been willing to accept the associate as full staff member and had allowed him or her to freely communicate with other staff members). Finally, the third factor (capable boundary spanner) was captured by the *Associate_publications* variable, which counted the associates' number of publications: this indicated the associates' ability to engage with university research to effectively bridge between university and industry.

Table 2 provides some descriptive statistics on the dependent variable and on the five independent ones.

Insert Table 2 here

To reduce the number of variables in the regression, we applied a Principal Component Analysis algorithm (Jackson, 2003) to these five variables. The analysis returned three highly significant components with eigenvalues >1 , which cumulatively explained 80% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.52 (>0.5), indicating that the patterns of correlations were relatively compact and that factor analysis should yield distinct and reliable factors. As can be seen from Table 3, the first component loads highly on *Previous collaboration* and *Cognitive_proximity*. This component is highly aligned with the strong relationship factor identified in our analysis. The second loads highly on *Business_commitment* and *Associate_secondment*. This component is highly aligned with the SME leaders commitment factor identified in our analysis. The third loads highly on *Associate_publications*. This component is highly aligned with the capable boundary spanner factor as it identifies an associate with experience in research. Factor scores for each observation—called, respectively *Strong Relationship*, *SME Leaders Commitment* and *Capable Boundary Spanner*—were used as data points for these three variables. These factor scores could be interpreted as the projections of the observations onto the principal components (Basilevsky, 1983). The fact that the Composite Reliability (CR) (Chin, 1988) indices were higher than 0.6 further confirms the reliability of the measures.

Insert Table 3 here

Finally, we also included some controls that, by facilitating successful academic-SME engagement, may have influenced the likelihood to engage in further exploration of opportunities. Since the literature has shown that geographic proximity facilitates the

initiation and successful development of interactions between universities and businesses, particularly by enabling the transmission of tacit knowledge and by supporting the development of trust (Santoro and Gopalakrishnan, 2000), we included a dummy variable equal to one if the university and the SMEs were based in the same region, and zero otherwise (*Geographic proximity*). It has also been shown that individuals who are more experienced at engaging with partners in a variety of institutional settings are more capable of engaging successfully in interdisciplinary collaborations (Santoro and Gopalakrishnan, 2000; Fini et al., 2011). Based upon the assumption that more senior individuals could have developed a greater ability to interact with a variety of partners, we included a dummy variable equal to one if both academic and business partners had been in senior positions, and zero otherwise (*Senior Management*). Intermediary structures, like technology transfer offices, are known to facilitate interactions between universities and businesses (Comacchio et al., 2012). Since these structures are widespread, we included a dummy variable equal to one if the university had facilities designated to provide assistance to SMEs, and zero otherwise (*Uni-SME Assistance*). Finally, further business opportunities can be influenced by the quality of the academic institution (collaborations with more prestigious institutions may open up more opportunities for SMEs) and the knowledge content of the collaboration. Hence, we included the ranking of the university (*University Ranking*) and the field of knowledge of the KTPs (*Science, Technology, or Management*). To account for possible SME heterogeneity, we also controlled by the size of the SME: whether it was a micro firm with less than 10 employees (*Micro*), a small firm with less than 50 (*Small*), or a medium-sized firm with less than 249 (*Medium*).

The OLS regression performed on the dependent variable *New business opportunities*

is reported in Table 4, column 1. In Table 4, to check the robustness of our results, we also report the probit regressions performed on the variables *New business opportunities_D1*—which takes value 1 if the SMEs had explored more than one type of new business opportunity and zero otherwise (column 2)—and *New business opportunities_D2*—which takes value 1 if the SMEs had explored more than two types of new business opportunity and zero otherwise (column 3).

Insert Table 4 here

The results suggest that the relational, leadership and boundary spanner factors are significant predictors of a SME's degree of engagement in the exploration of new opportunities (column 1). The signs and significance of the coefficients of these variables are confirmed in column 3.³ Among the controls, *Geographic Proximity* strongly increases the extent of exploration of new business opportunities, which confirms the importance of personal interactions. Interestingly, the seniority of the academic and business partners has a significantly negative effect on the exploration of new business opportunities. This might suggest that, although they interact easily with one another, more senior partners have well defined research and business objectives that may lead them to take more exploitative approaches to engagement, which precludes the exploration of novel avenues (Bjerregaard, 2009). The ranking of the university and its service provision to SMEs, the size of the SME and the technology area of the KTP are never significant. This suggests that relationship-specific factors

³ The lower significance values found in column 2 are probably due to the lower variability of the dependent variable, with 52 out of 68 projects having explored at least one new business opportunity (instead, 27 out of 68 explored at least two, and 5 out of 68 explored three; none explored all four types of opportunities).

are more important than organisational characteristics and sectoral features in determining the extent of exploration of new business opportunities.

Of course, establishing that such factors play a significant role in the likelihood of engaging in the exploration of further business opportunity is only part of the story; we were also interested in explaining how they do so. Hence, we used qualitative evidence to investigate how each of these factors influences a SMEs' ability to capitalise on engaged scholarship for opportunity exploration, which enabled us to unveil the complex underlying mechanisms driving opportunity exploration.

4.3 How relational, leadership and boundary spanning factors influence opportunity exploration

4.3.1. Relational factors

Relational factors pertain to the relationship between the academic, the associate and the SME's staff involved in the engagement process. The quantitative analysis presented in section 4.2 confirmed that strong tripartite relationships between the parties, based on mutual trust and cognitive proximity, had facilitated the exploration of new business opportunities. But what specific processes had underpinned these links?

(i) Mutual understanding of each other's different competences and roles. The first important way in which the presence of a strong relationship had facilitated opportunity exploration was the mutual recognition that the academic and the SME partners had had different competences and clearly delimited roles to play in the collaboration; this may occur when the cognitive proximity between the parties enables them to acknowledge and respect the other's competences. This mutual understanding and

respect for their different roles, enabled the parties to explore their differences more openly and use them productively. One academic stated this:

“He recognised that we have [conflict] here. He [the business partner] was quite happy to acknowledge the expertise of others because he knew he had expertise himself. He was very well respected in the company, he did not feel in any way threatened by, for example, the associate.” [AP19]

Such acknowledgement of the parties’ different competencies and objectives enabled a more creative exploration of the opportunities that may be opened up by integrating them. In this process, the SMEs’ urgency to achieve short-term objectives had been acknowledged within the remit of a potential long-term opportunity exploration. The discussion had focused upon how these different competencies and objectives could be capitalised upon to address common problems, rather than upon negotiating what role each should play in the collaboration:

“[The business partner] brings together people from practice, from a variety of industries, supposed to encourage transferability amongst these industries and find commonality in similar problems, you-know, nothing’s discussed that can’t be discussed and it’s all done in a safe environment.” [AS02]

By contrast, a case that had not led to the exploration of further opportunities had been marred by a lack of clarity on the role of the academic, who had ended up being dragged in a conversation around matters that only concerned the SME:

“...it clearly enormously affected the relationship and strained the partnership and it was particularly difficult for my colleague ... who is herself an academic but was also very involved in the business, and she was really stuck in the middle and merely I’m talking about things we don’t need to know” [AP11]

In another case that had not led to further exploration of opportunities, the SME clearly had not acknowledged the competencies of the academics and had hence failed to make the most of their differences:

“You can’t make them do anything different, you know. It was just never gonna work, and they basically weren’t interested in the experience that myself and my colleague, who was the academic supervisor, had. My colleague [an academic], used to be a production manager in a X company. They weren’t interested in that. They knew everything and nothing. [AP21]”

(ii) Openness. The second emerging sub-theme involved the parties being able to openly discuss their problems in order to find ways to solve them, which had been made possible by the presence of a degree of mutual trust. In this instance, the SMEs’ relational management competencies had helped the process of joint exploration of potential solutions, which had often led to the creative identification of new opportunities:

“I think we had some really good debates about how stuff could be applied within the industry and how it couldn’t be, and what you could do with customers and what you can’t do with customers. So I think the transfer was through debate and dialogue and that built understanding and then, from that understanding, then you can build artefacts that you can then use. So I think it goes through a series of stages, I think—the transfer” [BP01]”

By contrast, a lack of trust was explicitly mentioned as a problem in at least one case that had not led to the exploration of further opportunities:

“I think they thought we didn’t know enough about and so on. So that’s been an ongoing problem because I was saying earlier about: what do you mean by partnership really? It didn’t always feel like a partnership although he tried on the surface to keep good partnership relationships. We did feel very often that... that we weren’t trusted actually... that we weren’t trusted.” [AP11]”

Hence, the exploration of new business opportunities had been facilitated by the presence of a strong relationship between the academic and business partners; a relationship built on mutual trust (which had enabled them to openly discuss their problems in order to find ways to solve them) and on cognitive proximity (which had enabled them to understand their different competencies and roles in the relationships). The SMEs' openness to appreciate and adopt relevant practices and develop a strong relationship with the academics had thus been of paramount importance.

4.3.2. SME leadership factors

Leadership factors pertain to the support that the SME leaders provide to the engagement process. Support from SME leaders turned out to be very important for the SMEs' ability to capitalise on the academic engagement in exploring further opportunities. The analysis of the SME leadership factors underpinning opportunity exploration led to the emergence of two sub-themes: (i) resources and permissions and (ii) ongoing communication.

(i) Resources and permissions. The SMEs' limited resources and the close alignment of interests between owners, managers, and directors had meant that the SMEs' leadership's support had been crucial to ensure that the associates would be provided with adequate resources and permissions to do whatever would be necessary to succeed in their role.

“Yeah, and I have to say that this is where I feel lucky because both [Director A] and [Director B] understand the value of the KTP and actually want me to use the budget, use the time, go out there and go to conferences and meet with people. It's not about restricting what I do; it's about encouraging me to do whatever I feel is necessary.” [AS12]

Such permission to do whatever would be needed to succeed also extended to the trialling of new ideas, which could naturally have led to the exploration of new opportunities:

“And it was all down to, as you said, the enthusiasm of the man at the head, at the helm, as to whether he wanted to devote time to it or saw some value in it. For me, it was being given a fantastic experience to be able to apply the knowledge that I’d built-up over the last three or four years [in the KTP]. Because it was a smaller company, there was ease of access to key decision-makers, which there wouldn’t necessarily have been within bigger companies ... I was able to directly talk to the key decision-makers within the company to get those [new project] ideas implemented or at least trialled”. [AS11]

It also helped that supportive leaders had put forward the right people, with the right competencies, skillsets, and motivation to help explore opportunities.

“We really didn’t have any structure to the way that we, kind of, sold, or the way that we delivered, or the way that we, kind of, had it ... we didn’t have any IP; it was all about good people really”. [BP01]

By contrast, a lack of SME leaders’ support would have been likely to cut short any further exploration and diminish the impact of the academic engagement:

“Yes, they did not support us anywhere near enough. I would go as far as to say that I actually believe quite a lot of the ... maybe failure is too strong a word but, like lack of impacts, I would actually link directly to that lack of support towards us. We constantly felt like we were fighting against a lack of support within the organisation, a lack of understanding of what we were trying to do. There were one or two senior managers who specifically didn’t like us, didn’t like what we were doing, thought that the project was a waste of money and went out of their way to be as awkward as possible for us; definitely, yeah. [AS08]

(ii) Ongoing communication flow. Another important leadership factor enabling the exploration of new opportunities had been the support given by the SME leaders in maintaining an ongoing flow of communication not only between the people directly involved in the running of the KTP, but also between the different levels in the companies' hierarchy.

“I mean, if I ever want to sit with him [the Senior Management] I can and it's just a very open relationship. I'd like to think, if they wanted to come and see me, it's the same way.” [AS12]

Typically, this ongoing flow of communication within the SME could only have happened if their leaders had been committed and fully supportive of the project; for example, by being willing to treat the associates as full members of staff and by allowing them to fully engage with colleagues.

“The idea that some companies have got more capacity to absorb new knowledge than others—and I think that's something to do with the leadership of the company; whether they are enthusiastic about the idea of getting new knowledge in” [AS11]

Several KTPs that had gone on to explore further opportunities had been characterised by an ongoing flow of communication both within the KTP team and between the KTP team and the rest of the company:

“But I'm really lucky to have a real close knit team for my KTP, [The academic advisor] from the university is my technical adviser. I have weekly meetings with him and they are really informative. I have regular monthly meetings between the industry team and the KTP team as well.” [AS12]

“The tacit knowledge, out of people's heads, and they actually put an intranet into the organisation and they put all of the information there so anybody could share it.” [AP33]

Such ongoing communication had helped with the circulation of ideas, and with the creative identification of new opportunities, wherever these had presented themselves. By contrast, in a case in which opportunities had not been explored, the individuals at different levels of the hierarchy felt that they could not make a significant impact with their ideas:

“We’ve had it on the KTP, it hasn’t all been plain sailing, it was when it first started and we thought we’ll have this sold in six months, it’s a two year KTP. We had real difficulties in growing a particular culture, it just didn’t work.”
[AP01]

“It’s one that I think is in danger of potentially being not as massive as perhaps I’d hoped at the beginning and the reason for that is that because I’m only a middle ranking officer... if it was a very senior manager or a Chief Exec, it would enjoy a much higher profile than it probably does but you know, I just come up with the ideas you know [laughs]” [BP04]

Hence, since, on average, SMEs are ‘poorly managed’ and ‘hard to reach’ (Clarke et al., 2008: 737), SME leaders’ support for the project had been crucial for the exploration of new business opportunities. This was because only supportive SME leaders would have been willing to put up the necessary resources and to give the necessary permissions for the KTP team to achieve its objectives, to allow and encourage an ongoing flow of communication within the KTP team and between it and the rest of the company.

4.3.3. Boundary spanner factors

The third factor pertains to boundary spanning. By construction, the KTP scheme includes associates who are expected to act as boundary spanners between academia and SMEs —reducing the cultural, organisational, and cognitive distance between

them. The role of the associates, who had acted as independent parties between the partners, had been crucial for the success of the engagements.

“So, actually working with X, a youngster, bright, intelligent, wants to kind-of get on in life ... he joined us fresh from his Master’s, this was his first full-time professional role and he developed quite a lot during the course of the KTP—that was a value for us because that made a change for us in the way that we thought about things. We also had to treat the KTP seriously.” [AP08]

The associates had played an important role in helping the different parties to communicate despite their different ‘languages’:

“You had to change the language you were using to describe those so that people got it. Basically, they weren’t willing to accept that, if you like, and not readily adopt that way of thinking and talking and writing” [AS03]

When they had succeeded in doing this effectively, the associates had helped the parties to come together behind shared objectives, which had driven the success of the engagement process:

“However, the real challenge in the KTP, I think, is that you get that integration and you can have the associate, the university and ourselves all heading in the same direction—that is the challenge—and something productive comes from it for all.” [BP05]

Nevertheless, the presence of boundary spanners, with their ability to get the parties to communicate and share the same goals, could not have been sufficient, in itself, to enable SMEs to capitalise on their engagement with academics to explore new business opportunities. The analysis of the boundary spanning factors underpinning opportunity exploration led to the emergence of two sub-themes that appeared to make a difference:

(i) promoting collective involvement and (ii) gaining in-depth knowledge.

(i) promoting collective involvement. The ability of the boundary spanners to get most people within the SME, at different hierarchical levels, to buy into the project rather than just the business advisor, was crucial. Enthusiasm for the project could then have led to greater openness to the exploration of any other opportunities arising from it:

“It’s to encourage staff to get involved and to support the staff who do choose to get involved.” [AP21]

“It’s the enthusiasm within the company to take on board the opportunities, really, that is important”. [AP31]

In those cases in which the KTP had led to the exploration of further opportunities, associates had been aware of the importance of playing a boundary spanning role within the SMEs, promoting staff involvement in the project, and not just between the SME and the university. In this process, the associate, as boundary spanner, had been more credible because he or she had had no prior affiliation (i.e., had been specifically recruited for the project) with either the university or the company:

“I think, longer-term, from [a company] perspective ... to be having quite a significant impact, we’re starting to become more profitable ... are starting to come to fruition now ... because it was about business change, you had to work very closely with those who ran and controlled and were going to shape the business” [AS03]

When, often for reasons beyond their control, the boundary spanner had failed to get relevant parties in the company behind the project, the impact achieved had been small:

“We were starting to modernise the way the business was working and then became very resistant to that; and so that was then a very difficult project to draw any really success out of and particularly difficult for me [the associate], who was kind-of stuck there trying to deliver something that then wasn’t really wanted.” [AS03]

“When small businesses—normally, family businesses—are involved in KTP and then you have some people having different thoughts about how things should be done within the company, that somehow affects also the success of the KTP itself.” [AP01]

(ii) Gaining in-depth knowledge. Another important factor in the SMEs’ ability to capitalise on academic engagement to explore further opportunities had been the boundary spanner’s deep understanding of the project and of its potential. This had been facilitated by the boundary spanner’s strong familiarity with the field of knowledge around which the project was developed; for example, through having themselves done research work in the area, or having demonstrated a strong willingness to learn. When the boundary spanner had not just mediated between the academic and business partners, but had gained a profound knowledge of the project, he or she had been able to spot opportunities that they were best placed to advocate and to drum support for:

“So, after our KTP was done, we were left with a kind of basketful of ideas of where to take it next. So that’s why we [the academics and business] stayed on with it actually; because, after those first two years, we had accomplished what we set out to do but realised that, actually, there was so much more potential. I think we see it very much as having a very capable person who can understand [the project] ... Absolutely yes so x [an employee] is the one who is going to be taking that on board”. [AP29]

In one case, the SME had taken advantage of the associate’s knowledge to develop in-house expertise which had enabled it to capitalise further on the KTP:

“She [the associate] has not only fulfilled the project brief; the important thing is... so she’s absolutely brought her skill set in the field into the company, so people are learning from her and there is an absolute transfer of that knowledge. We [the business] have been invited by [the government agency], for instance, to help as part of their coalition ... we wouldn’t get that unless we knew what we were talking about, and the calibre of the people we have on board and the

knowledge that's been transferred into the company allows us to be part of that and that's influencing the industry. [BA06]

That SME had got a lot out of the project; it had done so thanks to new capacities that had enabled it to mobilise the influence in the new business opportunities that it had created with the university and the associate, so much so that it had felt like “*more than just two years' work from the associate*” [AP08]. By contrast, when the boundary spanners had not been willing to learn as the project developed, they had failed to identify further opportunities.

“A nice guy, but he didn't have a lot of self-confidence and I think he was overawed by what he had to do, and he wouldn't stand up and pass on an opinion—he was too sheepish, really, to do that” [AP31]

Hence, the boundary spanners had facilitated the exploration of new business opportunities when they had been able to get buy-in for the projects across the SMEs' hierarchical levels—which had created widespread enthusiasm for the project and had then led to greater openness towards the exploration of any other opportunities arising from it—and when their in-depth knowledge of the projects' contents had enabled them to spot and pursue any interesting opportunities that emerged.

Figure 1 summarises the factors and underlying mechanisms that we found to have been important in supporting the SMEs' ability to explore any new opportunities emerging from academic engagement. Of course, these factors had not been working in isolation: rather, they had tended to positively feed upon each other in complex ways so that the greater the extent to which they had all been present, the more favourable had the conditions been for the SMEs to capitalise on their academic engagement.

Insert Figure 1 here

5. Conclusion

This article makes three original contributions to the engaged scholarship literature by unveiling how SMEs make use of their engagement with academics to explore new business opportunities beyond the achievement of the immediate objectives of the interactions. Our contributions, discussed below, provide a new perspective to the past research that highlighted the lack of possibility of long-term impact generation through SME-university interactions due to the SMEs' natural resistance to long term projects and to their inclination to search for solutions to immediate problems (McKelvey, 2006; Fukugawa, 2005; Santoro and Chakrabarti, 2002). We highlight instead that those SMEs that exhibited certain behaviour patterns were able to overcome such SME specific obstacles as they sought to exploit their engagements to explore new business opportunities, enabling them to generate long-term impacts. These new opportunities include new market creation, new projects engagement, new ventures creation, and new strategic network development.

First, our findings extend the discussion on the role of boundary spanners in university-business interactions. Past research on such role had mainly highlighted the role played by 'institutions'—such as the Knowledge Transfer Office (KTO) (Comacchio et al., 2012)—in which the notion of individuals' taking on the role of boundary spanners in support of engaged scholarship aimed at supporting the SMEs' capitalisation of opportunities was suggested (Gulati, 2007; Bartunek, 2007) but, to our knowledge, neither empirically tested nor explored in detail. Those conceptual papers on 'individuals' as boundary spanners mainly discussed the roles played by academics and practitioners moving between academia and practice (e.g., Gulati, 2007; Wasserman

and Kram, 2009). The originality of our study resides in the fact that it highlights: (1) the role played by associates as independent parties who are employed neither by SMEs nor by the universities prior to starting the collaborations; and (2), particularly, their role in facilitating the exploration of business opportunities. As a boundary spanners, associates are engaged in the opportunity exploration phase and also in convincing the SMEs of the importance of generating long term impacts through the projects, which is crucial in overcoming the SMEs' inherent inclination to mainly generate short-term tangible outcomes (Fukugawa, 2005) through engaged scholarship. In particular, it emerged that the recognition of associates as 'independent' and 'neutral' parties with in-depth knowledge of the collaboration resulted in securing their presence as credible and 'trustworthy' voices within the projects, which facilitated their bridging role within the SME and between the "two poles" of academics and practitioners (Bartunek, 2007: 1329). This contribution has important implications for parties involved in the relationship as to how to define and support success criteria of an associate (i.e. acting as a boundary spanner), which will encourage and incentive associates to play this crucial role, and as a result, ensuring the generation of long-term value by SMEs.

Second, we contribute to the engaged scholarship literature by highlighting the role played by SME leaders' commitment in ensuring the generation of long-term value. While past research discussed the importance of academic leadership commitment for the success of university-business interactions (Perkmann et al., 2011; Leigh and Teece, 2016), it had not sufficiently explored the specific ways in which SME leadership commitment enables SMEs to capitalise on the knowledge produced through engaged scholarship for opportunity exploration. Our study highlights how SME leaders' commitment facilitates the open flow of communication across the organisation, which ensures the wider engagement of the SME for opportunity exploration beyond those

who are actively engaged in a collaboration project. Also, considering the SME leadership's centrality (Torrès and Julien, 2005; Higgins et al., 2013), its commitment is found to be important to secure relevant specific resources and permissions for opportunity exploration. As a result, engaged scholarship can overcome the challenges that hinder the generation of long-term impacts—such as the liability of smallness (Dada and Fogg, 2016) and the limited availability of specialist resources (Love and Roper, 2015; López-Fernández et al., 2016; Corner and Pavlovich, 2007). This finding offers important suggestions to SMEs on how their leaders should aim to capitalise on engaged scholarship to generate long-term impacts beyond immediate collaboration outcomes. Also, this highlights the need for policy makers/funders to support SME leaders to develop relevant skills and capabilities in addition to the monetary contribution, so that, the value or money invested would be greater.

Third, we highlight how strong relationships between SMEs and universities, comprising cognitive proximity and trust, ensure sustained knowledge co-producing interactions that can proceed serendipitously and unfold over long periods of time (Rossi et al., 2017). While our findings support those past studies that argued that strong, transparent (Van de Ven and Johnson, 2006), and high quality interactions (Martin 2010) may help to develop trust and shared understanding (Santoro and Gopalakrishnan, 2000), our original contribution is to highlight how such strong relationships enable SMEs to explore new business opportunities. In fact, our findings suggest that successful collaboration is not only a matter of ensuring the presence of complementary knowledge, as illustrated by previous studies (e.g., Santoro and Gopalakrishnan, 2000; Barnes et al., 2002), but, more importantly, involves the acknowledgement and respect by both parties of their complementary competences and roles. It is evident that trust and cognitive proximity help SMEs to realise the value of

academic knowledge and allow them to openly discuss how to solve SME-specific challenges, in ways that ensure that the knowledge produced through engaged scholarship is of value for opportunity exploration. This contribution emphasises the importance of adopting relevant practices and cognitive processes (including supporting the adoption) by SME, universities, associates and policymakers/funder in order to generate long-term impacts through engaged scholarship.

Additionally, to the best of the authors' knowledge, this is one of the few studies to have focused on the multi-actor nature of engagement (e.g., Clark et al., 2008; Mitev and Venters, 2009), capturing the rich, detailed, and meaningful experience of engaged scholarship from the perspective of those academics, business partners, associates, and managers. In doing so, it answers calls to provide a clearer understanding of successful and beneficial engagements, particularly with SMEs (McCabe et al., 2016; McKelvey, 2006; Bartunek, 2007).

Past research highlighted that the SMEs' operational duties do not allow them to become fully engaged with academics (Murray and Stern, 2007), let alone take on the role of 'academic-practitioner' boundary spanners (Gulati, 2007; Bartunek, 2007). Our findings provide some suggestions to help overcome this challenge. In particular they suggest that several mechanisms could be put in place to create a supportive environment (Fini et al., 2011) in which SME-academic engagement can generate impact beyond the achievement of project outcomes. Hence, schemes similar to KTPs should be designed to enable this tripartite relationship to lead to the generation of long term opportunities, and specific consideration should be given to how these are resourced and supported. First, it would be important to ensure that SMEs' leaders are committed to the project, including their willingness to commit own resources and give permissions to explore further opportunities, as well as their willingness to ensure an

open flow of communication about the project within the SME. Second, it would be important to include a boundary spanner external to both the SME and the university, whose selection could include criteria like the ability to engage in boundary spanning within the company and between the company and academia, and to gain in-depth knowledge of the project's contents. Third, practices to nurture the relationship between academia and SME could be implemented to ensure that both parties understand each other competences and different roles, and to promote open discussion.

This research has limitations to consider. Firstly, the evidence was collected in a single country—the United Kingdom, and from the very specific case of the Knowledge transfer Partnership (KTP) programme. This helped with the control of the national context, and also with the type of engagement on which we focused. Future research from other countries would be important, as the evidence has shown that different countries provide different kinds of policy support and incentives for SME-academic engagement (Rosli and Rossi, 2016). Secondly, we used a retrospective design in which the participants reflected on periods both during and after their KTPs. This highlights the potential for recall bias; although this is not an easy issue to resolve, research has also showed that, even after several years, the recalling of events can be accurate and useful for research purposes (Berney and Blane, 1997). Third, while we looked at leadership as a single construct, future research could explore the influence of SME leadership structure; e.g., in terms of the alignment/divergence of interests between owners, managers and directors (Torrès and Julien, 2005) in relation to their commitment to engage with academics to explore and exploit future opportunities, particularly since literature has shown that SMEs are fundamentally different from one another (Gibb, 2009). Fourth, despite controlling for the size of the firm, this study did not address the effect of the heterogeneity of SMEs. Yet, past research highlights the

heterogeneity among SMEs (e.g. Curran and Storey, 2002; Smallbone and Welter, 2001; Robson and Bennett, 2000), and thus, there is a need for future research to investigate the influence of SME heterogeneity on the generation of long-term impacts through engaged scholarship. Fifth, we have highlighted the long-term value generated by SMEs through this tripartite relationship and there is potential for future research to investigate the long-term value derived by associate, the university and the funder.

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Table 1: Variables construction for the database

Variables built through quantitative content analysis of the interview transcripts	
(i)	whether the academic and business partners had had previous KTP and industry experience;
(ii)	whether the academic and business partners (and the associates) had collaborated prior to the KTP, and whether they continued their collaboration after the KTP;
(iii)	several aspects of the governance of the collaboration (whether the associates worked at the business's premises; whether there were regular project meetings; whether the business was committed to the project; whether communication within the project was effective);
(iv)	whether the KTP benefited the universities (in terms of further projects, more publications, and new teaching activities), the businesses (in terms of increased reputation, economic outcomes, more interactions, more training, and additional investment), or the associates (in terms of employment in the business);
(v)	whether the businesses explored new opportunities after the KTP (in terms of new projects, new ventures, new products, and new networks,).
Variables extracted from publicly available online databases	
(i)	information about the participants (the academic and business partners' names, their addresses, and business sizes and sectors) and about the KTP project (objective, knowledge field, grant amount, funding body), extracted from InnovateUK's online database;
(ii)	the number of publications and co-publications edited by the universities, businesses, academic and business partners, and associates (extracted from Scopus) and the number of patents and co-patents registered by the universities, businesses, academic and business partners, and associates (extracted from Espacenet);
(iii)	the universities' ranking (from the Times Higher Education Ranking Guide 2016) and whether they had an enquiry point for SMEs and provided assistance for SMEs (from the Higher Education Business and Community Innovation survey).

Table 2. Descriptive statistics and differences in means

Variable name	N. obs.	Mean	Standard deviation	Min	Max
<i>New_business_opportunities</i>	68	0.28	0.45	0	3
<i>Previous_collaboration</i>	68	0.25	0.44	0	1
<i>Cognitive_proximity</i>	68	0.93	0.26	0	1
<i>Business_commitment</i>	68	0.96	0.21	0	1
<i>Associate_secondment</i>	68	1.16	2.78	0	14
<i>Associate_publications</i>	68	0.28	0.45	0	1

Table 3: PCA to construct the independent variables to be used in the regression

	Variable	Comp1	Comp2	Comp3	Comp4	Comp5
Strong_relationship (CR= 0.606)	Previous_collaboration	0.66	-0.21	0.15	0.08	-0.70
	Cognitive_proximity	0.66	-0.22	0.05	0.06	0.71
SME Leaders Commitment (CR= 0.608)	Business_commitment	0.14	0.71	0.12	0.68	0.02
	Associate_secondment	0.25	0.61	0.22	-0.72	0.01
Capable Boundary Spanner	Associate_publications	-0.21	-0.19	0.95	0.06	0.07

Table 4. Factors that influence the extent to which SMEs explore new opportunities

VARIABLES	(1)	(2)	(3)
	new_business_ _opportunities	new_business_ opportunities_ D1	new_business_ opportunities_ D2
Strong Relationship	0.200** (0.084)	0.244 (0.228)	0.431*** (0.162)
Capable Boundary Spanner	0.205* (0.104)	-0.006 (0.249)	0.560** (0.264)
SME Leaders Commitment	0.228** (0.101)	0.705*** (0.241)	0.252* (0.192)
Geographic Proximity	0.511* (0.280)	1.201** (0.502)	0.653 (0.536)
University Ranking	-0.036 (0.051)	-0.035 (0.102)	-0.031 (0.095)
Uni-SME Assistance	0.188 (0.357)	0.331 (0.649)	-0.040 (0.680)
Senior Management	-0.593** (0.272)	-0.848⁺ (0.548)	-1.234** (0.543)
Science	-0.284 (0.301)	-0.491 (0.658)	-0.417 (0.545)
Tech	-0.051 (0.235)	0.175 (0.505)	0.086 (0.441)
Micro	0.008 (0.329)	0.387 (0.786)	-0.105 (0.558)
Small	0.021 (0.215)	0.196 (0.462)	-0.288 (0.412)
Constant	0.905** (0.438)	-0.167 (0.826)	-0.285 (0.797)
Observations	68	68	68
R-squared	0.340	0.37	0.261
	F(11, 58) = 2.62, Prob>F 0.009	LR chi2(11) = 27.47 , Prob>Chi2 = 0.004	LR chi2(11) = 23.85 , Prob>Chi2 = 0.013

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, +p<0.2

Figure 1: Specific drivers to capitalisation to explore new business opportunities

