

## MANAGING INTANGIBLE ASSETS FOR SMALL FIRM GROWTH

Gavin C Reid<sup>1</sup>, Julia A Smith<sup>2</sup> and Zhibin Xu<sup>3</sup>

<sup>1</sup>Professor, Honorary Professor in Economics & Finance, University of St Andrews, School of Economics & Finance Castlecliffe, The Scores, United Kingdom. E-mail: [gc@st-andrews.ac.uk](mailto:gc@st-andrews.ac.uk)

<sup>2</sup>Reader in Accounting and Finance, University of Strathclyde, Strathclyde Business School University of Strathclyde, 199 Catbedral Street, United Kingdom. E-mail: [Julia.smith@strath.ac.uk](mailto:Julia.smith@strath.ac.uk)

<sup>3</sup>Research Affiliate in Economics & Finance, University of St Andrews, School of Economics & Finance Castlecliffe, The Scores, United Kingdom. E-mail: [zhibin\\_xu@hotmail.com](mailto:zhibin_xu@hotmail.com)

### Article History

Received : 16 March 2023

Revised : 05 April 2023

Accepted : 26 April 2023

Published : 30 June 2023

### To cite this article

Gavin C Reid, Julia A Smith & Zhibin Xu (2023). Managing Intangible Assets for Small Firm Growth. *Journal of Applied Financial Econometrics*, Vol. 4, No. 1, pp. 61-87. <https://DOI:10.47509/JAFE.2023.v04i01.04>

**Abstract:** The aim of this paper is to explore the impact of various intangible assets on growth in the small firm. It starts with the hypothesis that superior firm performance depends upon aspects of the entrepreneur's orientation and the resources they own and control. This approach corresponds to the entrepreneurship and resource-based views that can be found in mainstream, western literature. However, the goal here is to extend this analysis to small firms in the developing world. We use empirical evidence, to which we apply statistical and econometric analysis. The data are gathered anew from a fieldwork-based study of private firms. This was undertaken by face-to-face interviews using an administered questionnaire developed for the purpose. For our sample, we find that entrepreneurial attributes have little significant impact on small firm growth, whereas intangible asset attributes have a positive and significant impact on growth. Our paper suggests that, as far as our empirical evidence goes, little can be attributed to entrepreneurship, in terms of performance and growth, but rather that intangible assets are of key importance. An ability to build upon and exploit these intangibles can therefore help the owner-manager of a small entrepreneurial firm to achieve growth and to improve performance.

**Keywords:** firm growth, size, entrepreneurship, technology, networking

**JEL Codes:** L2; D22; L1

## 1. INTRODUCTION

This paper sets out, first, to measure and calibrate entrepreneurship and accounting-based classifications of intangible assets; and, second, to discover their impact on the growth of Chinese private firms at the microeconomic level (cf. Jarrar & Smith, 2014;

Rhodes et al, 2011; Schiff, 2013). Findings suggest that superior firm performance depends on the entrepreneur's orientation and the resources they own and control (cf. Bisbe & Malgüeño, 2015; Chenhall et al, 2011; Deb & Wiklund, 2017). The approach taken corresponds to the entrepreneurship and resource-based views found in mainstream western literature on the growth of the firm. However, here, the analysis extends to small firms in the developing world.

The paper employs empirical analysis, applying statistical and econometric techniques to new fieldwork-based data which was gathered by face-to-face interviews using an administered questionnaire in the Guangdong Province of PR China (hereafter simply 'China'). New instrumentation was designed to capture the intent and content of the complex concepts of entrepreneurship and intangible assets. The work extends a size- and age-based model of the small firm to define growth as a function of size, age, entrepreneurship and intangible assets. It then use statistical analysis to create measures of entrepreneurship and intangible assets from these data. Intangible assets are classified into six categories: human capital; enterprise culture, intellectual property; technology; reputation; and network. Finally, models of small firm growth are estimated using these new measures.

Using statistical techniques this paper make the abstract concepts of entrepreneurial orientation (EO) and intangible assets (IA) operational for the first time. The newly-defined measures are incorporated into a new specification of an econometric growth model for the small firm. The primary implications of this paper are, therefore, that: first, while EO and IA are defined as two abstract constructs at a higher level, they are capable of empirical measurement and implementation; and second, both EO and IA can be used to generalise and extend existing models of small firm growth. EO is found to be insignificant in its impact on growth, whilst IA is found to be a highly significant and positive in its impact on growth.

It is found that entrepreneurial attributes have little significant impact on small firm growth, whereas intangible asset attributes have a positive and significant impact on growth. The entrepreneur's network, technological knowledge and the enterprise culture are all positively and significantly associated with better performance. Further, there is a suggestion that the quality of intellectual property has some positive impact. Therefore the aim is achieved of measuring two complex and multidimensional concepts, entrepreneurship and intangible assets, and using these in econometric models of firm performance. As far as empirical evidence goes, little can be attributed to entrepreneurship, in terms of performance and growth; rather, intangible assets are of key importance. An ability to build upon and exploit these intangibles can therefore help the owner-manager of a small entrepreneurial firm to achieve growth and to improve performance.

## 2. THEORETICAL BACKGROUND

It is apparent that a firm cannot grow without the willingness of entrepreneurs (or owner-managers), actually to create new commercial organizations that will satisfy their aspirations, and serve their other purposes. Whilst the nature of the entrepreneur is still far from agreed (e.g. Say's 'coordinator', Knight's 'uncertainty bearer', Kirzner's 'arbitrager' and Schumpeter's 'innovator'), the development of thought on entrepreneurship has involved the accumulation of a rich, yet diverse and fragmented body of knowledge (e.g. Baumol, 1996; Blanchflower & Oswald, 1998; Davidsson, 2015; Shane & Venkataraman, 2000; Miller and Toulouse, 1988; Bird, 1993; Begley, 1995). From our point of view, a comprehensive view of entrepreneurship might be that the entrepreneur is a manager who drives change, pursues opportunity and creates new value in an innovative way. This willingness to engage in such entrepreneurial behaviour is thereby defined as *entrepreneurial orientation* (EO) (cf. Bisbe and Malueño, 2015; Deb & Wiklund, 2017; Jarrar & Smith, 2014), which is at the core of entrepreneurship (Lumpkin and Dess, 1997; Brown, 1996; Wiklund, 1998). Nonetheless, the link between this core conception of entrepreneurship (i.e. EO) and its implications for small firm growth/performance are not straightforward, to judge by prior research in the West. Some would claim a strong, positive influence between the two (Zahra, 1991; Zahra and Covin, 1995; Wiklund, 1998), or at least a muted one (Rauch, et al. 2009); whereas others would claim no significant positive impact of EO on growth at all, or even a negative impact (Hart, 1992; Smart and Conant, 1994; Auger, et al., 2003). Thus, one of the several purposes of this paper is to conceptualize EO, within the setting of the Chinese economy, and then to examine its relationship with the growth of Chinese firms (cf. Schiff, 2013).

The other prerequisite for success is 'resource', as in the resource-based view of the firm (e.g. Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Teece et al., 1997). If entrepreneurship is a process which 'represents the alert becoming aware of what has been overlooked' (Kirzner, 1977), then the resource-based view of the firm reminds one of what has been possessed, within the reach of entrepreneurial action, and of what outcomes, in the real world that the firm inhabits, can be attributed to its actions. The seminal work of Penrose (1959) particularly referred to resources as 'productive services' (i.e. tangibles) and 'managerial services' (i.e. intangibles). Other categorizations of resources are also suggested in the literature. While Hofer and Schendel (1978) suggested six types, viz. financial resources, technological resources, physical resources, human resources, reputation, and organizational resources, Collis (1994) and Galbreath (2005) advocated a simple dichotomy between tangible and intangible resources. See also Skinner (2008) for a useful conspectus of policy recommendations on accounting for intangibles. Although the continuous availability of tangibles and the supply, release

and growth of intangibles were both perceived to influence business expansion directly, lack of appropriate managerial services was taken as the principal constraint on growth. The renowned 'Penrose Effect' was later modelled by Slater (1980) who formalised mathematically the positive relationship between 'managerial services' and firm growth. Slater's model (1980) also argued that high growth-oriented firms may initially start with a lower output level, which equally amounts to saying that smaller sized firms may grow faster, a departure from Gibrat's law. Others have also more recently used this idea to explore firm growth (e.g. Chen et al., 2019; Eide et al., 2021; Lin et al., 2020). In the later extensive development of research in this field, intangible resources were also characterized as being 'core competences' by Hamel and Prahalad (1990), 'skills' by Hall (1992), or 'capabilities' by Nelson and Winter (1982). Regardless of these disparate labels, it is a widely held view that a firm's success may largely depend on the intellectual capital or *intangible assets* (IA) it owns and controls (Bisbe & Malgüeño, 2015; Cuganesan, 2005; Dumay, 2016). Extending this line of thought, see Basu & Waymire (2008) for an interesting discussion of the increasing importance of intangibles, from both historical and international perspectives.

In China, after more than two decades of rapid economic development that greatly consolidated the infrastructure of the nation, it became a marked concern, amongst policy makers for the Chinese economy, that the nation should realize its 'intangibles'. Though they are rare, heterogeneous and difficult to create, imitate or substitute (Wiklund, 1998), it was felt that their acquisition should be given priority. See Wan et al (2015) for example, for a discussion of the increasing importance of intangible compared to tangible resources in Chinese wood-product companies. Following this lead, another important aim of this paper is to measure empirically the intangible assets (IA) that are owned by Chinese private firms, as well as to examine their role in driving the expansion process which is helping to cause the transition of the Chinese economy.

Intellectual capital (cf. Cuganesan, 2005) incorporates aspects of human, relational and structural capital. In this context, the first Intangible Asset (IA) we explore is human capital (Huang et al., 2013; Souiraris et al., 2022; Uliana et al., 2005), which we define as 'the skills, general or specific, acquired by an individual in the course of training and work experience' (Law, 2009). This kind of IA may be expressed in operational form as: (a) educational, technical, or vocational certificates held by employees; (b) compensation levels for performance level, as compared to the average industry level; (c) work records; and (d) period of job incumbency (Grant, 1997). Whilst we do use the first two items, which are measured in our study as the extent of higher education among employees (*Diploma*) and the compensation level compared with the industry average (*Salary*), evidence on the latter two are not generally available from Chinese owner-managers, so we cannot measure them. Fortunately we do have other

measures. For example, the number of enterprise stimulation schemes (*Nstimula*) is reported, since policy makers judge that the greater the stimulation, the lesser the work disputes and lower the job turnover. Furthermore, additional variables are suggested by the work of Colombo and Grilli (2005) which has particularly focused on the educational background and prior working experience of founders of new firms. Therefore the implementation of training programmes (*Training*), and the frequency of top management training (*Toptrain*), were recorded by us as measuring further dimensions of human capital.

The second proposed component of IA is enterprise **culture** (Agbejule, 2011; Busco & Scapens, 2011), where culture is defined as ‘the values, beliefs, norms, and traditions within an organization that influence the behaviour of its members’. Differences in factors like level of formality, loyalty, respect for long service, and so on, often vary significantly across firms. This gives each one a distinctive ethos, upon which is predicated the conduct of new recruits, Law (2009). It can be disaggregated into communication, openness to change, job design, job pressure, organizational integration, leadership, vision, and so forth (Eggers et al., 1996). In the same vein, the number of communication channels (*Commun*) is operationalized into enterprise culture as a tool for assessing the smoothness of two-directional communication. The flexibility of changing firm codes and regulations (*Codes*) reflects the basic attitude towards the change of management. Moreover, the frequency of company social activities (*Social*) is judged to help release job pressures and to reinforce organizational integration. The influence of entrepreneurs on their enterprise culture (*Leader*) and company slogan (*Slogan*), respectively, aim to reflect the leadership and firm vision. Finally, the standard of working conditions (*Workcon*) is also thought to be a part of enterprise culture, especially when this standard certainly benefits the employees today, rather than pandering to the dubious ‘political inspections’ of the past. Good working conditions were usually important for winning so-called ‘hygiene competitions’ which were organized by local government in China in the 1980s and early 1990s, notably before the large scale privatisations of 1997.

Intellectual property (IP) is usually defined by reference to copyrights, patents and trademarks (Dumitrescu, 2012; Hall, 1992; Kianto et al, 2013). Although the majority of Chinese firms in the sample do not hold any type of copyrights or patents, it is informative to ask if they do (*Patent*) and (if so) how many they hold (*Npatent*). Galbreath (2005), reflecting modern trends, has, by his work, suggested two more variables to add to the IP pool, namely trade secrecy in two forms, as either ‘held-in-secrecy’ techniques, or as designs. Considering the acutely sensitive nature of these forms of IP, we were highly doubtful whether Chinese entrepreneurs, who are legendary for their strict business discretion, would tell us anything at all about them, even if they existed.

However, another viable IP variable is the establishment of an R&D branch or technical centre (*RDbranch*), wherein such trade secrecy, as well as regular forms of proprietary IP, may be generated (cf. De Waegenare et al., 2012).

Whilst intellectual property (IP) is a relatively straightforward concept to put into operation, this is not true of technological knowledge or, more simply, but more ambiguously, technology. It is troublesome, because, as an area of enquiry, it substantially overlaps with other aspects of the EO perspective and the resource-based view of the firm. In Grant's (1997) illustration, technology is embodied in (a) the number of patents, (b) the ratio of R&D staff to the total employment, and (c) the revenues generated by patents. The first two resemble the attribute of innovativeness in EO and  $N_{patent}$  in terms of intellectual property, whereas the third is harder to measure. Given such difficulties, here we adopt the methodology of Spender (1996), as later developed by Neck et al. (2000), and utilize the following measures of technology: conscious technological know-how (self-rated technology level, *Tech*); and objectified technology (the implementation of international quality standard, *ISO*; the types of computer software used, *Software*) (cf. Dumistrescu, 2012). The higher the value of any of the variables above, the higher is the level of technical know-how estimated.

Reputation is a critical intangible asset (cf. Guilding & Pike, 1990; Yu Wong et al., 1998). While Hall (1992) simplified organizational reputation as being corporate image and brand name (cf. Davison, 2009), Grant (1997) operationalized the idea by suggesting measures such as: the price difference with competing products; the repeated purchasing rate of existing customers; company financial performance over time; and product quality perception. In an SME context, the latter approach seems more appropriate, and the major indicator of reputation in this study is originally designed as the perception of product quality, in relation to substitutes (better, equal or lower). Yet the data revealed that a large percent of respondents did not report this variable, due to the varying individual interpretation of the scope of substitutes. Hence, the missing data force an alternative approach that measures the promotion of firm reputation by advertisement (*Ads*), the media types of advertisement (*Adsmedia*), and the launch of a company website (*Website*). Although reputation is not now gauged directly, it is hoped that these efforts to measure 'face' may be also revealing.

Last but not least, network plays a pivotal role among all components of IA (cf. Moeller, 2010; Nielsen & Montemari, 2012). 'Guan xi', a proxy for personal network in China, is deeply rooted in its ancient culture (Lu, 2012). In the empirical literature, this extraordinary intangible asset is variously labelled as 'broad network' (Butler and Brown, 1994), 'connectivity' (Rickne, 2001), 'relation mix' (Lechner et al., 2006), or 'inter-firm relations' (Havnes and Senneseth, 2001). Ding et al (2015), for example, discuss the extent to which political connections have an impact upon executive compensation in

China. See Yu Wong et al (1998) for a deeper understanding of the peculiarities of Chinese culture and the problems this poses for business outsiders. Concerned as it is with such complexity of networks, our work recognises a variety of relationships based on the available dataset collected in the fieldwork. For instance, the sources of initial financing (*Knet*) reflect a firm's external financial relationship, whereas the sources of advice (*Advinet*) for founding the firm show the firm's 'relation mix' at business inception. Further, the number of technological partners (*Technet*) and the number of suppliers (*Supnet*) describe specific network relations in terms of technology and the supply chain, respectively. It is hypothesized that the value-adding process of IA can thereby be facilitated by having a broader network.

### 3. METHODOLOGY

This section develops the empirical underpinning of our paper. First, the fieldwork methods, instrumentation and sampling are explained. Then we report upon our preliminary statistical analysis: binary correlation analysis is undertaken of the intangible attributes, to discard marginal attributes, and to achieve a high reliability of factors. We also report reliability tests which were conducted to identify those attributes that can form an internally consistent scale (and to remove those that do not). All statistical computations were carried out using SPSS 12.0.

#### Fieldwork and Instrumentation

The evidence used in this article was gathered by structured interviews, which involved face-to-face interviews with entrepreneurs of a group of sampled firms trading in the Guangdong Province of China. Gatekeepers to the field were obtained by personal referrals, as Chinese entrepreneurs are notoriously secretive about their business operations, and trusted sources are essential to getting reliable evidence. These referrals were provided by a large student body (nearly 180 undergraduate students majoring in international business or finance, with English) and teaching staff (nearly 80), all of whom were from strong family business backgrounds. All were affiliates of the School of English for International Business (SEIB) at Guangdong University of Foreign Studies (GDUFS). This access was facilitated by one of the authors lecturing in entrepreneurship at GDUFS over the period 2004-2005. The selection criteria were that a sampled firm should be: (a) privately owned, (b) financially independent (not a subsidiary), and (c) located in the territory of Guangdong Province. From an initial sampling frame of 110 firms, twelve firms were dropped for failing criterion (c), and another nine firms were dropped because of personal circumstances of the entrepreneurs (e.g. illness). The response rate was 90.8%. This high response rate demonstrates the benefit of 'guan xi'.

Ideally one would select firms randomly from a sampling frame (e.g. yellow pages), to create a probabilistic sample. However, most owner-managers of Chinese firms simply ignore postal questionnaires if they are not officially backed; and if they are, the data can often be unreliable. Given Chinese mores, it is unrealistic to expect any chief executive officer (CEO), or deputy, to talk for at least 90 minutes (our typical interview time) face-to-face or on the telephone, on a ‘cold call’ basis. You have to be an insider to get this sort of privilege. As ‘guan xi’, the trusted network connection, is essential to fieldwork research of our kind, standard statistical sampling had to be ruled out. As Scott and Marshall (2005) have argued, ‘studies of (for example) members of a religious sect rarely require probability sampling: a selection of the membership ...is usually considered to be sufficient.’ Whilst it is certainly improper to regard a Chinese business community as a religious group, it can appear equally mysterious and unapproachable, if the fieldworker has no trusted connection with the community. Fortunately, our sample characteristics provide reasonable assurance about the usefulness of our evidence for testing theories of entrepreneurship – and specifically about the determinants (e.g. EO and IA) of small firm growth. This point is illustrated by size distribution evidence below.

The National Bureau of Statistics (NBS) of China convention for the relevant time period is that an enterprise is a small firm if employment is below 600 or sales are below 30 million Chinese Yuan (equal to 1.93 million British Pounds). The exchange rate for this conversion was set at the average level in January, 2005. Medium sized firms have sales between 30 and 300 million Chinese Yuan, or employ less than 3,000 full-time workers. Beyond this scale, firms are considered to be large. The size distribution by employment is given in Table 1.

**Table 1: Size Distribution by Employment of Firms in Sample and in Guangdong Province**

	<i>Sampled Firms</i>	<i>Guangdong Firms</i>
Small	77(92.8%)	15409(88.1%)
Medium	5(6.0%)	1285(7.3%)
Large	1(1.2%)	794(4.5%)
Total	83(100%)	17488(100%)

*Note to Table 1:* Source for column 2 – The National Bureau of Statistics (NBS) China, 2005

In Table 1, size by employment in the sample is highly correlated with the Guangdong population of firms. Using a non-parametric test Kendall’s  $\tau_b$  applied to the cross tabulation of Table 1, we get a test statistic that is approximately unity (to four significant figures) which has a very small (almost zero) probability value. We



conclude that we have a sample which is an excellent representation of the size distribution of the population of small firms.

Our survey instrument, an administered questionnaire, was designed to provide: (a) key statistics on private firms in the Guangdong Province; (b) statistics to calibrate the growth of these firms; and (c) data for exploring the causality between multiple attributes (specifically EO and IA) and firm growth. The administered questionnaire had eight sections:

1. Background
2. Firm operations
3. Human resource management
4. Finance
5. Technology and innovation
6. Enterprise culture
7. Competition
8. Macro environment

The administered questionnaire contained 106 numbered questions in qualitative and quantitative forms. Whilst the former type enables respondents to provide the qualitative information in his/her particular situation, the latter supplies the numerical data in a relatively more objective way. Our aim was to maximize the quality and quantity of information flow, by gathering evidence of both a qualitative and a quantitative nature (Tashakkori and Teddlie, 1998). For a discussion of the issues of undertaking qualitative fieldwork in a developing country see, for example, Hossain et al (2015). See also Shafer & Simmons (2011) for a field survey on the nature of organizational ethical culture in China. Our questions were organized in a variety of formats, such as blank-filling, multiple-choice (permitting either a single answer or multiple answers) and true/false questions. We regarded previously successful question designs as our point of departure. In terms of the empirical literature, our yardsticks for questionnaire design include e.g. Converse and Presser (1986), Reid (1988, 1993), and Fowler (1995). The answers to questions generated a wide variety of variables. The subset of these used in this paper are defined precisely in the Appendix to this paper.

As we were targeting Chinese privately owned firms, whose owner-managers had diverse educational and cultural backgrounds, the questionnaire was written in 'simplified Chinese', which is now widely used in Mainland China, while traditional Chinese is used mainly in Hong Kong, Macau and Taiwan. As all our interviewees were native Chinese (and not necessarily English speaking) a questionnaire written in Chinese was believed to be indispensable. Responses to questions were also written

in Chinese, to ensure that nothing would be missed by interview as a consequence of language barriers.

#### 4. EVIDENCE

Our analysis of how to define and measure EO, and its attributes, suggested 16 variables, under six categories (viz. innovation, 4; risk-taking, 3; pro-activity, 5; competitive aggression, 2; autonomy, 2), as being fit for this task. They all comply with the advisory rules relevant to our intended statistical analysis (viz. internal consistency, factor analysis, regression analysis) as regards: sample size ( $n = 83 \geq 50$ ); and the ratio between sample size and the number of attributes to be factor analysed ( $\geq 5$  cases;  $83/16 \geq 5$ ). We used Cronbach's (1951)  $\alpha$  as a statistical measure of the internal consistency of our data set. It gauges the extent to which our set of attributes measures a single one-dimensional latent construct. In our case, the relevant latent constructs are 'entrepreneurship' or 'intangible assets'. We found that the overall Cronbach's  $\alpha$ , based on all our standardized attributes, is 0.42, which is below the acceptable level of 0.7 (Nunnally, 1978), suggesting that entrepreneurial orientation is *not* unidimensional.

Operational content is given to IA using a statistical procedure. The 26 attributes, derived from our review of empirical studies give us a reassuringly high Cronbach  $\alpha$  of 0.76. However, our factor analysis cannot use all attributes, since this would breach the recommended ratio ( $n/m \geq 5$ ) between sample size ( $n$ ) and the number of attributes ( $m$ ) to be factor analysed, as  $n/m = 3.19$ . An inter-item correlation analysis was therefore undertaken, in order to filter-out the less important attributes of our universal concept, as indicated by the data of Table 2. Note that in Table 2 we have the notation that Pearson's correlation coefficient is significant at the: 0.01 level (\*\*); 0.05 level (\*); 1-tailed test.

Based on the inter-item correlations of Table 2, ten attributes were dropped. We retain the 16 the most relevant attributes, thus achieving compliance with the criteria that:  $(n/m) = 83/16 \geq 5$ ; and that the coefficient  $\alpha = 0.703 \geq 0.70$ . The KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) measure of homogeneity of variables is adequate at 0.627, and Bartlett's test of sphericity (i.e. departure from orthogonality) is also significant at the 0.01 level (approx.  $\chi^2 = 295.174$ ; and d.f. = 120). We turn now to the exploratory factor analysis of IA. Our aim is to discover the factor structure ('theory') which best explains the correlations among our variables. Explanatory factor analysis was used to extract six factors of IA (viz. intellectual property, human capital, reputation, networks, technology, enterprise culture) by the method of principal components, with varimax and direct oblimin rotations. This explained 66% of the total variance. Although some of the IA factors extracted had relatively small  $\alpha$  coefficients, the overall  $\alpha$  coefficient (0.703 for 16 items) was acceptable.

With regard to the 16 variables under IA, six factors of high reliability have been extracted. They are broadly consistent with our prior knowledge of IA, largely based on the empirical studies we reviewed in the second Section (on IA), but with a few new characteristics. For example, the factor *Intellectual property* had largely been related to attributes of patents (like  $N_{patent}$ ), but now this has been extended to: international quality standards (e.g. ISO9000) (*ISO*); and the establishing of an R&D unit or a technical development centre (*RDbranch*) within the firm. Further, our *Human capital* factor quite naturally embraces the attributes of: training for senior managers (*Toptrain*); and the use of enterprise stimulation schemes (*Stimula*). Less obvious is its embracing of socializing activity (*Social*), regarded not as a part of enterprise culture, but rather as an activity that works through human resource management to enhance the capabilities, skills and efforts of employees. Such socializing activities play an efficacious role in reducing work disputes and increasing the average period of job tenure. This is to the benefit of 'learning by doing' and related vectors of worker-driven technical change, all of which are expected to enhance the quality of *human capital*.

Unsurprisingly, advertisements (*Ads*) and a variety of channels (*Adsmedia*) are important attributes of the firm's *Reputation* (considered here as a key factor). The *Network* factor's attributes are the relationship with technical partners (*Technet*), and with suppliers (*Supnet*). The factor *Technological Knowledge* has three attributes: self-perceived technological level (*Tech*) compared with the industry average; the use of software (*Software*); and the launch of a website (*Website*). Finally, the attributes of the factor *Enterprise Culture* are a firm's openness to change (as measured by flexibility to change company codes, *Codes*), and business leadership (measured here in terms of entrepreneurial influence, *CultureS*). Although some attributes now fall into different categories, in terms of factors, compared to our preliminary operationalization, the six principal factors we have extracted are generally robust and congruent with our previous framework.

## 5. ANALYSIS

We now devise and estimate a multiple regression model of firm growth, which calibrates and shows the influence of EO and IA on firm growth, as measured by employment growth. We use the full set of attributes available to us. Estimation is by ordinary least squares, with corrections for heteroskedasticity, and for sample selection bias. First we must translate EO and IA, as abstract concepts, into empirical reality. To do so we produce an index for each concept, based on their attributes as indicated by the factor analysis. The process of indexation utilises the identity expressed by:

$$Index = \sum_i^n (weight_i \times attribute) \quad (1)$$

Table 2: Inter-item Correlations of Preliminary IA attributes

	Substi	Ads	Ads-media	Kinet	Tech-net	Sup-net	Adv-Net	Ebiz	Communi	Npatent	Website	Iso	Software	Codes	Stegan	Social	Work-con	Cultures	Diploma	Salary	Training	Stimula	Top-train	Patent	RD-branch	
Substi	1																									
Ads	0.01	1																								
Ads-media	0.133	.639***	1																							
Kinet	-0.091	0.093	0.151	1																						
Tech-net	0.015	-0.041	0.012	-0.09*	1																					
Sup-net	0.009	0.004	0.005	-0.03*	.344***	1																				
Adv-Net	0.055	0.104	0.144	0.032	0.097	-0.094	1																			
Ebiz	0.119	.261***	0.103	0.079	0.032	0.176	-0.056	1																		
Communi	-0.051	.291***	.182*	-0.15*	0.09	0.125	-0.092	.364***	1																	
Npatent	.462**	-0.004	0.058	-0.03*	0.001	0.061	-0.124	.280**	0.02	1																
Website	0.042	.294***	.444***	0.128	0.118	0.095	-0.145	.421**	0.163	.269**	1															
Iso	0.175	0.146	.216*	-0.01*	.238*	0.182	0.074	.484**	.374**	.344**	.333**	1														
Software	0.15	0.07	0.147	-0.05*	0.102	0.101	-0.053	.207*	0.127	-0.022	.394**	0.175	1													
Codes	-0.012	0.033	0.082	0.039	-0.041	-0.194*	-0.078	0.008	0.01	0.077	0.109	0.142	0.003	1												
Stegan	0.003	0.061	0.120	0.162	.222*	.002	0.018	0.071	0.081	0.100	.236*	0.165	0.069	-0.137	1											
Social	0.032	.213*	.226*	0.177	-0.073	.283**	-0.075	0.154	0.163	0.07	.408**	0.079	.309**	.241*	.191*	1										
Work-con	0.172	-0.07	-0.022	0.17	0.079	0.069	-0.147	0.174	0.018	0.155	.214*	0.159	.265**	-0.027	0.017	.229*	1									
Cultures	-0.165	-0.082	-0.127	.293**	-0.184	-0.056	-0.043	0.045	-0.008	0.007	-0.018	-0.043	-0.096	.359**	0.053	0.03	-0.056	1								
Diploma	0.118	.237*	.241*	-0.18	-0.088	-0.056	.276**	0.12	0.143	-0.087	.197*	0.07	.314**	-0.053	0.034	.231*	0.035	-0.163	1							
Salary	-0.026	-0.063	-0.056	-0.192*	0	0.075	0.132	0.102	0.059	.220*	-0.012	0.186*	0.156	0.034	0.102	0.076	0.014	-0.026	.203*	1						
Training	0.112	.241*	0.1	0.024	0.123	0.055	0.071	.305**	.213*	0.088	.280**	.283**	.201*	-0.04	.274**	.220**	0.146	0.175	0.057	0	1					
Stimula	0.065	0.097	0.155	0.06	0.168	.266**	0.015	.272**	.317**	.195*	.198*	.239*	.199*	0.17	0.056	.278**	0.162	-0.001	.186*	.217*	0.102	1				
Top-train	-0.018	.214*	0.138	.250*	0.043	0.181	-0.05	.189*	.200*	0.072	.241*	0.051	.246*	-0.018	.319**	.441**	.194*	-0.042	0.087	0.053	0.14	.342**	1			
Patent	0.073	0.053	0.056	-0.002	0.026	-0.01	-0.003	.335**	0.117	.528**	.293**	.427**	-0.082	0.03	.270**	-0.024	0.022	0.03	0.011	.244*	0.014	0.048	0.092	1		
RD-branch	.286**	-0.011	0.109	-0.007	.268**	.277**	-0.079	.233*	0.107	.299**	.303**	.479**	.251*	.196*	.247*	0.173	.345**	-0.016	0.067	0.12	.221*	.232*	.251*	.390**	1	

Note: Pearson's correlation coefficient, significant at the: 0.01 level (\*\*); 0.05 level (\*); 1-tailed test.

In (1), *attribute* refers to the component factor score according to the principal components method after varimax rotation; *weight* refers to the contribution that each factor makes to the total variance; and  $n$  = the number of factors extracted. The factor scores of the attributes of EO and IA, as well as their overall indices, are reported in Table 3. The factor analysis scores are saved as new variables for each factor in the final solution, using SPSS 12.0. Factor scores are produced by regression method, having mean of 0 and a variance equal to the squared multiple correlation between the estimated factor scores and the true factor values.

By contrast to the ambiguous findings for the EO index, the influence of the IA index on firm growth is indeed significant at the 0.1 level, and positive. This finding is consistent with the resource-based view of the firm (e.g. Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Teece et al, 1997), which suggests that the more the IA held, the faster will the firm grow. Guangdong Province, as one of two most prosperous regions in China (the other one being the Shanghai region), has a large regional economy which has been fairly well developed over more than two decades. Our results on IA suggest that the firm growth in this context should now be thought to depend, not only on tangible assets, but also on intangibles, which have been described as rare, heterogeneous and difficult to create, imitate or substitute (Wiklund, 1998).

This finding may help to clarify why some Chinese firms find it increasingly difficult to be successful by simply adopting the standards of OEM (Original Equipment Manufacturer), whilst otherwise maintaining the status quo. These firms typically lack intangible assets (and related capabilities), and therefore find it hard to compete when competition gets fierce, and profit margins are squeezed. We find that those who do go beyond a simplistic OEM mentality, and are willing to make efforts to build up brands and to establish a wider network, are able to expand their businesses further. Finally, although the IA index as a whole positively influences firm growth, it remains important to explore the individual roles which each attribute of it have played, in stimulating growth, or otherwise. Hence, our 'comprehensive' EO-IA-Growth model is examined next.

### **A Comprehensive EO-IA-Growth Model**

We now use the disaggregated attributes of both EO and IA, with the purpose of examining their individual effects on the growth of the Chinese small firm. In specifying the model, we focus on employment growth, thus adopting the same key metric as in the path-breaking work of Birch (1987, 1993). As it happens, this is also the key metric for policymakers. Thus, for our growth model, the dependent variable ( $Ge$ ) we use is the employment growth rate (in natural logarithms) computed from firm size data provided in two interviews during 2004 and 2006. The year 2006 was declared to be

Table 3: Statistics of EO and IA Attributes and Indices

	<i>Min.</i>	<i>Max.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Skewness</i>	<i>Std. Error</i>	<i>Kurtosis</i>	<i>Std. Error</i>
EO								
<i>Adventurousness</i>	-2.284	2.579	0.019	0.997	-0.123	0.267	0.108	0.529
<i>Innovativeness</i>	-1.590	2.203	-0.008	0.981	0.531	0.267	-0.593	0.529
<i>Proactiveness I</i>	-2.881	1.254	0.006	1.002	-1.671	0.267	2.122	0.529
<i>Proactiveness II</i>	-1.879	3.222	-0.008	1.011	0.350	0.267	0.383	0.529
<i>EOdex</i>	-0.913	0.641	0.003	0.336	-0.388	0.267	-0.168	0.529
<i>IA</i>	0	0	0	0	0	0	0	0
<i>Intellectual Property</i>	-1.188	4.141	-0.022	0.999	1.604	0.281	3.012	0.555
<i>Human Capital</i>	-2.420	1.514	0.024	0.982	-0.699	0.281	-0.165	0.555
<i>Reputation</i>	-1.781	1.761	-0.034	1.020	-0.232	0.281	-1.137	0.555
<i>Network</i>	-2.204	2.753	-0.061	0.982	0.402	0.281	0.115	0.555
<i>Technological Knowledge</i>	-1.938	2.097	0.000	0.967	-0.018	0.281	-0.587	0.555
<i>Enterprise Culture</i>	-3.099	0.990	-0.048	1.023	-1.500	0.281	1.509	0.555
<i>IAdex</i>	-0.722	0.809	-0.014	0.294	0.018	0.281	0.410	0.555

‘the year of the Chinese Brand’ by the Ministry of Commerce in China. To determine a linear relationship which uses the attributes of EO and IA to explain small firm growth, we specify size, age (in logs), and the indices of EO (*EOdex*) and IA (*IAdex*) as explanatory variables in a linear regression equation. To this is added a sample selection (i.e. ‘survival’) variable *IMR* (i.e. the ‘inverse Mill’s ratio’) for bias correction. The *IMR* is obtained from a binary probit model of survival,  $S = X\beta + u$ . The *IMR* is computed as  $\varphi(X\beta)/\Phi(X\beta)$  for  $S = 1$ , and the same expression minus unity for  $S = 0$ , where  $\varphi$  is the normal pdf and  $\Phi$  is the normal cdf. Here,  $S$  is a binary variable (‘survival’) which is equal to unity if the firm has survived until the second-stage interview and zero otherwise.  $X$  is a matrix containing the variables thought to affect the survival of Chinese private firms in the sample (viz. preceding growth rate, gearing, cash flow problems, customer orientation, size in terms of sales and of employment, and sector). White’s heteroskedastic robust standard errors are used. On this basis, a comprehensive model of how employment growth is determined by *EO* and *IA* is generated as follows:

$$Ge = \beta_0 + \beta_1 Size + \beta_2 Age + \varphi^T EOvec + \gamma^T IAvec + \beta_3 IMR + \omega \quad (2)$$

where *Size* is measured by the number of full time employees in 2004, *Age* is number of years from inception to 2004, *EOvec* is a vector of *EO* attributes with coefficients vector  $\varphi$ , *IAvec* is a vector of *IA* attributes with vector of coefficients  $\gamma$ . The superscript  $T$  denotes vector transposition. *IMR* (the inverse Mills ratio) is the sample selection (i.e. ‘survival’) bias variable and  $\omega$  is the error term. Estimation is by OLS using White’s (1980) heteroskedastic consistent standard errors. The estimates are reported in Table 4.

Considered overall, our model of Table 4 is highly satisfactory. The  $R^2$  is high for models of this sort (0.064) and even adjusted for degrees of freedom is high (0.41) for cross section models. The F-statistic for overall fit (2.76) is highly statistically significant (prob. value = 0.02). The *IMR* is also highly statistically significant (prob. value = 0.002) and works to correct for sample selection (“survival”) bias, due to exiting of firms. Here we find that Gibrat’s Law is strongly rejected (e.g. given the highly significant negative coefficient on *Size*), and Jovanovic’s entrepreneurial learning-by-doing theory has some support (the coefficient on *Age* is negative and significant at the level of 0.1), Some of the learning effect normally captured by the Jovanovic *Age* variable is picked up by the several *IA* attributes. This begins to present our comprehensive model as a viable alternative to both Gibrat (1931) and Jovanovic (1982). To put it alternatively, in our work, Gibrat is generalised; and Jovanovic is extended.

**Table 4: The Comprehensive Entrepreneurship-IA-Growth Model (n = 66)**

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob. Value</i>
<i>C</i>	0.509309	0.134192	3.795369	0.0011***
<i>Log(Size)</i>	-0.103250	0.035170	-2.935784	0.0082***
<i>Log(Age)</i>	-0.093811	0.053437	-1.755542	0.0945*
<i>Entrepreneurship</i>				
<i>Adventurousness</i>	0.016765	0.042967	0.390182	0.7005
<i>Innovativeness</i>	-0.060585	0.044927	-1.348513	0.1926
<i>Proactiveness I</i>	-0.037086	0.063192	-0.586877	0.5639
<i>Proactiveness II</i>	-0.057162	0.039361	-1.452254	0.1619
<i>IA</i>				
<i>Intellectual Property</i>	0.071864	0.051546	1.394171	0.1786
<i>Human Capital</i>	0.053340	0.049912	1.068695	0.2979
<i>Network</i>	0.124765	0.063221	1.973487	0.0624*
<i>Reputation</i>	-0.004762	0.051152	-0.093095	0.9268
<i>Technological Knowledge</i>	0.098752	0.044643	2.212063	0.0388**
<i>Enterprise Culture</i>	0.084543	0.035000	2.415510	0.0254**
<i>IMR</i>	-0.014194	0.005701	-2.489942	0.0217**
R-squared	0.641739	F-statistic	2.755781	
Adjusted R-squared	0.408869	Prob(F-statistic)	0.020329**	

*Note:* Significance at Levels: 1%(\*\*\*), 5%(\*\*), 10%(\*).

With regard to proactiveness II, which is defined in terms of defensive strategy and strategic planning, the passivity of the former and the dubious effectiveness of the latter, may actually cast a long shadow on growth. For new small firms, one of the successful tactics is to attack, rather than to defend, (Reid et al., 1993), unless such defensive strategies as have been adopted are well designed to have a combative or aggressive posture. Even this may possibly enhance the performance (e.g. profitability), yet may not necessarily achieve growth (Lumpkin and Dess, 1997). Finally, proactivity in strategic planning (which is very time- and materials-intensive) may itself absorb capabilities and resources that could have been better used for growth. This could impede expansion in the short term, even if it were helpful in the long run.

Based on the literature, on balance we generally expect a positive impact of EO on firm performance (Zahra, 1991; Zahra and Covin, 1995; Wiklund, 1998, 2004; Rauch, et al. 2004), with a few authors suggesting a negative impact of EO, in certain circumstances (e.g. Hart, 1992). However, our estimates suggest no significant impact of EO on firm growth at all, at least so far as the index of EO goes. To some extent, this is consistent with the views of Smart & Conant (1994) and Auger, et al. (2003), who have suggested there is no plausible, stable and consistent relationship between EO and firm outcomes.

The reasons for this are manifold. First, analytically – if not to judge just by modern business parlance - performance is much wider concept than growth (cf. O'Connor & Feng, 2005). Arguably, it is too simple to treat firm growth as the key variable for evaluating performance. Although entrepreneurship may enhance overall performance, as some have argued, it seems unnecessary that a similar effect should be observed in terms of employment growth. One might think that small firms with higher EO within their limits have it because of their entrepreneurial talents. Yet those with this type of human capital in abundance are extremely hard to retain. They may readily take the chance of setting up their own businesses (e.g. with some former colleagues, or new followers) when a good market opportunity emerges. Therefore, the impact of high EO may be more to encourage an increase in the number of new SMEs, rather than to increase the employment within existing SMEs. This may help to explain why Guangdong Province (where the primary source data used in our paper were collected), is the archetypical region in China for abundance of clusters of SMEs. Examples of such SME clusters include Dong Guan (the centre of electronics companies), Jie Yang (the centre of plastic goods manufacturers), and Fo Shan (the centre of sanitary ware factories).

In terms of the EO-Growth relationship, the coefficients of *adventurousness* and *proactiveness I* are highly insignificant. However, *innovativeness* and *proactiveness II* are related to employment growth rate in a negative way, but the prob. values (0.19 and 0.16, respectively) would not normally denote significance. Considering the sample size in this



study, these results may at least be indicative, even if they are not statistically significant. It may be that these Chinese firms compete on a different basis to innovation, and if so, they might prefer alternatives (e.g. imitation or emulation). Indeed, Nelson and Winter (1982) have argued that sometimes imitation can be more effective than innovation for the enhancement of a firm's performance; compare this to Jarrar & Smith (2014) who look at the role of innovation in developing entrepreneurial strategies, or Lev (2001) on the importance of innovation in creating intangibles. Guangdong Province has more of a reputation for being the 'world's factory' rather than for being its 'silicon valley'. Indeed, many firms in this region are said to excel by imitation. Our results suggest that heavier R&D emphasis, larger R&D expenditure, higher R&D intensity, and perhaps even greater use of E-commerce, may eventually lead to a *lower* headcount, as weighty R&D budgets are in a trade-off relationship against the wage bill.

Our finding is that the disaggregated attributes of EO in equation (3) (see Table 4) do not appear to influence small firm growth significantly. This may be because of aggregation across EO attributes, some of which have positive effects, while the rest have negative effects, on growth (i.e. a positive sign for *adventurousness* and a negative sign for the rest). While it remains equivocal whether the willingness of entrepreneurs can be transformed effectively and successfully into growth of the small firm, the evidence on intangible assets, our other growth determinant, is more affirmative.

Referring to Table 4, three attributes of IA (i.e. *network*, *technological knowledge*, *enterprise culture*) have a significant positive relationship with growth, and the other two attributes of IA (i.e. *intellectual property*, *human capital*) seem to exert at least some influence. However, *reputation* appears not to be statistically significant at any reasonable prob. level. It comes as no surprise that *network* is important for the growth of firms, as 'guan xi' speaks louder than anything else in Chinese business (Butler and Brown, 1994; Ding et al, 2015; Rickne, 2001). For a modernising developing country like China, this pervasive culture of 'guan xi' is so very powerful that, on many occasions, firms are vying for opportunities brought about by 'guan xi' (mainly with suppliers and buyers), rather than by professionalism or market-based competition (cf. Lu, 2012). Besides, successful high-growth firms also seem to arise from the use of advanced *technological knowledge*, typified by the entrepreneur's technological skill, his use of software and his running of the firm's website. As Drucker (1988) has argued, this sort of knowledge can be the main driving force behind lowering cost and enhancing management skills, thus leading to better firm outcomes. Further, although Eggers, et al.(1996) and Merrifield (2005) have asserted that an outmoded conception of the enterprise culture can actually check a firm's expansion, the modern healthy *enterprise culture* of Guangdong actually seems to boost growth. This resembles the findings of Nahm, et al.(2004) and Irani et al. (2004). Their results suggest that the more flexible is the firm (e.g. in adapting its

company regulations or codes to its environment) and the greater the influence that the owner-manager/entrepreneur has, the more likely is the firm to grow.

Another attribute of IA, *intellectual property*, also has a positive relation to growth, albeit slightly weak (prob. = 0.1786). This may be largely because of the widespread lack of observance of intellectual property rights in China, extending to a cavalier attitude towards patents, copyrights and trademarks. Given this unfavourable setting for IP protection, the potential of intellectual property for creating market power (e.g. by right of monopoly provision or exclusive production) cannot be transformed readily into 'competitive advantage' (Hall, 1992) resulting in an unpromising growth outlook. *Human capital* appears to have a positive influence on firm growth as well, yet it is not statistically significant. Training for top management, socializing activities, and enterprise stimulation schemes, whilst of potential significance, seem to have no impact on firm growth in our modelling. It may be that human capital would be more significantly related to growth were it defined in terms of founders' educational background, and relevant prior work experience, as in the study of Colombo and Grilli (2005). *Reputation*, surprisingly, is insignificant (at least in the strongest sense), which is in conflict with the findings of Roberts and Dowling (2002) and Galbreath (2005). Due to inevitable limitations of the data collected, the variable *Reputation* is defined in limited terms, by the number of advertisements, and the type of advertisement channels, neither of which really capture the idea of reputation as an intangible asset, related, for example, to goodwill: a quality which is intrinsically linked to the customer base of the business. Judged in this light, it is understandable that this IA attribute seems not to affect the growth outcome. It may be that the relationship between reputation and growth is positive and robust for different concepts of reputation (e.g. customer services, product services).

## 6. CONCLUSION

This paper is rooted in the so-called 'managerial' theories of the firm. Technically our research tasks were to: (a) use new fieldwork evidence to turn two abstract concepts, namely entrepreneurial orientation (EO) and intangible assets (IA), into operational measures; and (b) use our new measures in an econometric model of small firm growth. We believe our work to be novel in a number of respects. First, despite the well-known secrecy which is so characteristic of the Chinese business culture, we were able to obtain accurate first-hand firm-level evidence. This was made available through trusted 'gatekeepers' to the field, and involved interviewing Chinese entrepreneurs face-to-face. Second, predicated on these in-depth data, appropriate statistical techniques were utilized to make the abstract concepts of EO and IA operational for the first time. Our new measures were incorporated into a new specification of econometric growth model for the small firm.

The principal findings of this paper are therefore as follows. First, while EO and IA are defined as two abstract constructs at a higher level, they are capable of empirical implementation. Second, both EO and IA can be used to generalise and extend existing models of small firm growth. EO is found to be insignificant in its impact on growth, whilst IA was found to be a highly significant and positive in its impact on growth. Our paper suggests that, so far as our empirical evidence goes, little can be attributed to entrepreneurship, in terms of performance and growth, but rather that intangible assets are of key importance.

We have achieved our aim of measuring two complex and multidimensional concepts, entrepreneurship and intangible assets, and using these in econometric models of firm performance. Further, we have applied our model to empirical data in order to examine their influence over the growth of Chinese SMEs (cf. Jarrar & Smith, 2014; Rhodes et al, 2011; Schiff, 2013). A perhaps surprising result is that, contrary to the expectation that entrepreneurial skills would lead to enhanced business performance (cf. Bisbe & Malgüeño, 2015; Chenhall et al, 2011), in fact, entrepreneurship is shown to have little to no positive impact, though this is consistent with the findings of some previous authors (e.g. Smart & Conant, 1994; Auger et al., 2003).

On the other hand, the existence of intangible assets is shown to have a positive and significant impact upon performance, supporting earlier findings along these lines (e.g. Basu & Waymire, 2008). The policy in China, therefore, of encouraging the nation to acquire, realize and exploit their 'intangibles', appears to have been successful (cf. Wan et al, 2015). Specifically, the entrepreneur's network, technological knowledge and the enterprise culture are all positively and significantly associated with better performance. Further, there is a suggestion that the quality of intellectual property has some positive impact. An ability to build upon and exploit these intangibles can therefore help the owner-manager of a small entrepreneurial firm in China to achieve growth and enhanced performance.

## APPENDIX

### Definition of Variables Used in Main Text (*in alphabetic order*)

---

<i>Ads</i>	=1 if making advertisements, 0 otherwise
<i>Adsmedia</i>	The number of media types used for advertisements
<i>Advinet</i>	The major sources for advices at inception: small (1), medium (2), large (3)
<i>Age</i>	Number of years from inception to 2004
<i>CEO</i>	=1 if CEO and the board director is the same person, 0 otherwise
<i>Codes</i>	The flexibility of changing company codes: low (1), medium (2), high (3)
<i>Communi</i>	The number of communication methods
<i>CultureS</i>	=1 if enterprise culture is significantly influenced by entrepreneurs, 0 otherwise
<i>Defestgy</i>	The number of defensive strategies taken

---

<i>Delegate</i>	The level of control: (1) low, (2) medium, (3) strong
<i>Diploma</i>	The degree of higher education among employees: very low (1), low (2), medium (3), high (4), very high (5)
<i>Ebiz</i>	The willingness to do E-commerce: low (1), medium (2), high (3)
<i>ExInvest</i>	=1 if a firm has extra investment after the inception, 0 otherwise
<i>Ge</i>	Annual growth rate of employment between 2004 and 2006
<i>IMR</i>	The inverse Mill's ratio
<i>Investage</i>	The number of extra investment per year after the inception
<i>ISO</i>	The willingness to adopt international quality standard: low (1), medium (2), high (3)
<i>Knet</i>	The base of financial sources: very small (1), small (2), medium (3), large (4)
<i>Mmkt</i>	The Market extent: local (1), provincial (2), national (3), Asian (4), International (5)
<i>MSurvey</i>	=1 if a firm conducts the market survey, 0 otherwise
<i>NewPro</i>	The innovation of new products: very low (1), low (2), medium (3), high (4), very high (5)
<i>Npatent</i>	The number of patents held valid in a firm
<i>NStimula</i>	The number of stimulation schemes
<i>Patent</i>	=1 if a firm has any patent, 0 otherwise
<i>Psurvey</i>	The number of survey purposes
<i>RDbranch</i>	The establishment of R&D department: none (1), informal (2), formal (3)
<i>RDexpend</i>	The amount of money spent on R&D activities in 2004: very small (1), somehow below medium (2), medium (3), somehow above medium (4), very large (5)
<i>RDorien</i>	The degree of R&D orientation: low (1), medium (2), strong (3)
<i>RDprofit</i>	The ratio of R&D expenditure to profit: very low (1), somehow below medium (2), medium (3), somehow above medium (4), very high (5)
<i>Reputation</i>	The reputation compared to substitutes: below average (1), average (2), good (3)
<i>Gearing</i>	The degree of risk-taking: very low (1), low (2), medium (3), high (4), very high (5)
<i>Salary</i>	The salary level compared to the industry average: relatively low (1), somehow below average (2), average (3), somehow above average (4), relatively high (5)
<i>Size</i>	Number of full-time employees in 2004
<i>Slogan</i>	=1 if a firm has a company slogan, 0 otherwise
<i>Social</i>	The frequency of company socializing activities: very low (1), low (2), medium (3), high (4)
<i>Software</i>	The number of software that a firm employs
<i>StgyPlan</i>	=1 if a firm makes strategic development plans, 0 otherwise
<i>StockEx</i>	The ambition of being listed in the SME board of stock exchange: low (1), medium (2), strong (3)
<i>Substi</i>	=1 if superior to the substitutes, 0 otherwise
<i>Suppnet</i>	The base of suppliers: very small (1), small (2), medium (3), large (4), very large (5)
<i>Survival</i>	=1 survivor in 2006, 0 otherwise
<i>Tech</i>	The technological level: low (1), less advanced (2), moderate (3), moderately advanced (4), highly advanced (5)
<i>Technet</i>	The base of technological support: very small (1), small (2), medium (3), large (4), very large (5)
<i>Toptrain</i>	The frequency of top management training: very low (1), low (2), medium (3), high (4)
<i>Training</i>	=1 if a firm has training programs, 0 otherwise
<i>Website</i>	The willingness of having its own official website: low (1), medium (2), high (3), very high (4)
<i>Workcon</i>	The standard of working condition: poor (1), below average (2), average (3), above average (4), good (5)

---

### *Acknowledgments*

The authors should also like to express their grateful thanks to all the small business entrepreneurs in Guangdong province, who gave generously of their time during the fieldwork phase of the project. Earlier versions of this material have been presented to seminars at the University of St Andrews, and the University of Strathclyde, which was beneficial in formulating and focusing progressive versions of this work. An early draft of this work was presented to the British Accounting and Finance Association annual conference. Specific acknowledgment is made of the comments of Professors John Cullen, Felix FitzRoy, Oliver Kirschkamp, and Martin Tippet, which were helpful in putting this paper into its final form. Thanks also to colleagues at ESSCA School of Management, Angers and the University of Angers for hosting the researchers during the writing up of this paper. The authors remain responsible for any errors of omission or commission that this paper may yet contain.

### *Funding Details*

This research was supported by the Russell Trust, University of St Andrews; the Guangdong University of Foreign Studies; the Fondation Maison des Sciences de l'Homme; and the University of Strathclyde Glasgow.

### *References*

- Agbejule, A. (2011). Organizational culture and performance: the role of management accounting system. *Journal of Applied Accounting Research*, 12(1), 74-89. <http://dx.doi.org/10.1108/09675421111130621>
- Auger, P., Barnir, A., and Gallagher, J.M. (2003). Strategic orientation, competition, and Internet-based electronic commerce, *Information Technology and Management*, 4, 2-3, 139-164. <http://dx.doi.org/10.1023/A:1022942026706>
- Barney, J. (1991). Firm resources and sustained competitive advantage, *Journal of Management* 17, 99–120. <http://dx.doi.org/10.1177/014920639101700108>
- Basu, S. and Waymire, G., (2008). Has the importance of intangibles really grown. And if so, why, *Accounting & Business Research* 38(3), pp.171-190. <http://dx.doi.org/10.1080/00014788.2008.9663331>
- Baumol, W.J., (1996). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Business Venturing*, 11(1), pp.3-22. [http://dx.doi.org/10.1016/0883-9026\(94\)00014-X](http://dx.doi.org/10.1016/0883-9026(94)00014-X)
- Begley, T. M. (1995). Using founder status, age of firm, and company growth rate as the basis for distinguishing entrepreneurs from managers of small businesses, *Journal of Business Venturing*, 10, 249-263. [http://dx.doi.org/10.1016/0883-9026\(94\)00023-N](http://dx.doi.org/10.1016/0883-9026(94)00023-N)
- Birch, D. (1987). *Job Creation in America: How our smallest companies put the most people to work*, The Free Press: New York

- Bird, B. (1993). Demographic approaches to entrepreneurship: The role of experience and background. In J. A. Katz & R. H. Brockhaus Sr. (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, Vol. 1, pp. 11-48, Greenwich: JAI Press Inc.
- Bisbe, J., & Malagueño, R. (2015). How control systems influence product innovation processes: Examining the role of entrepreneurial orientation, *Accounting and Business Research*, 45(3), 356-86. <http://dx.doi.org/10.1080/00014788.2015.1009870>
- Blanchflower, D.G. and Oswald, A.J., (1998). What makes an entrepreneur? *Journal of Labor Economics*, 16(1), pp.26-60. <http://dx.doi.org/10.1086/209881>
- Colombo, M. G., & Grilli, L. (2005). Founders' human capital and the growth of new technology-based firms: A competence-based view. *Research Policy*, 34(6), 795-816. <http://dx.doi.org/10.1016/j.respol.2005.03.010>
- Brown, T. (1996) *Resource Orientation, Entrepreneurial Orientation and Growth: How the Perception of Resource Availability Affects Small Firm Growth*, Newark, NJ: Rutgers University.
- Busco, C., & Scapens, R.W. (2011). Management accounting systems and organisational culture: Interpreting their linkages and processes of change. *Qualitative Research in Accounting & Management*, 8(4), 320-357. <http://dx.doi.org/10.1108/11766091111189873>
- Butler, J.E. and Brown, B. (1994) The Impact of Inter-Organizational Relationships on Industrial Growth: The Case of the Handicraft Industry in Thailand, *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College.
- Chen, W.-H., Kang, M.-P. and Butler, B. (2019), How does top management team composition matter for continual growth? Reinvestigating Penrose's growth theory through the lens of upper echelons theory, *Management Decision*, Vol. 57 No. 1, pp. 41-70. <https://doi.org/10.1108/MD-02-2017-0147>
- Chenhall, R.H., Kallunki, J.P. and Silvola, H., (2011). Exploring the relationships between strategy, innovation, and management control systems: the roles of social networking, organic innovative culture, and formal controls. *Journal of Management Accounting Research*, 23(1), pp.99-128. <http://dx.doi.org/10.2308/jmar-10069>
- Collis, D.J. (1994) Research note: how valuable are organizational capabilities? *Strategic Management Journal*, 15, 143-152 (Special Issue). <http://dx.doi.org/10.1002/smj.4250150910>
- Converse, J.M. and Presser, S. (1986) *Survey Questions: Handcrafting the Standardized Questionnaire*, Series: Quantitative Applications in the Social Sciences, 63. Sage University Paper, Sage Publications: London.
- Cronbach, L.J.(1951) Coefficient alpha and the internal structure of tests. *Psychometrika*, 16: 297-334. <http://dx.doi.org/10.1007/BF02310555>
- Cuganesan, S. (2005). Intellectual capital in action and value creation: a case study of knowledge transformations in an innovation project. *Journal of Intellectual Capital* 6(3), 357-73. <http://dx.doi.org/10.1108/14691930510611102>

- Davidsson, P. (2015). Entrepreneurial opportunities and the entrepreneurship nexus: A re-conceptualization. *Journal of Business Venturing*, 30(5), pp.674-695. <http://dx.doi.org/10.1016/j.jbusvent.2015.01.002>
- Davison, J. (2009). Icon, iconography, iconology: Visual branding, banking and the case of the bowler hat. *Accounting, Auditing & Accountability Journal*, 22(6), 883-906. <http://dx.doi.org/10.1108/09513570910980454>
- Deb, P. & J. Wiklund (2017) The Effects of CEO Founder Status and Stock Ownership on Entrepreneurial Orientation in Small Firms, *Journal of Small Business Management*, 55:1, 32-55. <http://www.10.1111/jsbm.12231>
- De Waegenaere, A., Sansing, R. C., & Wielhouwer, J. L. (2012). Multinational taxation and R&D investments. *The Accounting Review*, 87(4), 1197-1217. <http://dx.doi.org/10.2308/accr-10281>
- Ding, S., Jia, C., Wilson, C., & Wu, Z. (2015). Political connections and agency conflicts: the roles of owner and manager political influence on executive compensation. *Review of Quantitative Finance and Accounting*, 45(2), 407-434. <http://dx.doi.org/10.1007/s11156-014-0441-9>
- Drucker, P. F. (1988) The Coming of New Organizations. *Harvard Business Review*, 66(1): 45–53.
- Dumay, J. (2016) A critical reflection on the future of intellectual capital: from reporting to disclosure, *Journal of Intellectual Capital*, Vol. 17 No. 1, pp. 168-184. <https://doi.org/10.1108/JIC-08-2015-0072>
- Dumitrescu, A.S. (2012). *Accounting and Management Information Systems*, 11(4), 545.
- Eggers, J.H., Leahy, K.T. and Churchill, N.C.(1996) Leadership, Management, and Culture in High-performance entrepreneurial companies, *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College.
- Eide, A.E., Moen, Ø., Madsen, T.K. and Azari, M.J. (2021), Growth aspirations in SMEs: managerial determinants and organizational outcomes, *Journal of Small Business and Enterprise Development*, Vol. 28 No. 4, pp. 640-665. <https://doi.org/10.1108/JSBED-09-2020-0332>
- Fowler, F.J. (1995) *Improving Survey Questions*, Applied Social Research Methods Series, 38, Sage Publications: London.
- Galbreath, J. (2005) Which resources matter the most to firm success? An exploratory study of resource-based theory, *Technovation* 25: 979-87. <http://dx.doi.org/10.1016/j.technovation.2004.02.008>
- Gibrat, R. (1931). *Les inégalités économiques* (Paris: Sirey).
- Grant, R.M. (1997) *Contemporary Strategy Analysis: Concepts, Techniques, Applications*, Blackwell Publishers; Oxford.
- Guilding, C., & Pike, R. (1990). Intangible marketing assets: a managerial accounting perspective. *Accounting and Business Research*, 21(81), 41-49. <http://dx.doi.org/10.1080/00014788.1990.9729402>

- Hall, R. (1992) The strategic analysis of intangible resources, *Strategic Management Journal* 13, 135–144. <http://dx.doi.org/10.1016/B978-0-7506-7088-3.50013-9>
- Hamel, G. and Prahalad, C.K. (1990) The core competence of the corporation. *Harvard Business Review* (May–June), 75–84.
- Hart, S.L. (1992) An integrative framework for strategy-making processes, *Acad. Manage. Rev.* 17 (2), 327–351. <http://dx.doi.org/10.2307/258775>
- Havnes, P.A. and Senneseth, K. (2001) A Panel Study of Firm Growth among SMEs in Networks, *Small Business Economics* 16: 293-302. <http://dx.doi.org/10.1023/A:1011100510643>
- Hofer, C. W., & Schendel, D. E. (1978). Strategy formulation: analysis and concepts. *St. Paul, MN: West Publishing.*
- Hossain, M.M., Alam, M., Islam, M.A., & Hecimovic, A., (2015) ‘Do stakeholders or social obligations drive corporate social and environmental responsibility reporting? Managerial views from a developing country’, *Qualitative Research in Accounting & Management*, Vol. 12 Iss: 3, pp.287 – 314. <http://dx.doi.org/10.1108/QRAM-10-2014-0061>
- Huang, C.C., Luther, R., Tayles, M., & Haniffa, R. (2013). Human capital disclosures in developing countries: figureheads and value creators. *Journal of Applied Accounting Research*, 14(2), 180-196. <http://dx.doi.org/10.1108/09675421311291919>
- Irani, Z., Beskee, A. and Love, P.E.D. (2004) Total quality management and corporate culture: constructs of organisational excellence, *Technovation*, August 24 (8), 643.
- Jarrar, N.S. and Smith, M., (2014). Innovation in entrepreneurial organisations: A platform for contemporary management change and a value creator. *The British Accounting Review*, 46(1), pp.60-76. <http://dx.doi.org/10.1016/j.bar.2013.07.001>
- Jovanovic, B. (1982) ‘Selection and the Evolution of Industry’, *Econometrica*, 50, 649–670. <http://dx.doi.org/10.2307/1912606>
- Kianto, A., Andreeva, T. and Pavlov, Y., 2013. The impact of intellectual capital management on company competitiveness and financial performance. *Knowledge Management Research & Practice*, 11(2), pp.112-122. <http://dx.doi.org/10.1057/kmrp.2013.9>
- Law, J. (2009) *A Dictionary of Business and Management*, 5<sup>th</sup> edn., Oxford University Press, Oxford.
- Lechner, C., Dowling, D. and Welpel, I. (2006) Firm Networks and the Firm Development: The Role of the Relational Mix, *Journal of Business Venturing* 21(4), 514-40. <http://dx.doi.org/10.1016/j.jbusvent.2005.02.004>
- Lev, B., (2001). Intangibles—management, measuring and reporting. *The Brookings Institution, Washington, DC.*
- Lin, W.-T., Chen, Y.-Y., Ahlstrom, D. and Wang, L.C. (2021), Does international expansion constrain growth? Business groups, internationalization, institutional distance, and the Penrose effect, *Multinational Business Review*, Vol. 29 No. 1, pp. 70-95. <https://doi.org/10.1108/MBR-11-2019-0163>



- Lumpkin, G.T. and Dess, G.G. (1997), Proactiveness versus Competitive Aggressiveness: Teasing Apart Key Dimensions of An Entrepreneurial Orientation, *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College.
- Lumpkin, G.T. and Dess, G.G. (2001) Linking two dimensions of entrepreneurial orientation to firm performance: the moderating role of environment and industry life cycle, *Journal of Business Venturing*, 16 (5), 429-31. [http://dx.doi.org/10.1016/S0883-9026\(00\)00048-3](http://dx.doi.org/10.1016/S0883-9026(00)00048-3)
- Merrifield, D.B. (2005) Obsolescent corporate cultures (One Point Of View), *Research-Technology Management*, 48 (2), 10-13. <http://dx.doi.org/10.1080/08956308.2005.11657299>
- Miller, D., and Toulouse, J.M. (1988) Strategy, structure, CEO personality and performance in small firms. *American Journal of Small Business*, Winter, 47-61.
- Moeller, K. (2010). Partner selection, partner behavior, and business network performance: An empirical study on German business networks. *Journal of Accounting & Organizational Change*, 6(1), 27-51. <http://dx.doi.org/10.1108/18325911011025687>
- Nahm, A.Y., Voderembse, M.A. and Koufteros, X.A. (2004) The impact of organizational culture on time-based manufacturing and performance, *Decision Sciences*, 35 (4), 579-608. <http://dx.doi.org/10.1111/j.1540-5915.2004.02660.x>
- Neck, H.M., Welbourne, T.M. and Meyer, G.D. (2000), Competing on knowledge: Young High-technology Initial Public Offerings Build for Growth, *Frontiers of Entrepreneurship Research*. Wellesley, MA, Babson College.
- Nelson, R.R. and Winter, S.G. (1982) *An Evolutionary Theory of Economic Change*, Harvard University Press, Cambridge, MA.
- Nielsen, C., & Montemari, M. (2012). The role of human resources in business model performance: the case of network-based companies. *Journal of Human Resource Costing & Accounting*, 16(2), 142-164. <http://dx.doi.org/10.1108/14013381211284254>
- Nunnally, J.C. (1978) *Psychometric Theory*, second ed, McGraw-Hill, New York.
- O'Connor, N.G. and Feng, E., (2005). Using the Balanced Scorecard to Manage Intangible Assets in A Sino Foreign Joint Venture. *Australian Accounting Review*, 15(36), pp.22-29. <http://dx.doi.org/10.1111/j.1835-2561.2005.tb00289.x>
- Penrose, E. (1959) *The Theory of the Growth of the Firm*, Oxford University Press.
- Peteraf, M. (1993) The cornerstones of competitive advantage: a resource-based view, *Strategic Management Journal* 14, 179–191. <http://dx.doi.org/10.1002/smj.4250140303>
- Rauch, A., Wiklund, J., Frese, M. & Lumpkin, G.T. (2009), Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future, *Entrepreneurship Theory and Practice*, 33(3), 761-787. <http://dx.doi.org/10.1111/j.1540-6520.2009.00308.x>
- Reid, G.C., Jacobsen L.R. and M. Andersen. (1993) *Profiles in Small Business: A Competitive Strategy Approach*. London; Routledge.

- Reid, G.C. (1993) *Small Business Enterprise: An Economic Analysis*. London; Routledge.
- Reid, G.C. and Jacobsen, L.R. (1988). *The Entrepreneurial Firm*, Aberdeen; Aberdeen University Press.
- Rhodes, J., Lok, P., Yang, S. and Xia, Y., (2011). The effects of organizational intangible factors on successful enterprise resource planning systems implementation and organizational performance: A China experience. *Asian Business & Management*, 10(2), pp.287-317. <http://dx.doi.org/10.1057/abm.2011.2>
- Rickne, A. (2001) Networking and Firm Performance, *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College.
- Roberts, P.W. and Dowling, G.R. (2002) Corporate reputation and sustained superior financial performance, *Strategic Management Journal* 23, 1077–1093. <http://dx.doi.org/10.1002/smj.274>
- Schiff, J. (2013) ‘The Wild, Wild East: applying management accounting practices in the People’s Republic of China’, *Management Accounting Quarterly*, 14(2), 19-23.
- Scott, J. and Marshall, G. (2005) Non-probability sampling. In *A Dictionary of Sociology*. Oxford University Press; Oxford.
- Shafer, W.E. and Simmons, R.S., 2011. Effects of organizational ethical culture on the ethical decisions of tax practitioners in mainland China. *Accounting, Auditing & Accountability Journal*, 24(5), pp.647-668. <http://dx.doi.org/10.1108/09513571111139139>
- Shane, S. and Venkataraman, S., (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, 25(1), pp.217-226. [http://dx.doi.org/10.1007/978-3-540-48543-8\\_8](http://dx.doi.org/10.1007/978-3-540-48543-8_8)
- Sharma, S. (1996) *Applied Multivariate Techniques*, Wiley; New York.
- Skinner, D.J., 2008. Accounting for intangibles—a critical review of policy recommendations. *Accounting and Business Research*, 38(3), pp.191-204. <http://dx.doi.org/10.1080/00014788.2008.9663332>
- Slater, M. (1980) The Managerial Limitation to the Growth of Firms, *Economic Journal* 90, 520–528. <http://dx.doi.org/10.2307/2231924>
- Smart, D.T. and Conant, J.S. (1994) Entrepreneurial orientation, distinctive marketing competencies and organizational performance, *Journal of Applied Business Research*, 10, 28–38. <http://dx.doi.org/10.19030/jabr.v10i3.5921>
- Souiraris, V., Peng, B., Zerbinati, S. and Shepherd, D. A., 2022. Specialists, generalists, or both? Founders’ multidimensional breadth of experience and entrepreneurial ventures’ fundraising at IPO. *Organization Science*, <https://doi.org/10.1287/orsc.2022.1581>
- Spender, J-C (1996) Making Knowledge the Basis of a Dynamic Theory of the Firm.’ *Strategic Management Journal*, 17(Winter Special Issue): 45–62. <http://dx.doi.org/10.1002/smj.4250171106>

- Tashakkori, A. and Teddlie, C. (1998) *Mixed Methodology: Combining Qualitative and Quantitative Approaches*, Applied Social Research Methods Series, Sage Publications: London, Vol.46.
- Teece, D.J., Pisano, G. and Shuen, A. (1997) Dynamic capabilities and strategic management, *Strategic Management Journal* 18, 509–533. <http://dx.doi.org/10.1093/0199248540.003.0013>
- Uliana, E., Macey, J., & Grant, P. (2005). Towards reporting human capital. *Meditari Accountancy Research*, 13(2), 167-188. <http://dx.doi.org/10.1108/10222529200500018>
- Wan, M., Lähtinen, K. and Toppinen, A., 2015. Strategic transformation in the value-added wood products companies: Case study evidence from China. *International Journal of Emerging Markets*, 10(2), pp.224-242.
- Wernerfelt, B. (1984) A resource-based view of the firm, *Strategic Management Journal* 5, 171–180. <http://dx.doi.org/10.1002/smj.4250050207>
- White, H (1980) A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica*, 48, 817-838. <http://dx.doi.org/10.2307/1912934>
- Wiklund, J. (1998) *Small Firm Growth and Performance*, Unpublished doctoral dissertation, Jonkoping International Business School, Jonkoping, Sweden.
- Rauch, A., Wiklund, J., Frese, M., & Lumpkin, G. T. (2004, June). Entrepreneurial orientation and business performance: Cumulative empirical evidence. In *23rd Babson College Entrepreneurship Research Conference*. Glasgow, UK.
- Yu Wong, Y., Maher, T.E., Evans, N.A. and Nicholson, J.D., (1998). Neo-confucianism: the bane of foreign firms in China. *Management Research News*, 21(1), pp.13-22. <http://dx.doi.org/10.1108/01409179810781329>
- Zahra, S. (1991). Predictors and financial outcomes of corporate entrepreneurship: An explorative study. *Journal of Business Venturing*, 6, 259-285. [http://dx.doi.org/10.1016/0883-9026\(91\)90019-A](http://dx.doi.org/10.1016/0883-9026(91)90019-A)
- Zahra, S., and Covin, J. (1995) Contextual Influence on the Corporate Entrepreneurship-Performance Relationship: A Longitudinal Analysis, *Journal of Business Venturing*, 10: 43–58. [http://dx.doi.org/10.1016/0883-9026\(94\)00004-E](http://dx.doi.org/10.1016/0883-9026(94)00004-E)