

*Organizational learning, entrepreneurial orientation, and the role of university engagement in SMEs*

Olufunmilola (Lola) Dada<sup>1</sup>, Helen Fogg  
Lancaster University Management School, UK

The authors gratefully acknowledge the financial support of the Lancaster University Research Committee. An earlier version of this paper was presented at the 35<sup>th</sup> *Annual Institute for Small Business and Entrepreneurship (ISBE) Conference, Dublin, November 7–8 2012* where it was short listed for two awards: (i) Best paper in the track: Entrepreneurial Learning in Organisations, and (ii) Best Knowledge Exchange and Transfer Paper. We are grateful for comments from the conference paper reviewer and conference participants.

<sup>1</sup> Corresponding author. Tel: +44 (0) 1524 510711; Fax: + 44 (0)1524 594743; Email: [l.dada@lancaster.ac.uk](mailto:l.dada@lancaster.ac.uk).

# **Organizational learning, entrepreneurial orientation, and the role of university engagement in SMEs**

## **Abstract**

This paper seeks to understand the effect of entrepreneurial orientation (EO) on organizational learning (OL) in small and medium-sized enterprises (SMEs) and the role of business/university engagement on the relationship between these two constructs. A cross-sectional research design, involving a mail questionnaire survey, was employed to collect data from a sample of 206 SMEs operating in the UK. The results obtained from both the regression and moderated regression analyses revealed that EO positively impacts the level of OL in SMEs. In addition, business/university engagement was found to be a significant moderator in this relationship. These findings provide important academic, practitioner and policy implications.

**KEYWORDS:** organizational learning; entrepreneurial orientation; business/university engagement; SMEs.

## **Introduction**

The degree to which entrepreneurial orientation (EO) has a positive, direct impact on organizational learning (OL) in small and medium-sized enterprises (SMEs), and the moderating effect of business/university engagement upon EO–OL SME relationships is of critical importance (Spicer and Sadler-Smith, 2006; Wiklund et al., 2009; Sanzo et al., 2012; Real et al., 2014). Understanding the dynamics of such relationships is necessary to evaluate and analyze the mechanisms through which OL can be promoted in SMEs as well as the value of business/university engagement. OL has been conceptualized in the literature as a “dynamic process of creating, acquiring, and integrating knowledge in an attempt *to develop resources and capabilities that will enable the organization to achieve better performance*” (Sanzo et al., 2012: 702). It is the basis for attaining a sustainable competitive advantage as firms that are proficient in learning have an improved chance of identifying events and trends in the marketplace, are generally more flexible and are able to respond more rapidly to challenges (Jiménez-Jiménez and Sanz-Valle, 2011).

OL is of interest within the context of SMEs (Spicer and Sadler-Smith, 2006; Sanzo et al., 2012), given their critical contribution to the contemporary global economy (Simpson et al., 2011). Despite their significance, however, SMEs also have liabilities of newness, smallness and inexperience (McDougall et al., 2003; Wright et al., 2007; Li et al., 2011; Tang, 2011); as such, they are susceptible to turbulent and challenging environments (Spicer and Sadler-Smith, 2006). Accordingly, drawing upon appropriate OL assists SMEs to anticipate and accommodate market volatility. Indeed, it has been argued that the capacity to learn organizationally is critical to the success of SMEs (Spicer and Sadler-Smith, 2006). Longitudinal and historical studies have found OL to be influential in the growth of small firms (Hansen and Hamilton, 2011); empirical evidence has shown that OL is essential for obtaining better financial business performance in SMEs (Sanzo et al., 2012). However, the role and contribution of OL in SMEs remain somewhat under-theorized (Sanzo et al., 2012) as the literature focuses largely upon large companies (Spicer and Sadler-Smith, 2006; Real et al., 2014). The few studies that have explored OL in the SME context have focused on measurement issues of OL and/or the links between OL, performance and growth (Spicer and Sadler-Smith, 2006; Hansen and Hamilton, 2011; Sanzo et al., 2012).

Given the evidence that OL is beneficial to SMEs, this paper aims to explore potential antecedents of this organizational construct by investigating the effect of EO on OL and the moderating role of business/university engagement on the EO-OL relationship. Drawing on knowledge-based theory (KBT) (Conner and Prahalad, 1996; Grant, 1996a,b) and the resource-based view of the firm (RBV) (Barney, 1991), the major contributions of this paper are: (1) the development of a broader model of OL in the SME context through the identification of potential direct and moderating antecedents of the OL construct, thus extending the limited studies that have, to date, focused on its outcomes, and adding to OL theory, and (2) the identification of EO as a strategic resource, embedded in tacit knowledge,

and business/university engagement as a complementary resource, embedded in explicit knowledge, both of which can strengthen OL. In summary, we suggest that SMEs can derive stronger OL and are more able to acquire knowledge, when the tacit knowledge in their EO is combined with explicit knowledge from their engagement with universities, thus adding to the RBV and KBT.

As highlighted by Morris et al. (2011), EO captures the extent to which a firm's posture may be characterized as entrepreneurial versus conservative, with entrepreneurial firms defined as those emphasizing innovativeness, proactiveness and risk-taking. As the combined level of these entrepreneurial dimensions rises within a firm, so does the firm's overall level of EO (Kreiser, 2011). It is widely acknowledged that EO contributes to firm success (Wang, 2008; Rauch et al., 2009). In addition, Kreiser (2011) calls for empirical research to test the direct impact of EO on OL; this study provides a response to this call. Given that EO levels vary considerably across SMEs (Covin and Lumpkin, 2011), we develop arguments that SMEs with higher levels of EO will seek and acquire knowledge whilst proactively looking for opportunities in the environment.

Furthermore, Kreiser (2011) noted the need to examine the factors influencing the relationship between entrepreneurial behaviors and OL; we contribute to the literature by exploring the moderating influence of business/university engagement in this relationship. Given the centrality of knowledge to both EO and OL, we particularly seek to examine the role of business/university engagement in connection to these constructs, in the context of SMEs. Universities are viewed as core knowledge-producing entities for businesses and a new type of university has been identified, the 'engaged' university, which evidences the knowledge transmitting role of universities (Boucher et al., 2003; Huggins et al., 2008). Governments have also sought to encourage universities to support SMEs in recent years (Charles, 2006). Society generally expects the universities it funds to work with SMEs to help

them flourish and be at the leading edge of markets which are now global in outreach (Powell, 2012). Knowledge transfer is an increasing activity within universities (Smith et al., 2010) and there is growing acceptance of the economic value of knowledge as a source of discontinuous innovation and competitive advantage (Gustavs and Clegg, 2005). However, in many countries owner-managers of small businesses have to be ‘incentivized’ to attend formal programs of learning, by means of direct or indirect subsidies (Gibb 2009: 209). This suggests that the value of knowledge obtained via business/university engagement is undervalued by many SMEs. Indeed, evidence indicates that far too many businesses are failing to reap the gains from university engagement (BIS, 2012) and universities are ranked relatively low in frequency of use as a direct source of knowledge by small firms (Cosh and Hughes, 2010). This paper examines whether the knowledge-based resources embedded in SMEs that engage with universities positively moderate their EO-OL relationship. Following a review of the literature, it was apparent that the moderating effect of business/university engagement in connection with EO-OL has been under-researched; the present study is novel as it may be the first to examine this moderating effect. Focused upon SMEs, this paper responds to recent studies highlighting the need for more OL research in the context of SMEs (Spicer and Sadler-Smith, 2006; Sanzo et al., 2012; Real et al., 2014).

This paper is structured as follows. In the next section, the theoretical background and hypotheses of this study are presented based on a review of the relevant literature. We then proceed to discuss the research methodology, followed by a presentation of the results from the research. Finally, a discussion of the findings concludes the paper, including academic, practical and policy implications, limitations and directions for future research.

## **Theoretical background and hypotheses development**

As SMEs are typically resource-constrained, due to their size and/or age, they can be aligned with the resource-based view of the firm (RBV) and knowledge-based theory (KBT) to examine the links between OL, EO and business/university engagement. The RBV (Barney, 1991, 2001) emphasizes the importance of intangible resources to a firm's sustained competitiveness (Lee et al., 2012) and relies on two central assertions, namely resource heterogeneity (i.e. resources and capabilities possessed by firms may differ) and resource immobility (which implies that resource differences may be long lasting) (Raymond and St-Pierre, 2013). Thus, a central proposition of the RBV is that a firm's rare, valuable and inimitable resources generate a competitive advantage and, thereby, an above normal rate of return (Javalgi and Martin, 2007). KBT focuses on knowledge as the most strategically important of the firm's resources (Grant 1996b) and has been viewed as an extension of the RBV. Conner and Prahalad (1996) argue that KBT is the essence of the RBV, as the RBV addresses performance differences between firms using asymmetries in knowledge. The authors explained that the central theme in the resource-based literature is that privately held knowledge is a basic source of advantage in competition. Hence, a resource-based theory of the firm entails a knowledge-based perspective (Conner and Prahalad, 1996). It is argued in the present study that the centrality of knowledge that underpins both the RBV and KBT is the basis of the relationship between OL, EO and business/university engagement in SMEs.

OL has been defined as "the development or acquisition of new knowledge or skills in response to internal or external stimuli that leads to a more or less permanent change in collective behavior and that enhances organizational efficiency and/or effectiveness" (Spicer and Sadler-Smith, 2006: 135). This suggests that the origin of OL can be internal or external, consistent with KBT. As noted by Santoro and Bierly (2006), KBT distinguishes between the internal creation of knowledge and knowledge acquisition. Knowledge acquisition is defined

as the search, identification and absorption of external knowledge (Santoro and Bierly, 2006). Prior studies (Dess et al., 2003; Kreiser, 2011; and Zhao et al., 2011) distinguish between two major types of OL, experimental learning and acquisitive learning. “*Experimental learning* occurs inside the firm and generates knowledge that is distinctive to it [while] *acquisitive learning* takes place when the firm gains access to and subsequently internalizes pre-existing knowledge from its external environment” (Dess et al., 2003: 356). OL, in the present study, focuses on the latter type, acquisitive learning. Usually this occurs when knowledge-based resources (Kreiser, 2011) are acquired from external sources, such as collaborative partners, which in turn increases the firm’s stock of knowledge and creates value (Zhao et al., 2011). SMEs typically rely on external sources for new knowledge generation in order to compensate for the scarce resources that hinder their organizational development (Hitt and Sirmon, 2003; Jones and Macpherson, 2006). Mavondo et al. (2005) highlight that learning might be ‘the next source of competitive advantage’ or ‘the only source of competitive advantage’, and that OL is a key to the future success of the firm. Rhee et al. (2010) further stressed that if a small firm is less learning-oriented than its competitors, it may struggle to survive.

Alternatively, the EO construct could be construed as “a usually general or lasting direction of thought, inclination, or interest pertaining to entrepreneurship” (Covin and Lumpkin, 2011: 857). Its origin is widely linked to Miller’s (1983) study which suggests that EO seeks to explore the extent to which firms are involved in entrepreneurial behaviors such as engaging in product market innovation, undertaking risky ventures and developing ‘proactive’ innovations. Although the original EO components were innovativeness, proactiveness and risk-taking, these have now been extended to include autonomy and competitive aggressiveness (Miller, 2011). However, most scholars agree that innovativeness, proactiveness and risk-taking are the key dimensions (Wiklund and Shepherd, 2005). The

dimensions are defined as follows: innovativeness is a tendency to search for novel, unusual, or creative solutions to challenges (Morris et al., 2002); risk-taking is entering into a costly commitment that has an uncertain future outcome (Pearce et al., 2010); and proactiveness is a forward-looking perspective where companies actively try to anticipate future market opportunities ahead of competition (Lumpkin and Dess, 1996). Given that EO is characterized by a firm's ability to proactively seek opportunity (Javalgi and Martin, 2007), firms with EO will develop higher levels of knowledge-based resources enabling a competitive advantage under both the RBV and KBT arguments. Hence, EO has been conceptualized as a key strategic resource in prior studies (e.g. Javalgi and Martin, 2007; Runyan et al., 2008). Furthermore, the RBV has focused on internal resources which are generally classified into four categories: financial, physical, human capital and organizational (Powers, 2003; Powers and McDougall, 2005). Aligned with these, EO can be viewed as an internal organizational resource.

### *Relationship between EO and OL in SMEs*

Firms that have an EO are more prone to focus attention and effort towards maximizing and identifying new opportunities (Wiklund and Shepherd, 2003). These firms require knowledge to discover and exploit new opportunities (Wiklund and Shepherd, 2003). Also, at the centre of entrepreneurship, an embeddedness of processes exists that clearly requires novel orientations (Fletcher and Watson, 2007) for which knowledge development is crucial. Hence, KBT suggests that the development and deployment of knowledge, which can provide a sustainable competitive advantage (Siguaw et al., 2006), can arise as a result of a firm's EO. Both RBV and KBT suggest that those SMEs with higher levels of EO will be accumulating knowledge-based resources as their EO level increases. However, as a result of resource constraints and associated liabilities most SMEs have a limited knowledge resource base.

As noted by Rhee et al. (2010), firms that are entrepreneurial scan their external environment proactively and the process of exploring the environment requires a capability to learn. Additionally, Kreiser (2011) argues that firms with higher levels of EO will have expanded opportunities to exchange knowledge-based resources, enhance the value creation associated with these exchanges, and encourage firms to participate in more exchanges. Consequently, as EO increases it is likely that concerns with, and commitment to, learning will increase rapidly in order to collect relevant information about opportunities (Rhee et al., 2010).

Wang (2008: 640) argues that “EO creates a fertile internal environment for organizational learning to take place. The more entrepreneurial a firm, the more learning-oriented it is, the more likely it instils values that promote commitment to learning, open-mindedness, and shared vision”. Wang (2008) found that learning orientation mediates the EO-performance relationship in medium-to-large firms; learning orientation was conceptualized as the internal firm values (i.e., commitment to learning, open-mindedness, and shared vision) that influence employees’ propensity to create and use knowledge. Unlike Wang (2008), our paper focuses on examining the direct effect of EO on OL (i.e., knowledge acquisition from external sources) in SMEs. A recent study by Real et al. (2014) also found that OL partially mediates the EO-performance relationship. The results from a study by Chaston et al. (2001) suggest that firms which have adopted an EO, based upon a market position of offering innovative goods and services, can be expected to exhibit a higher level of organizational learning than firms which are orientated towards the more conservative positioning of serving the needs of customers seeking standard goods and services. The foregoing studies all suggest that firms with a high level of EO will actively seek new knowledge. With EO, the firm is better placed to acquire and incorporate knowledge. This notion is reinforced by Ashforth et al.’s (2007) argument that proactive behavior facilitates

learning. Also, Dess et al. (2003), in a conceptual paper, argue that firms develop knowledge through effective corporate entrepreneurship (i.e. various forms of newness such as innovation). Hence, our first hypothesis is proposed:

*H1:* The level of entrepreneurial orientation (EO) in SMEs is positively related to the level of organizational learning (OL).

### *Moderating influence of business/university engagement*

Most SMEs, due to limited resources, need to access bundles of resources, including knowledge-based resources. From the resource perspective, small firms can use their network resources, such as those with universities, to acquire knowledge (Wiklund et al., 2009) and to build additional knowledge-based networks with other small firms and large organizations. Prior studies have suggested that the role of relationship-based factors is of particular relevance for SMEs (Sanzo et al., 2012). Additionally, it has been argued that “universities are the source of strength in the knowledge-based economy of the twenty-first century” (Wilson, 2012: 2) and governments across the globe are increasingly encouraging universities to engage with SMEs in order to support the growth and development of these crucial firms.

Prior studies have found that research partnerships between firms and universities are one of the means of engagement that have the highest impact, enabling firms to access a range of resources (Huggins et al., 2008). The services offered by universities to smaller firms include business assistance, extension services, and accelerator and outreach programmes designed to transfer university expertise in new technologies and business practices to improve product performance, product quality and process efficiency (Huggins et al., 2008). Through engagement with universities, businesses can gain access to the latest research in their fields and innovative employees in the form of graduates or students on

work placements (BIS, 2012). SMEs are also able to gain access to innovative ideas and opportunities via the networks developed from their university engagement.

University-to-industry has become the dominant direction of knowledge flows; a commonly held view is that academics provide firms with knowledge through university-industry collaborations which lead to interactive learning (Baba et al., 2009). Philbin (2012) developed arguments that university engagement will precede learning, noting that business/university engagement is a form of alliance that provides platforms for learning. Firms collaborate with universities to gain access to specific knowledge outputs which can then be developed further to enhance industrial competitiveness (Philbin, 2012).

High levels of knowledge-based resources will be embedded in SMEs by engaging with universities. Therefore, both RBV and KBT suggest that SMEs with higher levels of EO, that engage with universities, will have an advantage over competitors, in relation to their level of OL. Firms that are aware of the benefits that can be derived from business/university engagement are able to integrate academic capabilities with product development opportunities (Philbin, 2012). Indeed, it has been argued that firms attempt to create appropriate value in inter-firm relationships by leveraging the superior resources they possess with complementary resources (Anatan, 2013). Given that EO is a strategic resource it can be viewed as a superior organizational resource, and business/university engagement is a complementary resource that will enhance OL levels. Hence, the second hypothesis:

*H2: The relationship between EO and OL is positively moderated by SMEs' university engagement such that greater university engagement leads to stronger positive EO effects on OL.*

## **Research methods**

### *Sample and collection of data*

A postal survey was utilized to gather data from SMEs in the North West of England in order to test the hypotheses developed for this study. The North West region of England provides a suitable context for this study because of the need and interest to foster business support programmes that can lead to business growth in SMEs in this region. Decter et al. (2011) described the economic situation in the North West region of England, explaining that it has been underperforming and, compared to the England average, output per head is lower in the North West. A recent publication by the Office for National Statistics (ONS, 2012) also indicates that productivity levels in the North West are among the lowest in England. As a result of the level of economic deprivation in this region, various economic development activities have been introduced over the years. In particular, given that a flourishing small business sector is central to the vision of economic growth in the UK (Smith et al., 2010), institutions such as the former North West Regional Development Agency (NWDA) and the European Union via the European Regional Development Fund (ERDF) have provided funding to universities for business support programmes targeted at SMEs in the region. The North West region provides an interesting context to understand issues relating to OL, EO and the role of business/university engagement in SMEs.

Thus far, there is no generally accepted definition of an SME (Lu and Beamish, 2001). The UK Department for Business, Innovation and Skills (BIS), a government department responsible for enterprise and business support, defines SMEs as having between 0-249 employees (BPE, 2010). This definition was adopted for the purpose of this study, and it corresponds with the EU definition ([www.ec.europa.eu](http://www.ec.europa.eu)). SMEs are viewed as important forces within the economy; for example, over 99% of all European businesses are SMEs, providing over 60% of the private sector jobs and contributing to more than 50% of the total

value-added created by businesses ([www.ec.europa.eu](http://www.ec.europa.eu)). Thus, SMEs play a major role in wealth creation and economic growth within Europe ([www.ec.europa.eu](http://www.ec.europa.eu)). Likewise, although SMEs are defined in the US as companies that have less than 500 employees, they comprise approximately 99% of all US employer and non-employer firms ([www.sbecouncil.org](http://www.sbecouncil.org)).

The population of SMEs in this study was defined using the following three criteria: (1) All active companies (not in receivership nor dormant); (2) with a registered office address or primary trading address in the North West; and (3) with less than 250 employees in the last trading year. These three criteria were used for the selection of firms from the FAME database, which provides comprehensive information on over 8 million companies in the UK and Ireland ([www.bvdinfo.com](http://www.bvdinfo.com)). The FAME database is provided by BvD, a publisher of company information and business intelligence ([www.bvdinfo.com](http://www.bvdinfo.com)). This database can be used to research individual companies, to search for companies with specific profiles, and to undertake analysis ([www.bvdinfo.com](http://www.bvdinfo.com)). The information contained in the FAME database includes data regarding directors and contacts, original filings at Companies House, corporate structures, shareholders and subsidiaries, industry research and other data ([www.bvdinfo.com](http://www.bvdinfo.com)). The FAME database enabled the identification of firms that matched the selection criteria of this study including size and location. The database also provided other relevant details such as key contacts for personalizing the covering letters. Based on the three criteria, 4,191 firms were identified, of which 3,133 firms had a full address including a postcode. For firms with incomplete addresses, a web search was conducted to identify their full addresses which proved unsuccessful. Therefore, 3,133 SMEs were sent a copy of the questionnaire, the entire population available in FAME. It is noteworthy that there is no single database in existence in the UK which contains details on every active business (SME Statistics, 2010). Westhead et al. (2004: 507) stress that “there is no comprehensive list of

independent, unquoted companies in the UK". As a result, it was not possible to ascertain the representativeness of the sample.

The questionnaire was designed using measurement items grounded in the literature. It was pretested by sending copies to the Managing Directors of 100 SMEs in the North West. The final version of the questionnaire was then mailed to all the SMEs selected above. The questionnaire pack included a postage-paid reply envelope and a covering letter sent to a named individual. The questionnaire contained a section enquiring about the respondent's main role in the business. The information given in this section corroborated the fact that it was our target respondents that completed the questionnaires. The majority were Managing Directors, while others included top executives – the Chairman, Executive Director, Partner and Owner-Manager.

Two rounds of reminders containing a follow-up letter and a replacement questionnaire pack were sent to all non-respondents. In all, one hundred and thirty four questionnaires were returned undelivered due to reasons such as addressee not found, gone away, or has closed down. It was estimated that at least 2,747 SMEs must have received a copy of the questionnaire. One hundred and fifty completed questionnaires were received from the original mailing, one hundred and two from the first round of reminders, fifty three from the second round of reminders, and four that could have been from any of the mailing rounds (as they could not be allocated to a particular mailing round due to the respondents retaining the envelope that contained the identification tracking code). Thus, the number of completed questionnaires received totalled 309, an overall response rate of 11.25 percent. Given the need to have respondents comprising of top executives (Lee et al., 2001), the response rate is acceptable and in keeping with the usual 10-12 percent response rate commonly reported for postal surveys to top executives in small, medium and large sized organizations (Hambrick et al., 1993; Simsek et al., 2007, 2010). After excluding PLC

(listed) firms, subsidiaries of another company and firms that are part of a large group of companies, 206 usable responses remained and were subsequently used for all the analyses in the present study. A comparison of early respondents and late respondents on the key constructs, using T-test, showed no statistically significant differences (Armstrong and Overton, 1977). Therefore, there was no evidence of non-response bias.

The average age of respondents' firms was approximately 42 years (the standard deviation was approximately 46) and the average size was approximately 112 employees (the standard deviation was approximately 200). The sample included both well established and young SMEs, with various firm sizes, thereby enhancing generalization (Miller and Friesen, 1982). Respondents were from different industry sectors, namely (1) manufacturing; (2) agriculture, forestry, fishing; (3) construction; (4) business services; (5) consumer services; (6) retailer; (7) transport and communication; (8) wholesale distribution; (9) 3<sup>rd</sup> sector – voluntary/community; and (10) other.

### *Measurement of constructs*

We used Principal Components Analysis to assess the factor structure of the variables' measurement scales where relevant (Weaven et al., 2009). The scales all had acceptable factor structures, with all items having factor loadings that were 0.40 or above, the widely recognized benchmark (Kaya, 2006), and the eigenvalues for all factors were greater than 1.

*Dependent variable.* Drawing on prior studies (Ucbasaran, 2004; Wiklund et al., 2009; Zhao et al., 2011), a five-item scale was developed to measure the dependent variable, OL. Respondents were asked to indicate the extent to which they agree with the following statements, using a 5-point Likert scale (1: *strongly disagree* to 5: *strongly agree*): (1) We learn a lot from other organizations we work with; (2) We pass a lot of knowledge onto organizations we work with; (3) Other SMEs are an important source of knowledge; (4) Our

network of contacts is crucial for gaining knowledge; (5) We use alliances with larger firms to acquire knowledge. The scale exhibited high reliability with a Cronbach's alpha value of 0.79.

*Independent variable.* Drawing on prior studies (Miller and Friesen, 1982; Covin and Slevin, 1989; Langerak, 2003; Ucbasaran, 2004; Menguc and Auh, 2006; Keh et al., 2007), we employed a five-item scale to measure EO. Respondents indicated the extent to which they agreed with the following items in relation to their business on a 5-point Likert scale (1: *Strongly disagree* to 5: *Strongly agree*): (1) Management actively seek innovative ideas; (2) Changes in our product lines have usually been dramatic; (3) We invest heavily in Research and Development (R&D); (4) We are at the forefront of developments in our industry; (5) Bold wide ranging acts are necessary to achieve the firm's objectives. These items measure the three core dimensions of EO: innovativeness, risk-taking and proactiveness. Wiklund and Shepherd (2005: 75 italics added) also stress that "it appears logical that the three dimensions should be closely related. For instance, a new company that comes up with a radically new product based on a technological *innovation* typically takes a *risk*, as the demand for the new product is unknown. Given that other firms do not introduce the same new product at the same time, it is also *proactive* in relation to competitors". This suggests that the innovativeness dimension of EO, for example, also involves elements of proactiveness and risk-taking. The items were merged into a single scale (EO) which has acceptable reliability, with a Cronbach's alpha ( $\alpha$ ) value of 0.65. This  $\alpha$  value is consistent with that reported in prior studies for EO (e.g.  $\alpha = 0.64$  in Wiklund and Shepherd, 2005;  $\alpha = 0.65$  in De Clercq et al., 2005).

*Moderating variable.* To measure the moderating variable, business/university engagement, we employed a broad measure that enabled us to account for the large number of highly diverse domains of activity comprising business/university engagement, for which

it is impossible for any university to operate in all domains (Boucher et al., 2003; Huggins et al., 2008; Wilson, 2012). Business/university engagement was measured as a dichotomous dummy variable, indicating whether the company has ever had any engagement with any university (=1) or not (=0). If yes (=1), respondents were asked to briefly explain the nature of the engagement. The responses indicated that businesses engaging with universities were involved in diverse activities such as partnerships; Knowledge Transfer Partnerships (KTP) and its predecessor, the Teaching Company Scheme (TCS); business support programmes, with references being made to the LEAD programme designed by Lancaster University Management School, student consultancy projects, and other technical and business projects. Our dichotomous measure of business/university engagement is consistent with previous studies (e.g. García-Aracil and Fernández De Lucio, 2008; Laursen et al., 2011). The confidence interval for the correlations between the constructs OL and business/university engagement do not include 1, empirically indicating the discriminant validity of the constructs (Anderson and Gerbing, 1988; De Clercq et al., 2010).

*Control variables.* The small business community is very heterogeneous and behavior is influenced by a variety of factors (Lepoutre and Heene, 2006). To account for the heterogeneity of small firms and their operating environment (Lepoutre and Heene, 2006; Ruzzier et al., 2006), we controlled for various factors that are likely to influence the level of OL in SMEs, which can lead to alternative explanations (Li et al., 2008b).

First, firms of different size and age, and those operating in different industries, may exhibit different organizational and environmental characteristics (Wiklund and Shepherd, 2005) that may influence OL. Therefore, *firm size*, *firm age* and *industry sectors* were controlled. Firm size was measured by the firm's total number of employees, firm age was measured by the number of years the business had been founded, and industry sectors were measured with 10 dichotomous dummy variables along the following categories, indicating

where respondents classified their primary product line or service (i) Manufacturing; (ii) Agriculture, forestry, fishing; (iii) Construction; (iv) Business services; (v) Consumer services; (vi) Retailer; (vii) Transport and communication; (viii) Wholesale distribution; (ix) 3<sup>rd</sup> sector- voluntary/community; and (x) Other.

Second, as the level at which SMEs are performing financially and socially can potentially impact the firm's motivation for learning, firm performance was controlled in relation to two dimensions, *sales growth* and *social performance*. It is expected that SMEs doing well financially will seek to enhance their OL in order to maintain their performance. Hence, to capture financial performance, sales growth was measured as a dichotomous dummy variable, indicating whether sales have grown (=1) or declined (=0) over the last three years. In relation to social performance, small businesses are embedded in their local community (Worthington et al., 2006). Many draw their client base and employees from the local community; hence, a good reputation in the local community can enhance competitiveness in small businesses (Lepoutre and Heene, 2006). Many small firms recognize that community involvement can aid enhancement of their reputation and stakeholder relationships (Worthington et al., 2006). Therefore, SMEs with a high level of social performance may be inclined to engage in intense learning as a way of maintaining their social status. Social performance was measured using a weighted average performance score, following the procedures of Westhead et al. (2004) and Westhead and Howorth (2006). The weighted average score was calculated for each firm based on the "importance" respondents attached to two performance objectives over the last three years (i.e., giving something back to the community, and minimizing impact on the environment; each rated on a scale ranging from 1 *Not at all important* to 5 *Very important*), and the level of "satisfaction" their business had achieved with regard to each of these objectives over the last three years (i.e., each reported on a scale ranging from 1 *Very dissatisfied* to 5 *Very satisfied*).

These objectives were developed from prior studies (Kourilsky and Walstad, 1998; Lepoutre and Heene, 2006; Worthington et al., 2006). A weighted score for each performance objective was calculated by multiplying the “importance” score with the “satisfaction” score. The two scores were then added together and the total score was divided by two. The scale exhibited high reliability with a Cronbach’s alpha of 0.72.

Third, we controlled for *family ownership* given that many SMEs are family businesses and these family enterprises are largely influenced by family objectives, values and relationships (Sanzo et al., 2012; Howorth and Hamilton, 2012). It was, therefore, expected that family owned SMEs have less inclination towards acquisitive learning from external sources. A dichotomous variable measured whether or not the respondent’s business was family owned.

Fourth, the *age of the Managing Director/Top Executive* was also controlled as those who are younger may have more drive for learning compared to their older counterparts. Respondents were asked to indicate their age.

### *Common method bias*

We employed procedural and statistical techniques (Podsakoff and Organ, 1986; Podsakoff et al., 2003) in order to address issues associated with common method bias. First, respondents were assured anonymity and confidentiality in order to reduce their evaluation apprehension (Podsakoff et al., 2003). Second, we utilized the Harman one-factor test, which involved including all the items from the constructs in our study in a factor analysis (Podsakoff and Organ, 1986; Podsakoff et al., 2003). The results produced several factors which represent 57.25% of the total variance, with the first factor representing 24.80% of the variance. Hence, no sole factor was evident from the factor analysis and no single factor represented a greater proportion of the variance (Rhee et al., 2010). These indicate that common method bias is

unlikely to be a problem in our data, and the results also offer support for the validity of the measures employed in this research (Stam and Elfring, 2008; Rhee et al., 2010).

## **Analysis and results**

Table 1 presents the means, standard deviations, and correlations of the constructs. Multicollinearity diagnostics were applied to ensure that multicollinearity did not pose a problem in the data. The variables required for the interaction term were mean centred, prior to generating the interaction term. The highest value of the variance inflation factor (VIF) was 1.20. Normally, correlations that exceed 0.70 and VIFs that are greater than 10 are indicative of severe multicollinearity problems (Walter et al., 2006). These were not the case in our data, thus the statistics strengthen confidence in the regression results detailed below (Hughes and Morgan, 2007).

We estimated four different models. In Model 1, multiple regression analysis was used to assess the effect of the control variables on OL, while the independent variable, EO, was added in Model 2. Models 3 and 4 were used to estimate the interaction effects using moderated multiple regression (MMR), following Aguinis and Gottfredson's (2010) procedure for situations when the moderator is a binary variable with two levels *1* and *0*. As described by Aguinis and Gottfredson (2010), this involves creating two ordinary least squares (OLS) regression equations (1) and (2) below, where *y* is the dependent variable OL, *x* is the independent variable EO, *z* is the moderator business/university engagement, *e* is the residual term, *a* is the constant; *b*<sub>1</sub>, *b*<sub>2</sub>, *b*<sub>3</sub> are the coefficients:

$$y = a + b_1x + b_2z + e \tag{1}$$

Equation (1) shows the OLS regression equation for the model predicting *y* from the first-order effects of *x* and *z*.

$$y = a + b_1x + b_2z + b_3x \cdot z + e \tag{2}$$

Equation (2), called the MMR model, includes the first-order effects as well as a product term comprising the independent variable and the moderator.

As Aguinis and Gottfredson (2010) explain, to test for the presence of a hypothesized moderating effect (i.e. the interaction effect between  $x$  and  $z$  in predicting  $y$ ), the  $R^2$  from Equation (1) (i.e.  $R_1^2$  in Model 3) and the  $R^2$  from Equation (2) (i.e.  $R_2^2$  in Model 4) are compared to determine whether the addition of the moderating effect in Equation (2), i.e. the product term, improves the prediction of  $y$ , i.e. the proportion of explained variance in  $y$ , above and beyond the first-order effects of variables  $X$  and  $Z$  alone.

The results are displayed in Table 2. The results corresponding to Model 1 indicate that this model was statistically significant ( $F$  statistic=1.853  $p=0.029$ ). Model 2 was statistically significant ( $F$  statistic=2.248,  $p=0.018$ ) and explained 19.2% of the variance in OL. EO was positively and significantly related to OL ( $\beta=0.208$ ,  $p=0.007$ ) in model 2. Thus, H1 was supported. In interpreting Models 3 and 4 to test for the presence of a potential moderating effect on the EO-OL relationship, the inclusion of the product term resulted in a change in  $R^2$  which was significant ( $\Delta R^2 = 0.023$ ;  $p=0.000$ ). Therefore, the addition of the moderating effect in Model 4 improves the prediction of  $y$  (i.e. the proportion of explained variance in  $y$ ) above and beyond the first-order effects of variables  $X$  and  $Z$  alone in Model 3. The significance of the  $R^2$  change value therefore confirms the moderating effect. Hence, H2 was supported.

Insert Table 1 about here.

Insert Table 2 about here.

The moderating effect of business/university engagement is plotted in Figure 1. The Figure shows that EO has a more positive relationship with OL among SMEs with high

business/university engagement. When business/university engagement is high, the increase in EO affects more OL (Li et al., 2008a). In contrast, when business/university engagement is low, EO has a relatively flat positive relationship with OL (Li et al., 2008a).

**Insert Figure 1 about here.**

## **Discussion**

Although the importance of learning is widely acknowledged in the literature, the exact mechanisms that stimulate OL remain poorly understood, as noted by Kreiser (2011). Our study contributes to this body of literature by providing empirical evidence on the direct relationship between EO and OL in the context of SMEs and the moderating influence of business/university engagement on the strength of the EO-OL relationship. Kreiser (2011) developed theoretical propositions regarding the role of EO in enhancing OL and urged future scholars to empirically test the argument presented in his paper. In particular, Kreiser (2011: 1033) theoretically argued that “the higher the firm’s EO, the more willing and able it is to acquire existing knowledge-based resources from its external environment”. Sanzo et al. (2012) identify that OL is of particular interest in the context of SMEs, where it has been under-theorized. Our study provides empirical evidence confirming Kreiser’s theoretical proposition in the context of SMEs, and offers further contributions by demonstrating the impact of the interaction effect of EO and business/university engagement on OL. Despite the growing interest in knowledge transfer between higher education institutions (HEIs) and businesses by policy makers at all levels of government (Lockett et al., 2008), there is no known study investigating the effect of business/university engagement on the EO-OL relationship in SMEs. This study addresses this research gap. The findings from this paper suggest that EO has a more positive relationship with OL among SMEs with high

business/university engagement. This is because this group of firms can benefit from the knowledge-based resources embedded in universities, such as the provision of high-level skills, a world-class research base and a culture of inquiry and innovation (Wilson, 2012), which strengthens the effects of EO on OL. Our study contributes to OL theory by developing a broader model of OL in the SME context. Unlike the limited studies that focus on the outcomes of OL in SMEs, we identify two important precursors: (i) EO as a direct antecedent; and (ii) business/university engagement as a moderating antecedent, thereby adding to OL theory.

By demonstrating that learning in the context of SMEs is an outcome of EO, our study provides further contributions to the EO literature. While a substantial body of literature now exists on the impact of EO on firm performance, fewer studies explore issues associated with learning as a dependent variable (See Wales et al.'s (2013) recent review). Our findings support Kreiser's (2011) argument that a possible explanation for the positive effect of EO on firm performance may be attributed to the increased levels of knowledge acquisition fostered through EO.

Competitive advantage now relies heavily on how effectively firms manage knowledge (Lee and Sukoco, 2007). We have identified the centrality of knowledge that underpins the RBV and KBT as the basis of the relationship between OL, EO and business/university engagement in SMEs. As Santoro and Bierly (2006) explain, KBT identifies two different types of knowledge, tacit and explicit knowledge, terminologies believed to have originated from Polanyi. Knowledge is *explicit* if it is transferable from one individual to another via some form of formal communication system, i.e. explicit knowledge must be articulable or codifiable (Santoro and Bierly, 2006). In contrast, knowledge is *tacit* if it cannot be formally communicated (Santoro and Bierly, 2006). Tacit knowledge resides in the firm's system and is difficult to transfer from one firm to another (Cavusgil et al., 2003).

Here, we add to the RBV and KBT by delineating EO as a strategic resource (embedded in tacit knowledge) that directly influences OL and business/university engagement as a complementary resource (embedded in explicit knowledge) that strengthens the EO-OL relationship in SMEs.

EO is embedded in more tacit knowledge because it is widely associated with superior performance and indicates a commitment to innovativeness, risk-taking and proactiveness. Tacit knowledge is important for sustainable competitive advantage and is deeply rooted in values, action and commitment (Baba et al., 2009; Niedergassel and Leker, 2011). Indeed, it has been argued that tacit knowledge is a key resource for continuous innovation (Numprasertchai and Igel, 2005). A highly innovative firm will make it difficult for competitors to imitate its know-how because of its unique and rare tacit knowledge that forms a key component of its innovations, thereby explaining its superior performance (Cavusgil et al., 2003). However, knowledge is transferred through some form of systematic language and formal communication (Santoro and Bierly, 2006; Baba et al., 2009) when businesses engage with universities, thus implying that business/university engagement is embedded in more explicit knowledge. This is consistent with arguments presented by Azagra-Caro (2007) and Wright et al. (2008) that most of the knowledge at a university can be described as explicit knowledge. We contribute to theory by providing empirical evidence that demonstrates that SMEs can derive stronger OL or knowledge acquisition when the tacit knowledge in their EO is combined with explicit knowledge from external engagement with universities. Numprasertchai and Igel (2005) noted that a firm can increase innovation by turning tacit knowledge into explicit knowledge through externalizing. Li et al. (2009) explain that through externalization, firms can understand new product development and articulate tacit knowledge for new product innovation. Hence, given that it is possible, through collaborations with universities, to articulate tacit knowledge into explicit forms (Li et al.,

2009) this can offer explanations for why SMEs that engage with universities have stronger EO-OL benefits.

The findings from this study have implications for practitioners. OL, as studied in this paper, focuses on acquisitive learning, which is generated from the acquisition and assimilation of existing knowledge that exists outside the firm and usually promotes incremental change (Kreiser, 2011). Conceptually, it is similar to exploitative learning, adaptive learning and potential absorptive capacity (Kreiser, 2011). The findings reported in the present study demonstrate that SMEs, due to their resource-constraints and associated liabilities of age and/or size, are able to foster higher levels of acquisitive knowledge by developing a high degree of EO and developing links with universities. The current study contributes to the literature by providing empirical research which demonstrates that knowledge transferred from universities enhances OL in SMEs even though recent findings (e.g. Cosh and Hughes, 2010) suggest that small firms do not value this knowledge. Additionally, given the evidence that OL is important to the success and performance of SMEs (Spicer and Sadler-Smith, 2006; Sanzo et al., 2012), our findings suggest that practitioners can derive value from sustaining high levels of EO and having connections with universities.

Furthermore, our results, in relation to business/university engagement as a significant moderator in the EO-OL relationship, suggest that universities need to do more to promote their commercial value and their ability to assist SMEs to attain a competitive advantage. More particularly, SMEs with higher levels of EO should be encouraged to engage with universities because they should have a better state of readiness to work with HEIs. Based on the RBV and KBT arguments, these SMEs will develop higher levels of knowledge-based resources by engaging with universities, enabling a competitive advantage. Given that both EO and OL have been linked with firm growth, our findings on the positive moderating effect

of business/university engagement on the EO-OL relationship support the need for stronger intervention on SME/university engagement, as suggested in a review by Wilson (2012). While many businesses do engage with universities, far too many businesses still do not benefit from the rewards of university engagement (BIS, 2012). Cosh and Hughes' (2010) comparative international survey of businesses in the UK and US found that in both countries universities are ranked relatively low in frequency of use as a direct source of knowledge. As the authors explain, although these results do not mean that universities are not important to businesses, they simply mean that the frequency of their use is relatively small (Cosh and Hughes, 2010). More specifically, Cosh and Hughes' (2010: 81) study reveals that "a particularly low relative value is placed upon universities by small firms in the UK, [suggesting] that there may be a particular problem in relation to the pattern of interaction between smaller businesses and the university base in the UK". A study by Hughes et al. (2011: 40) also stresses that, generally, "practitioners do not make the most of management academics as a source of knowledge". The positive moderating effect of business/university engagement on the EO-OL link reported in the present study supports the foregoing prior studies suggesting the need for more ways of linking universities with SMEs.

The findings from this study suggest that, within the UK, increasing initiatives that encourage engagement between universities and SMEs may lead to improved OL. The Research Excellence Framework (REF), which is the new system for evaluating the quality of research in UK HEIs, may be a useful tool for sustaining increased engagement between universities and businesses ([www.ref.ac.uk](http://www.ref.ac.uk)). The REF aims to reward research departments in universities that have an impact on the economy, society and/or culture, underpinned by excellent research, including engagement with businesses ([www.ref.ac.uk](http://www.ref.ac.uk)). The results from the present study suggest that an impact of university engagement with businesses is the positive moderating effect it has on the EO-OL relationship. By adding this contribution to

the literature, our findings may encourage more universities to develop impact case studies concerned with the moderating role of business/university engagement on the relationship between firms' EO and OL.

Furthermore, our findings have implications for businesses across Europe as universities are increasingly being encouraged to strengthen their links with industry. The EU Structural Funds, 2014-2020, offer a broad spectrum of opportunities to bring universities and SMEs across Europe to engage more closely together. A summary of discussions at a recent EU Structural Funds Seminar, held by the Association for University Research and Industry Links (AURIL) in 2013, shows that universities are able to utilize EU funds, for example the European Regional Development Fund (ERDF) and the European Social Fund (ESF), to support innovation and knowledge exchange in their regions ([www.auril.org.uk](http://www.auril.org.uk)). Another opportunity is Horizon 2020, the largest EU Research and Innovation programme to date, with approximately €80 billion of funding available over a period of seven years (2014-2020) ([www.ec.europa.eu](http://www.ec.europa.eu)). SMEs are positioned to significantly benefit from Horizon 2020, as at least €7 billion is being allocated for research and innovation work ([www.2020visionnetwork.eu/sme/](http://www.2020visionnetwork.eu/sme/)). The EU is working towards unlocking the huge amount of valuable research and Intellectual Property that is held by universities and research centres across Europe, via fast-track to market schemes designed specifically to support SMEs to innovate ([www.2020visionnetwork.eu/sme/](http://www.2020visionnetwork.eu/sme/)). The findings from our study confirm that SMEs with high levels of EO should be encouraged to exploit such opportunities to the maximum. Implications for policy makers might include fostering initiatives to encourage EO within SMEs. EO within this study includes three dimensions: innovativeness, proactiveness and risk-taking. The EU funding, described above, will provide opportunities specifically around encouraging innovativeness and proactiveness, but additional policy measures to encourage risk-taking are far more controversial. Many SMEs

state access to financial capital as a huge problem in terms of executing risk-taking initiatives. Our findings suggest that policies to promote all dimensions of EO should be encouraged in SMEs.

#### *Limitations of the study and future research directions*

As with all studies (Wiklund and Shepherd, 2005), the present study is not free from limitations which also provide future research directions. First, since this study was based on a cross-sectional research design, it limits the extent to which we can ascertain whether the degree of OL in SMEs is sustained in the long-term as a result of the roles of EO and business/university engagement. However, the cross-sectional research approach used in this study is consistent with that of prior studies on OL (e.g. Sanzo et al., 2012). Nevertheless, future studies can consider examining the long-term effect of the hypotheses developed in this study via a longitudinal analysis. Second, while this study conceptualized and assessed EO as a unidimensional construct, it is possible that the individual dimensions of EO (innovativeness, risk-taking and proactiveness) may drive OL in different directions. However, our approach in conceptualizing EO as a unidimensional construct is in keeping with the majority of previous EO research (e.g. Keh et al., 2007; Wiklund et al., 2009; Messersmith and Wales, 2011). As highlighted in Covin and Lumpkin (2011: 866), Miller (1983), credited with introducing the EO construct, describes EO as a “composite dimension”, and Covin and Slevin (1989) subsequently describe EO as a “unidimensional concept”. Nevertheless, future studies may consider looking at the relationship between the distinct individual dimensions of EO and the OL construct in SMEs.

## Conclusion

Through an empirical study of OL in SMEs, this paper extends this under-theorized research area (Sanzo et al. 2012) to develop a broader model that identifies potential direct and moderating antecedents of the OL construct; these comprised EO and business/university engagement respectively. It was shown that EO and business/university engagement can be embedded concurrently to maximize OL (knowledge acquisition) benefits in SMEs. Following a review of the literature, it was apparent that the moderating effect of business/university engagement in connection with EO-OL has been under-researched; the present study may be the first to examine this moderating effect. Based on the novelty of this empirical evidence, we have identified the centrality of knowledge, which is the foundation of the RBV and KBT, as the basis of the relationship between OL, EO and business/university engagement in SMEs. This study adds to the RBV and KBT by delineating EO as a strategic resource (embedded in tacit knowledge) that directly influences OL and business/university engagement as a complementary resource (embedded in explicit knowledge) that strengthens the EO-OL relationship in SMEs. Future studies can explore further the positive moderating effect of different forms of business/university engagement on the EO-OL link, within heterogenous SMEs.

## References

- Aguinis H and Gottfredson RK (2010) Best-practice recommendations for estimating interaction effects using moderated multiple regression. *Journal of Organizational Behavior* 31: 776–786.
- Anatan L (2013) A proposed framework of university to industry knowledge transfer. *Review of Integrative Business and Economics Research* 2(2): 304–325.
- Anderson JC and Gerbing DW (1988) Structural equation modeling in practice: A review and recommended two step approach. *Psychological bulletin* 103(3): 411–423.
- Ashforth BE, Sluss DM and Saks AM (2007) Socialization tactics, proactive behavior, and

- newcomer learning: Integrating socialization models. *Journal of Vocational Behavior* 70: 447–462.
- Armstrong JS and Overton TS (1977) Estimating non-response bias in mail survey. *Journal of Marketing Research* 14: 396–402.
- Azagra-Caro JM (2007) What type of faculty member interacts with what type of firm? Some reasons for the delocalisation of university–industry interaction. *Technovation* 27(11): 704–715.
- Baba Y, Shichijo N and Sedita SR (2009) How do collaborations with universities affect firms’ innovative performance? The role of “Pasteur scientists” in the advanced materials field. *Research Policy* 38(5): 756–764.
- Barney JB (1991) Firms resources and sustained competitive advantage. *Journal of Management* 17 (1): 99–120.
- Barney J (2001) Is the resource based “view” a useful perspective for strategic management research? Yes. *Academy of Management Review* 26(1): 41–56.
- BIS (2012) Following up the Wilson review of business-university collaboration: Next steps for universities, business and governments. Available at: <http://bis.ecgroup.net/Publications/HigherEducation/HEStrategyReports.aspx> (accessed 4 June 2014).
- Boucher G, Conway C and Van der Meer E (2003) Tiers of engagement by universities in their region’s development. *Regional Studies* 37(9): 887–897.
- BPE (2010) Business population estimates for the UK and regions 2010. Available at: [www.gov.uk/government/publications](http://www.gov.uk/government/publications) (accessed on 4 June 2014).
- Cavusgil ST, Calantone RJ and Zhao Y (2003) Tacit knowledge transfer and firm innovation capability. *Journal of Business and Industrial Marketing* 18(1): 6–21.
- Charles D (2006) Universities as key knowledge infrastructures in regional innovation systems. *Innovation* 19(1): 117–130.
- Chaston I, Badger B and Sadler-Smith E (2001) Organizational learning: An empirical assessment of process in small U.K. manufacturing firms. *Journal of Small Business Management* 39(2): 139–151.
- Conner K and Prahalad C (1996) A resource-based theory of the firm: Knowledge versus opportunism. *Organization Science* 7(5): 477–501.
- Cosh A and Hughes A (2010) Never mind the quality feel the width: University-industry links and government financial support for innovation in small high-technology businesses in the UK and the USA. *Journal of Technology Transfer* 35: 66–91.
- Covin JG and Slevin DP (1989) Strategic management of small firms in hostile and

- benign environments. *Strategic Management Journal* 10: 75–87.
- Covin JG and Lumpkin GT (2011) Entrepreneurial orientation theory and research: Reflections on a needed construct. *Entrepreneurship, Theory and Practice* 35(5): 855–872.
- De Clercq D, Sapienza HJ and Crijns H (2005) The internationalization of small and medium-sized firms. *Small Business Economics* 24: 409–419.
- De Clercq D, Dimov D and Thongpapanl N (2010) The moderating impact of internal social exchange processes on the entrepreneurial orientation-performance relationship. *Journal of Business Venturing* 25(1): 87–103.
- Decter M, Cave F, Rose M, Peers G, Fogg H and Peters S (2011) Universities and economic development activities: A UK regional comparison. *Industry and Higher Education* 25(5): 359–374.
- Dess GG, Ireland RD, Zahra SA, Floyd SW, Janney JJ and Lane PJ (2003) Emerging issues in corporate entrepreneurship. *Journal of Management* 29: 351–378.
- Fletcher DE and Watson TJ (2007) Entrepreneurship, management learning and negotiated narratives: ‘Making it otherwise for us – Otherwise for them’. *Management Learning* 38(1): 9–26.
- García-Aracil A and Fernández De Lucio I (2008) Industry–university interactions in a peripheral European region: An empirical study of Valencian firms. *Regional Studies* 42(2): 215–227.
- Gibb AA (2009) Meeting the development needs of owner managed small enterprise: A discussion of the centrality of action learning. *Action Learning: Research and Practice* 6(3): 209–227.
- Grant RM (1996a) Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science* 7(4): 375–387.
- Grant RM (1996b) Toward a knowledge-based theory of the firm. *Strategic Management Journal* 17: 109–122.
- Gustavs J and Clegg S (2005) Working the knowledge game? Universities and corporate organizations in partnership. *Management Learning* 36(1): 9–30.
- Hambrick DC, Geletkanycz MA and Fredrickson JW (1993) Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal* 14(6): 401–418.
- Hansen B and Hamilton RT (2011) Factors distinguishing small firm growers and non-growers. *International Small Business Journal* 29(3): 278–294.
- Hitt MA and Sirmon DG (2003) Managing resources: Linking unique resources,

- management, and wealth creation in family firms. *Entrepreneurship, Theory and Practice* 27(4): 339–358.
- Howorth C and Hamilton E (2012) Family businesses. In: Carter S and Jones-Evans D (ed.) *Enterprise and small business: Principles, practice and policy*. Harlow: Pearson, pp.232–251.
- Huggins R, Johnston A and Steffenson R (2008) Universities, knowledge networks and regional policy. *Cambridge Journal of Regions, Economy and Society* 1: 321–340.
- Hughes M and Morgan R (2007) Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth. *Industrial Marketing Management* 36(5): 651–661.
- Hughes T, Bence D, Grisoni L, O'Regan N and Wornham D (2011) Scholarship that matters: Academic–practitioner engagement in business and management. *Academy of Management Learning and Education* 10(1): 40–57.
- Javalgi RG and Martin CL (2007) Internationalization of services: Identifying the building-blocks for future research. *The Journal of Services Marketing* 21: 391–397.
- Jiménez-Jiménez D and Sanz-Valle R (2011) Innovation, organizational learning, and performance. *Journal of Business Research* 64(4): 408–417.
- Jones O and Macpherson A (2006) Inter-organizational learning and strategic renewal in SMEs: Extending the 4I framework. *Long Range Planning* 39: 155–175.
- Kaya N (2006) The impact of human resource management practices and corporate entrepreneurship on firm performance: Evidence from Turkish firms. *International Journal of Human Resource Management* 17(12): 2074–2090.
- Keh HT, Nguyen TTM and Ng HP (2007) The effects of entrepreneurial orientation and marketing information on the performance of SMEs. *Journal of Business Venturing* 22: 592–611.
- Kourilsky M L and Walstad W B (1998) Entrepreneurship and female youth: Knowledge, attitudes, gender differences, and educational practices. *Journal of Business Venturing* 13(1): 77–88.
- Kreiser PM (2011) Entrepreneurial orientation and organizational learning: The impact of network range and network closure. *Entrepreneurship Theory and Practice* 35(5): 1025–1050.
- Langerak F (2003) The effect of market orientation on positional advantage and organizational performance. *Journal of Strategic Marketing* 11: 93–115.
- Laursen K, Reichstein T and Salter A (2011) Exploring the effect of geographical proximity and University quality on University–industry collaboration in the United Kingdom. *Regional Studies* 45(4): 507–523.

- Lee C, Lee K and Pennings JM (2001) Internal capabilities, external networks, and performance: A study on technology-based ventures. *Strategic Management Journal* 22: 615–640.
- Lee LT and Sukoco BM (2007) The effects of entrepreneurial orientation and knowledge management capability on organizational effectiveness in Taiwan: The moderating role of social capital. *International Journal of Management* 24(3): 549–572.
- Lee H, Kelley D, Lee J and Lee S (2012) SME survival: The impact of internationalization, technology resources, and alliances. *Journal of Small Business Management* 50(1): 1–19.
- Lepoutre J and Heene A (2006) Investigating the impact of firm size on small business social responsibility: A critical review. *Journal of Business Ethics* 67: 257–273.
- Li Y, Guo H, Liu Y and Li M (2008a) Incentive mechanisms, entrepreneurial orientation, and technology commercialization: Evidence from China's transitional economy. *Journal of Product Innovation Management* 25: 63–78.
- Li Y, Zhao Y, Tan J and Liu Y (2008b) Moderating effects of entrepreneurial orientation on market orientation-performance linkage: Evidence from Chinese small firms. *Journal of Small Business Management* 46(1): 113–133.
- Li Y, Huang J and Tsai M (2009) Entrepreneurial orientation and firm performance: The role of knowledge creation process. *Industrial Marketing Management* 38: 440–449.
- Li L, Li D and Weilei S (2011) Internationalization, internalization and the performance of US biopharmaceutical SMEs. *Multinational Business Review* 19: 65–93.
- Lockett N, Kerr R and Robinson S (2008) Multiple perspectives on the challenges for knowledge transfer between higher education institutions and industry. *International Small Business Journal* 26(6): 661–681.
- Lu JW and Beamish PW (2001) The internationalization and performance of SMEs. *Strategic Management Journal* 22(6/7): 565–586.
- Lumpkin GT and Dess G (1996) Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review* 21(1): 135–172.
- Mavondo FT, Chimhanzi J and Stewart J (2005) Learning orientation and market orientation: Relationship with innovation, human resource practices and performance. *European Journal of Marketing* 39(11/12): 1235–1263.
- McDougall PP, Oviatt BM and Shrader R (2003) A comparison of international and domestic new ventures. *Journal of International Entrepreneurship* 1: 59–82.
- Menguc B and Auh S (2006) Creating a firm-level dynamic capability through capitalizing

- on market orientation and innovativeness. *Journal of the Academy of Marketing Science* 34: 63–73.
- Messersmith JG and Wales WJ (2011) Entrepreneurial orientation and performance in young firms: The role of human resource management. *International Small Business Journal* 31(2): 115–136.
- Miller D (1983) The correlates of entrepreneurship in three types of firms. *Management Science* 29(7): 770–791.
- Miller D (2011) Miller (1983) revisited: A reflection on EO research and some suggestions for the future. *Entrepreneurship Theory and Practice* 35(5): 873–894.
- Miller D and Friesen PH (1982) Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal* 3: 1–25.
- Miller D and Le Breton-Miller I (2011) Governance, social identity, and entrepreneurial orientation in closely held companies. *Entrepreneurship Theory and Practice* 35(3): 1051–1076.
- Morris MH, Schindehutte M and LaForge RW (2002) Entrepreneurial marketing: A construct for integrating emerging entrepreneurship and marketing perspectives. *Journal of Marketing Theory and Practice* 10(4): 1–19.
- Morris MH, Webb JW and Franklin RJ (2011) Understanding the manifestation of entrepreneurial orientation in the nonprofit context. *Entrepreneurship Theory and Practice* 35(5): 947–971.
- Niedergassel B and Leker J (2011) Different dimensions of knowledge in cooperative R&D projects of university scientists. *Technovation* 31(4): 142–150.
- Numprasertchai S and Igel B (2005) Managing knowledge through collaboration: Multiple case studies of managing research in university laboratories in Thailand. *Technovation* 25(10): 1173–1182.
- ONS (2012) Regional Profiles: Economy – North West, May 2012. Available at: [www.ons.gov.uk/](http://www.ons.gov.uk/) (accessed on 4 June 2014).
- Pearce II JA, Fritz DA and Davis PS (2010) Entrepreneurial orientation and the performance of religious congregations as predicted by rational choice theory. *Entrepreneurship, Theory and Practice* 34(1): 219–248.
- Philbin SP (2012) Resource-based view of university-industry research collaboration. *PICMET Proceedings: Technology Management for Emerging Technologies*, 400–411.
- Podsakoff PM and Organ DW (1986) Self-reports in organizational research: Problems and prospects. *Journal of Management* 12(4): 531–544.

- Podsakoff PM, MacKenzie SB, Lee J and Podsakoff N (2003) Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology* 88: 879–903.
- Powell J (2012) The university role in the innovative leadership of small to medium sized enterprises: Towards “universities for a modern renaissance” (UMR). *International Journal of Entrepreneurial Behavior and Research* 18(4): 396–416.
- Powers JB (2003) Commercializing academic research: Resource effects on performance of university technology transfer. *Journal of Higher Education* 74(1): 26–50.
- Powers JB and McDougall PP (2005) University start-up formation and technology licensing with firms that go public: A resource-based view of academic entrepreneurship. *Journal of Business Venturing* 20(3): 291–311.
- Rauch A, Wiklund J, Lumpkin GT and Frese M (2009) Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice* 33(3): 761–787.
- Raymond L and St-Pierre J (2013) Strategic capability configurations for the internationalization of SMEs: A study in equifinality. *International Small Business Journal* 31(1): 82–102.
- Real JC, Roldán JL and Leal A (2014) From entrepreneurial orientation and learning orientation to business performance: Analysing the mediating role of organizational learning and the moderating effects of organizational size. *British Journal of Management* 25(2): 186–208.
- Rhee J, Park T and Lee DH (2010) Drivers of innovativeness and performance for innovative SMEs in South Korea: Mediation of learning orientation. *Technovation* 30(1): 65–75.
- Runyan R, Droge C and Swinney J (2008) Entrepreneurial orientation versus small business orientation: What are their relationships to firm performance? *Journal of Small Business Management* 46(4): 567–588.
- Ruzzier M, Hisrich RD and Antoncic B (2006) SME internationalization research: Past, present, and future. *Journal of Small Business and Enterprise Development* 13(4): 476–497.
- Santoro MD and Bierly PE (2006) Facilitators of knowledge transfer in university-industry collaborations: A knowledge-based perspective. *IEEE Transactions on Engineering Management* 53(4): 495–507.
- Sanzo MJ, Santos ML, García N and Trespalacios JA (2012) Trust as a moderator of the relationship between organizational learning and marketing capabilities: Evidence from Spanish SMEs. *International Small Business Journal* 30(6): 700–726.
- Siguaw JA, Simpson PM and Enz CA (2006) Conceptualizing innovation orientation: A

- framework for study and integration of innovation research. *Journal of Product Innovation Management* 23(6): 556–574.
- Simpson M, Taylor N and Padmore J (2011) The role and relevance model of marketing in SMEs. In: Nwankwo S and Gbadamosi A *Entrepreneurship marketing: Principles and practice of SME marketing*. Abingdon: Routledge, pp.30–44.
- Simsek Z, Veiga JF and Lubatkin MH (2007) The impact of managerial environmental perceptions on corporate entrepreneurship: Towards understanding discretionary slack's pivotal role. *Journal of Management Studies* 44(8): 398–424.
- Simsek Z, Heavey C and Veiga JF (2010) The impact of CEO core self-evaluation on the firm's entrepreneurial orientation. *Strategic Management Journal* 31: 110–119.
- SME Statistics (2010) Small and medium-sized enterprise (SME) statistics for the UK and regions, 2009: Methodology note. Available at: <http://stats.bis.gov.uk/ed/sme/> (accessed on 4 June 2014).
- Smith S, Rose M and Hamilton E (2010) The story of a university knowledge exchange actor-network told through the sociology of translation: A case study. *International Journal of Entrepreneurial Behavior and Research* 16(6): 502–516.
- Spicer DP and Sadler-Smith E (2006) Organizational learning in smaller manufacturing firms. *International Small Business Journal* 24(2): 133–158.
- Stam W and Elfring T (2008) Entrepreneurial orientation and new venture performance: The moderating role of intra- and extra-industry social capital. *Academy of Management Journal* 51(1): 97–111.
- Tang YK (2011) The influence of networking on the internationalization of SMEs: Evidence from internationalized Chinese firms. *International Small Business Journal* 29(4): 374–398.
- Ucbasaran AD (2004) *Business ownership experience, entrepreneurial behavior and performance: Novice, habitual, serial and portfolio entrepreneurs*. PhD Thesis, University of Nottingham, UK.
- Wales WJ, Gupta VK and Mousa F-T (2013) Empirical research on entrepreneurial orientation: An assessment and suggestions for future research. *International Small Business Journal* 31(4): 357–383.
- Walter A, Auer M and Ritter T (2006) The impact of network capabilities and entrepreneurial orientation on University spin-off performance. *Journal of Business Venturing* 21: 541–567.
- Wang CL (2008) Entrepreneurial orientation, learning orientation, and firm performance. *Entrepreneurship Theory and Practice* 32(4): 635–657.
- Weaven S, Grace D and Manning M (2009) Franchisee personality: An examination in the

- context of franchise unit density and service classification. *European Journal of Marketing* 43(1/2): 90–109.
- Westhead P, Wright M and Ucbasaran D (2004) Internationalization of private firms: Environmental turbulence and organizational strategies and resources. *Entrepreneurship and Regional Development* 16: 501–522.
- Westhead P and Howorth C (2006) Ownership and management issues associated with family firm performance and company objectives. *Family Business Review* 19(4): 301–316.
- Wiklund J and Shepherd D (2003) Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal* 24: 1307–1314.
- Wiklund J and Shepherd D (2005) Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing* 20: 71–91.
- Wiklund J, Patzelt H and Shepherd D (2009) Building an integrative model of small business growth. *Small Business Economics* 32: 351–374.
- Wilson T (2012) A review of business–university collaboration. Available at: <http://bis.ecgroup.net/Publications/HigherEducation/HEStrategyReports.aspx> (accessed on 6 June 2014).
- Worthington I, Ram M and Jones T (2006) ‘Giving something back’: A study of corporate social responsibility in UK South Asian small enterprises. *Business Ethics: A European Review* 15(1): 95–108.
- Wright M, Westhead P and Ucbasaran D (2007) Internationalization of small and medium-sized enterprises (SMEs) and international entrepreneurship: A critique and policy implications. *Regional Studies* 41(7): 1013–1029.
- Wright M, Clarysse B, Lockett A and Knockaert M (2008) Mid-range universities’ linkages with industry: Knowledge types and the role of intermediaries. *Research Policy* 37(8): 1205–1223.
- Zhao Y, Li Y, Lee SH and Chen LB (2011) Entrepreneurial orientation, organizational learning, and performance: Evidence from China. *Entrepreneurship Theory and Practice* 35(2): 293–317.

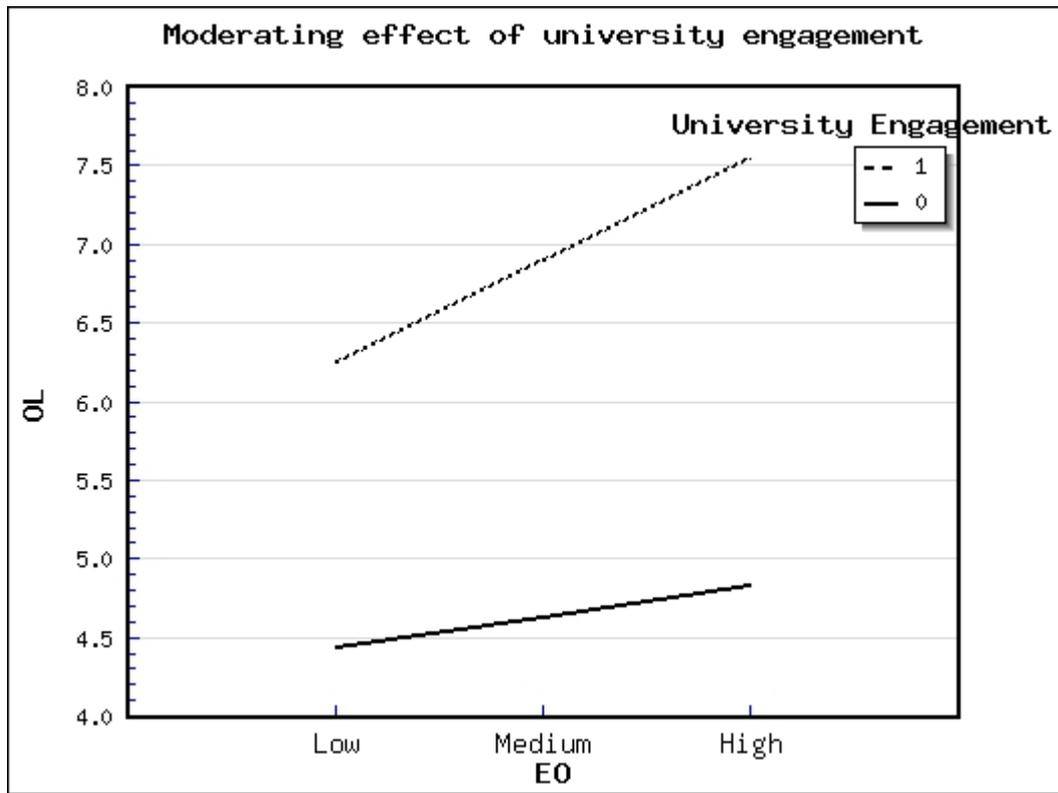


Figure 1. Moderating effect of university engagement on EO-OL relationship.

Variables	M	S.D	1	2	3	4	5
1. Organizational learning (OL)	2.91	0.87	1.00				
2. Entrepreneurial orientation (EO)	2.94	0.73	0.214**	1.00			
3. Business/university engagement	0.17	0.37	0.204**	0.069	1.00		
4. Firm size	111.53	200.10	0.075	0.038	-0.021	1.00	
5. Firm age	42.02	46.11	-0.083	0.105	0.029	0.171*	1.00

**Table 1.**  
Means,  
standard  
deviations,  
and  
correlations of  
the variables

*n* = 206.

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Variable	Model 1	Model 2	Model 3	Model 4
Constant	(0.000)***	(0.000)**	(0.000)***	(0.000)***
Firm age	-0.082	-0.074	-0.092	-0.084
Firm size	0.065	0.058	0.066	0.062
Family ownership	-0.120	-0.081	-0.085	-0.074
Managing Director/Top Executive's age	-0.217(0.004)**	-0.203 (0.007)**	-0.175 (0.017)*	-0.197 (0.008)**
Social performance	0.161 (0.054)†	0.120	0.127	0.134 (0.096)†
Sales growth	0.101	0.102 (0.088)†	0.074	0.083
Business/university engagement			0.224 (0.003)**	0.191(0.011)*
Entrepreneurial orientation (EO)		0.208 (0.007)**	0.194 (0.011)*	0.216(0.004)**
Business/university engagement * EO				0.162(0.029)*
F value	1.853 (0.029)*	2.248 (0.018)*	2.732 (0.000)***	2.907 (0.000)***
R <sup>2</sup>	0.155	0.192	0.236	0.259
Adjusted R <sup>2</sup>	0.071	0.106	0.150	0.170

**Table 2.**  
Direct effect of  
EO on OL and the  
moderating effect  
of university  
engagement:  
Regression results

Industry dummies were included but they were not statistically significant. As a result, the industry dummy results were not reported in Table 2.

Standardized coefficients are reported in the table; *p* values are in parentheses with:

\*\*\* *p* < 0.001;

\*\* *p* < 0.01;

\* *p* < 0.05;

† *p* < 0.10.