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Multinationality and the performance of IPOs

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Does multinationality affect the Initial Public Offering (IPO) performance of entrepreneurial firms? Theoretical arguments can be made for a positive effect of multinationality as well for a negative effect. We examine this question empirically by analysing IPO data for 240 UK firms. We find that multinationality has significant and positive effects on long-run IPO performance. This suggests that the market perceives entrepreneurial firms with multinational activities as possessing unique intangible assets that are indicative of future financial success. Factors affecting the IPO performance also differ systematically between firms with multinational operations and those without multinational operations. Stocks of intangible assets and the quality of the network significantly affect the performance of entrepreneurial IPO firms that ‘go global’. In contrast, domestic IPO firm performance is affected by offer size and underwriters’ perception of firm quality. The findings have important implications for entrepreneurial firms who are making decisions on ‘going global’ and ‘going public’.

Keywords: IPO; venture financing; multinationality; financial performance; entrepreneurship

JEL Classification: F23; G24; G14

1. Introduction

As markets continue to regionalize and globalize, entrepreneurial firms are responsible for a growing share of multinational activity (Klapper *et al.*, 2010). At the same time, relatively young and entrepreneurial companies are increasingly obtaining public listings on stock exchanges through an Initial Public Offering (IPO), resulting in a prodigious increase in both stock market capitalization and the number of listings (Huang, 1999; Megginson and Netter, 2001). These two business trends of ‘going global’ and ‘going public’ converge and partially explain the

growing number of entrepreneurial firms that run multinational operations at the time of public listing. What remains unclear is the effect of multinationality on the performance of newly public firms. Despite its relevance to the strategic decision making of entrepreneurial firms and venture capitalists, this research question appears to have fallen into a research gap between strategic management, finance, entrepreneurship, marketing and accounting.

Past research in strategy and international business provides strong theoretical reasons to expect that multinationality should be positively associated with firm performance. A driving argument is that

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international diversification allows firms to take advantage of the benefits of internalization (Buckley and Casson, 1976), to leverage their intangible assets (Morck and Yeung, 1991) and to source foreign knowledge and personnel (Oxelheim and Randoy, 2003; Cantwell and Mudambi, 2005). However, the empirical evidence is mixed and incomplete. A comprehensive literature survey (Hitt *et al.*, 2006) identifies a number of unanswered questions regarding both the underlying theory and the conflicting empirical evidence of the effect of multinationality on performance. In particular, past research has primarily examined firms that are large, well established and are in manufacturing sectors. Relatively little attention has been paid to smaller entrepreneurial firms. In this article, we identify entrepreneurial firms as young firms that are new to the publicly traded equity markets.

Other research, especially in finance and entrepreneurship, implies that the effects of multinationality may be different for newly public firms. The costs of global diversification can sometimes outweigh the benefits (Denis *et al.*, 2002), especially for new firms. It has been posited that established diversifying firms outperform new entrants in complex and turbulent environments, and that the pre-entry experience of the diversifiers is a key factor explaining this outcome (Bayus and Agarwal, 2007). Cross-border operations introduce complexities of communications and monitoring (Casson, 1995) that may cause inexperienced entrepreneurial firms to underperform. IPO firms going global may suffer from two sets of liabilities – the liability of newness and the liability of foreignness – and this challenges their ability to survive (Mudambi and Zahra, 2007).

Does multinationality affect the performance of newly public firms? To answer this question, we take an interdisciplinary approach. We draw on theory and evidence from strategy, finance, accounting, marketing and entrepreneurship. We test the relationship between multinationality and IPO performance by analysing data on newly public firms in the UK, and our event study methodology incorporates a temporal dimension, in line with the recommendations of key studies on multinationality (Hitt *et al.*, 2006). After controlling for firm quality, we find that multinationality has significant and positive effects on long-run IPO performance. Young, entrepreneurial firms that choose to operate as multinationals exhibit positive returns to internationalization.

After further analysis, we find that the factors affecting multinational IPO performance differ systematically from those affecting domestic IPO performance. Firms with high intangibles and good connections benefit from multinationality. For firms

with a large business opportunity and low costs of going public, staying domestic is beneficial. These results suggest that firms self-select into the two categories based on their resources and capabilities. Multinational firms seem to be rewarded for their options value, while domestic firms appear to be rewarded for their cash flow value.

This article is organized as follows. The following sections describe the theoretical development, the research method and data, the estimation and the results. The final section offers concluding comments regarding the implications of the research for managers and researchers.

II. Theory Development

The theory of finance is concerned in the main with understanding the various ways by which businesses and individuals raise money (Jenkinson and Ljungqvist, 1996). The principal focus of the field of entrepreneurship is the understanding of opportunity recognition (Casson, 2003), either through discovery or creation (Alvarez and Barney, 2007). Hence the focus of international entrepreneurial finance is the understanding of the linkages between the opportunities that span national borders and the raising of capital. Internationalization and multinational operation expose the firm to a wider range of novel opportunities. On this basis, we posit that the study of the effect of multinationality on the performance of IPOs falls squarely within the gamut of international entrepreneurial finance.

In extensive past research, multinationality has been viewed as the degree of cross-border geographic diversification of a firm. International business theory has identified the advantages and disadvantages generated by multinational operations. Advantages include: access to country-specific resources; opportunities to exploit market imperfections by internalizing advantages; arbitrage opportunities for cross-subsidization and price discrimination and economies of scale and scope (Buckley and Casson, 1976; Dunning, 1988). Another stream of research has emphasized the value enhancing potential of improved leveraging of the tangible and intangible resources of the firm. These include intangibles, particularly those related to knowledge, research and development (R&D) and marketing (Morck and Yeung, 1991; Lu and Beamish, 2004; Mudambi, 2008).

Some have expressed doubts regarding the accepted theoretical rationale for the relationship between multinationality and performance

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Multinationality and IPO performance

3

(Hennart, 2007). Others have highlighted continuing difficulties of the internationalization process. A comprehensive literature survey (Hitt *et al.*, 2006) provided multiple insights into the complexities and conflicts of the underlying theory and the empirical evidence. In general, many of these theoretical concerns stem from the difficulties of measuring the true extent of multinationality of large, complex multinational firms. By definition, these concerns are alleviated in the case of small, entrepreneurial firms that are at a very early stage of multinational operation.

Several empirical studies generally support the notion that a firm's performance improves with international expansion (Doukas and Travlos, 1988), with multinational activity improving the firm's rate of return (Grant, 1987), firm value (Bodnar and Weintrop, 1997) and survival prospects (Shaver *et al.*, 1997). However, the overall evidence is clearly mixed. Bodnar, *et al.* (2003) found a 1.4% value premium to corporate international diversification, while some have reported a negative effect (Geringer *et al.*, 2000; Denis *et al.*, 2002) and others have found an inverted U-shaped relationship (Geringer *et al.*, 1989; Hitt *et al.*, 1997).

The assumption of a simple and monotonic positive relationship has been increasingly questioned (Contractor *et al.*, 2003; Lu and Beamish, 2004). Evidence of an S-shaped relationship has been provided, in which internationalization and performance is negative at very low and very high levels of internationalization while positive in the intermediate range (Contractor *et al.*, 2003; Lu and Beamish, 2004). The current consensus is that multinationality is positively associated with firm performance, but this relationship is highly time and context dependent, with a continuing need for the consideration of performance measures other than traditional accounting-based measures (Hitt *et al.*, 2006). Firms 'go global' or internationalize for many reasons, and this heterogeneity of firm motivations for internationalization provides another means of reconciling the conflicting results reported in the literature. It is possible and desirable to distinguish between firms that *have to* internationalize and those that *want to* do so. The first category consists of firms that have been pushed to internationalize by declining rates of return in their home markets caused by factors such as institutional constraints or market saturation (Inkpen, 2000). The second category consists of firms that see internationalization as an opportunity for implementing value chain innovations to achieve higher rates of return (Pantzalis, 2001). As the benefit-cost analysis of internationalization is likely

to be very different for these two categories of firms, this could explain some differences in performance.

Although the age and size of the firms has been taken into account in many of these studies of multinationality effects, past research has generally focused on the performance of established firms, most of which are large and in the manufacturing sector (e.g. Grant, 1987; Lu and Beamish, 2004). The multinationality of newly public firms has been given little attention, despite the fact that there are reasons to believe that the effects of multinationality on the performance will be different for younger and smaller firms. The research question we address in this article is: *Does multinationality affect IPO performance?* Past research provides a few indications that multinationality is an important positive factor in IPO performance. The main source of value from multinationality, namely the leveraging of intangible knowledge and market opportunities (Morck and Yeung, 1991), seems to apply to newly public firms as it does to established firms. In addition, the stock market values the domestic and foreign components of firms at different rates (Saudagaran, 1993). Multinational operations have also been shown to exhibit greater growth potential (Bodnar and Weintrop, 1997) and governance benefits (Oxelheim and Randoy, 2003).

In contrast, there are several reasons for expecting that the effects of multinationality may be different for newly public firms. First, newly public firms particularly in the US and UK tend to be entrepreneurial firms at a fairly early stage of development (Jenkinson and Ljungqvist, 1996). This implies that domestic market saturation is unlikely to be a strong factor in undertaking foreign operations. Second, survival rather than value creation is the main focus of such firms, since the probability of failure is highest in the early years of a business's life (Caves, 1998). New firms may suffer from a 'liability of newness' (Stinchcombe, 1965) that they overcome with experience, so that hazard declines with age. Third, for small, young and inexperienced firms, multinationality introduces complexities that strain communications and monitoring systems (Casson, 1995).

For these reasons, multinationality for newly public firms may be a bane, not a blessing. Indeed, this line of reasoning reflects the theme in other research that the costs of global diversification can sometimes outweigh the benefits (Denis *et al.*, 2002; Hitt *et al.*, 2006). This suggests that young, entrepreneurial firms that undertake multinational operations prior to IPO have compelling strategic reasons for doing so. In other words, they are likely to go global because they want to. The question must ultimately

be tested and resolved empirically in a representative sample of IPO firms.

Prior research on entrepreneurial firms and IPOs has explored a range of other strategic and organizational decisions on performance, including the effects of firm size, recent performance, market sentiment, and operational and financial decisions (Goergen *et al.*, 2007). Research has also compared the performance of IPO firms to that of established firms. IPO firms tend to outperform market benchmarks in their first few days of trading, but over longer periods, IPOs tend to underperform market benchmarks (Ritter, 1991). To explain this performance difference, researchers have proposed a number of theories, such as over-optimism by investors and the winner's curse (Rock, 1986), underwriter price supports (Ruud, 1993), strategic behaviour by investment banks (Beatty and Ritter, 1986) and multiple agency conflicts (Arrow, 1984).

Just as there are two categories of firms that internationalize, research in entrepreneurship and finance has uncovered two main categories of IPO firms (Jenkinson and Ljungqvist, 1996), based on the many reasons for going public (Casson, 1995). The first category consists of entrepreneurial firms that are emerging out of their development stage and have a successful business model to sell to investors (Casson, 2003). Such firms go public because they *want to*, in order to seek to increase the liquidity of the firm's assets through expanded trading opportunities, or to gain legitimacy and establish the value of the firm. This category predominates in the US and the UK. The second category consists of mature and often family-controlled firms that are capital-constrained with respect to their expansion plans. These firms go public because they *have to*, i.e. they need to offset asymmetric information problems in order to gain access to equity markets. This category is more common in continental Europe.

In recognition of this issue of differences across firm categories, we examine the performance of a population of young, entrepreneurial firms. All the firms fall firmly in the category of firms that *want to* go public. Within this population, some have chosen to undertake multinational operations, and some have chosen not to. We are able to contrast the performance of firms that internationalize to those that focus on purely domestic operations. This approach is particularly conservative with regard to the positive effects of multinationality, since in addition to all the costs borne by established firms, young firms also bear the costs associated with the pure liability of newness; the liability of foreignness may also be particularly severe for newly public firms (Mudambi and Zahra, 2007). Given past research and

the underlying theories of internationalization, our central research hypothesis is:

For young entrepreneurial firms, higher levels of multinationality at the time of IPO are associated with improved levels of IPO performance.

III. Research Method

To test the hypothesis of an association between increasing levels of multinationality and IPO performance, we first define and estimate IPO returns, and then relate these IPO returns to multinational activity. In doing so, we control for the factors that past research has shown to affect IPO performance. One of the most important factors is firm quality. Controls for firm quality are crucial, since it is likely that better quality firms will exhibit higher levels of both multinationality and performance. Since at the time of IPO, the level of multinationality is predetermined, the controls for firm quality allow us to isolate and test the effect of multinationality on firm performance. Morck and Yeung (1991) established the connection between firm quality and high levels of intangibles. Firms with high levels of intangibles were better able to derive value from multinational operations. Secondly, in the finance literature, Fang (2005) established that higher quality IPO firms tend to be taken public by higher quality underwriters. Underwriter reputation is therefore accepted as a strong control for IPO firm quality. By using measures for the level of intangibles and underwriter reputation, we can control for firm quality.

After examining the effect of multinationality on IPO performance for the sample as a whole, we undertake a split sample analysis to dig deeper into the differences between the firms that choose to go multinational and the firms that choose to remain domestic. Numerous other factors affecting IPO performance have been identified in the literature. We analyse the effects of these factors on IPO performance in the two sub-samples.

Estimating IPO returns

Following the standard approach in past research, we define short-run IPO returns to be the market adjusted abnormal returns at the close of the first day of trading (*MAAR0*) (Aggarwal *et al.*, 1993). These returns are computed relative to a market index. Since the IPO firms are generally relatively small, we use the Hoare Govett Smaller Companies

Multinationality and IPO performance

5

(HGSC) index as the appropriate benchmark. It is composed of 1528 companies and makes up about 9% of the Exchange's total market capitalization. The HGSC is the standard smaller companies' index for the London Stock Exchange.

The total return for firm '*i*' at the end of the first day's trading is $R_{i1} = (P_{i1}/P_{i0})$, where P_{i0} is the IPO offer price and P_{i1} is the firm's stock price at the end of the first day's trading. The return on the market index for the same period is $R_{m1} = (I_{i1}/I_{i0})$, where I_{i0} is the value of the market index at the beginning of the offer day of firm '*i*' and I_{i1} is the value of the index at the close of trading on the offer day. Using these two returns, $MAAR_0$ for firm '*i*' is

$$MAAR_{0i} = \{[(1 + R_{i1})/(1 + R_{m1})] - 1\} \quad (1)$$

In the literature, the 'long run' for IPO returns has ranged from 24 months to 60 months (Khurshed and Mudambi, 2002). However, the vast majority of studies define long-run returns to be the market adjusted buy-and-hold abnormal returns in the after-market for a period of 36 months following the first month of trading ($MAAR_{36}$). Buy-and-hold returns are preferred on the grounds of consistency and lack of bias (Conrad and Kaul, 1993). Following standard practice, we eliminate the first month of trading, and use the stock price on the last trading day of each month. Dividend payments and rights and scrip issues are incorporated. Drawing on Ritter (1991), we measure the long-run returns ($MAAR_{36}$) as

$$MAAR_{36} = \sum_{t=2, t=37} [\ln(P_{it}/P_{it-1}) - \ln(I_{mt}/I_{mt-1})] \quad (2)$$

This takes into account the change in the firm's stock price relative to the market index.

Multinationality

Multinational activity is defined as the operational presence in multiple countries (UNCTAD, 1997). Multinational activity involves the internalization of international market transactions (Buckley and Casson, 1976) and is usually interpreted as requiring a presence through operating subsidiaries. This is in contrast to exports, licensing or franchising activities in more than one country. The firm's level of multinational activity is determined by the geographical scope of its subsidiaries at the time of its IPO. In our sample, the IPO firms had equity control of their subsidiaries.

The geographical areas considered are the UK, mainland Europe, North America, South America, Asia, Australia and Africa. Each firm is automatically assigned an index score of 1, since all have UK operations. Its score increases by 1 for every other area in which it has operations. If it has operations in

one area outside the UK, it receives a score of 2; while if it has operations in two areas outside the UK, it receives a score of 3 and so on. The maximum value of the index is 7. This measure of multinationality was the best utilization of the data available from the IPO prospectuses, in the sense that it makes the best comparison with over two decades of previous studies of the multinationality-performance relationship in both finance and management (e.g. Doukas and Travlos, 1988; Pantzalis, 2001; Denis *et al.*, 2002; Kim *et al.*, 2004; Lu and Beamish, 2004; Hitt *et al.*, 2006).

To analyse the effect of multinational activity on IPO performance, we estimate the following relationship:

$$MAAR_{ij}(j) = f(\text{multinational activity, control variables}) \quad (3)$$

We estimate the effects of multinationality on short-run performance, defined as the market-adjusted abnormal returns at close of the first day of trading (when $j=0$), and on long-run performance, defined as 36 months following the first month of trading (when $j=36$). We recognize that our results are conditional on the IPO decision having been made. In other words, within the sub-population of firms that have decided to go public, we are comparing those that had pre-existing multinational operations with those that did not (Fig. 1). This conditionality is a standard aspect of event study analysis: the results obtained are conditional on the event having taken place. The event study methodology is well established in the IPO literature, beginning with the pioneering study of Ritter (1984), and continuing to recent studies (e.g. Wang *et al.*, 2002; Fan *et al.*, 2007; Lin and Hsu, 2009).

Robustness and control variables

A key concern for our study is whether our results are robust to the level of firm quality. Firm quality could be a common underlying cause for both multinationality and IPO performance. In other words, firms with prior multinational operations at the time of IPO could be of systematically higher quality than firms whose operations are entirely domestic. We address this concern by using alternative measures of firm quality that have been identified as being strongly related to firm valuation, and hence likely to drive stock price performance. We use the established measures of the level of firm intangibles (Morck and Yeung, 1991; Lev, 2001; Mudambi, 2008) and underwriter quality (Fang, 2005). Sufficiently strong controls for firm quality are

Conditionality of results

Fig. 1. Conditionality of results

likely to ensure that we obtain an ‘apples to apples’ comparison.

Product line diversification is another important differentiating factor to consider (Geringer *et al.*, 1989). Multinationality has been found to have strong positive effects for highly product diversified firms, but negative effects for nondiversified firms. We introduce product line diversification by considering the number of industry codes in which the firm reports operations. We take into account nonlinear effects as well as interaction effects between multinationality and product line diversification (Hitt *et al.*, 1997).

We control for the factors that past research has identified as affecting IPO performance, as well as factors recognized as affecting the performance of more established firms. This enables us to relate our findings to the extant literature. Not all of these control variables are purely exogenous. However, given the sequential nature of the IPO process, all of them are pre-determined at the time of the IPO. Within the event study methodology, there is no systematic time dimension, so the concerns of autocorrelated errors do not arise.

Since characteristics of the firm before and at the IPO have been found to have an influence on post-IPO performance (Goergen *et al.*, 2007), we take into account the firm’s pre-IPO reported profits and the cost of flotation. The cost variable is based on the notion that firms judged to be weaker by investment bankers incur higher costs in going public (Beatty and Ritter, 1986). We use short-run performance as an explanatory variable for long-run performance (Rajan and Servaes, 1997). Other variables include measures for size, age and underwriter reputation (Carter *et al.*, 1998). We capture the size of the firm

by its reported assets, and measure the size of the IPO by the amount of funds raised. We introduce age by using the duration of its pre-IPO operations, i.e. the number of days between the date of registration and the first day of trading. We use a measure of underwriter size as a proxy for the reputation of the IPO underwriters. Several London investment bankers indicated that this is the best measure of reputation in this industry. Carter and Manaster (1990) adopt a similar methodology.

Asymmetric information problems are endemic to firm organization (Jensen and Meckling, 1976). These are particularly acute in the case of IPOs, since there is no stock price history encapsulating publicly available information (Jenkinson and Ljungqvist, 1996). These effects can be summarized under the headings of adverse selection (agents attempting to pass themselves off as better endowed than they are) and moral hazard (agents using the screen of asymmetric information to shirk). Both adverse selection and moral hazard are generally addressed as ‘agency problems’ in the finance literature (Leland and Pyle, 1977).

We account for asymmetric information and other agency problems by using the percentage of the equity of the firm issued at the IPO. The rationale (Mello and Parsons, 1992) is that owners of worse firms have an incentive to sell a greater proportion of stock to the public (adverse selection). Further, the smaller the proportion that is held by its owners, the less their incentive alignment with shareholders and the lower the incentive for them to put in a maximal level of effort (moral hazard) (Mudambi and Nicosia, 1998). The more the IPO is used as an exit strategy for the original investors, the more severe the agency problems become. However, we cannot disentangle

Table 1. Variables used in the analysis

Variable	Definition
<i>MAAR36</i>	Market adjusted long run buy-and-hold abnormal returns for 36 months following the first month of trading, including dividend payments and rights and scrip issues, using the stock price on the last trading day of each month. Excludes the first month of trading
<i>MAAR0</i>	Market adjusted abnormal returns at close of the first day of trading relative to the HGSC index
<i>YR<i>i</i></i>	Year dummy for IPO occurring in year ' <i>i</i> '
<i>GSCOPE</i>	Number of regions in which the firm has operating subsidiaries at the time of IPO. Regions are: The UK, other Europe, North America, South America, Asia, Australasia and Africa. ^a If <i>GSCOPE</i> = 1, the firm has only home (UK). If <i>GSCOPE</i> = 2, the firm has multinational operations in one other region, up to a max of 7
<i>DIVERS</i>	Number of two-digit industries in which the IPO firm has lines of business
<i>PROFLOAT</i>	Average pre-tax profits/losses for the 3 years before the IPO (£ million)
<i>COST</i>	Total direct costs, as a percentage of funds raised, incurred for the listing. Includes underwriting fees, legal expenses, accountancy and audit fees
<i>INTANG</i>	Intangibles as a percentage of net firm assets in the year before listing (%)
<i>FUNDS</i>	The amount of funds raised in the IPO (£ million)
<i>ASSETFLOAT</i>	Net assets of the firm in the year before listing (£ million)
<i>DURATION</i>	Difference between the date of registration of the company and the date of listing ('000 days)
<i>REPUNDER</i>	Reputation of the lead underwriter, measured as market share by value, expressed as a percentage of the underwriting market in the year of the issue
<i>EQUISSUE</i>	Percentage of the equity of the firm issued at the IPO
<i>ID1</i>	<i>Industry dummy</i> – Extraction of minerals, mineral products and ores and chemicals ^b
<i>ID2</i>	<i>Industry dummy</i> – Metal goods, engineering and vehicle industries ^b
<i>ID3</i>	<i>Industry dummy</i> – Other manufacturing industries ^b
<i>ID4</i>	<i>Industry dummy</i> – Construction ^b
<i>ID5</i>	<i>Industry dummy</i> – Distribution including hotels and catering ^b
<i>ID6</i>	<i>Industry dummy</i> – Transport and communication ^b
<i>ID7</i>	<i>Industry dummy</i> – Banking, finance, insurance, business services and leasing ^b

Notes: ^aRegions are based on the reporting requirements for IPO prospectuses in the UK.

^bSource: London Stock Exchange.

the effects of adverse selection and moral hazard. We also control for the so-called 'hot-issue periods' (Ritter, 1984) by introducing time dummies. We take account of industry-specific effects by introducing industry dummies. These dummies are based on the two-digit industry categories used by the London Stock Exchange.

Table 1 provides full details of all variables used. At the time of IPO, the level of multinationality is pre-determined. By using the controls for firm quality and other factors affecting IPO performance, we are able to test the effect of multinationality on firm performance.

Data

We identified the target population of IPOs using the London Share Price Database (LSPD). The sample comprises 240 IPOs of noninvestment trust companies floated on the UK Official List from January 1991 to June 1995, with returns tracked for each firm for 36 months. Therefore the returns period extends

to June 1998. There were 252 noninvestment trust IPOs during this period, so that the sample coverage is over 95%. The 12 excluded IPOs had incomplete data entries in this database, as well as in other publications. Table 2 provides details on the sample coverage.

Initial trading prices and initial returns were determined using Datastream's UK Equity Database and monthly returns from the LSPD. Information concerning the particulars of each offering, including multinationality and normalizing factor data, was obtained from five secondary sources (*The Extel Book of Takeovers, New Issues and Offers; KPMG New Issue Statistics; Extel Company Research; The London Stock Exchange Yearbooks and The Hamilton Scott Smaller Companies Guide*). The multiplicity of the sources was useful in verifying data entries and minimizing the number of gaps in the data, resulting in 194 complete data records. Firms with missing data were not statistically significantly different from firms with complete data, along six dimensions. Several London investment bankers examined our data and concluded that the firms

Table 2. IPOs on the London main market: year-by-year and industry sample coverage

	Total IPOs	Sample	Sample coverage (%)
Year			
1991	15	12	80.0
1992	26	25	96.2
1993	66	64	97.0
1994	119	114	95.8
1995	26	25	96.2
Total	252	240	—
Mean	51.8	48.0	95.2
Industry			
ID1	18	16	88.9
ID2	24	21	87.5
ID3	56	55	98.2
ID4	55	54	98.2
ID5	20	18	90.0
ID6	60	58	96.7
ID7	19	18	94.7
Total	252	240	—
Mean	36.0	34.3	95.2

with missing data were a random sub-set of the population of IPO firms.

Table 3 provides summary statistics with regard to all variables used in this study. These statistics are reported separately for all IPO firms, multinational firms and domestic firms. As noted above, multinational IPO firms are those firms that report subsidiary operations in at least one region other than the UK. Domestic IPO firms are those that report operations wholly within the UK. Multinationals and domestic IPO firms differ only slightly in their unconditional returns in the long run. It is interesting to note that the multinational firms in the sample are actually smaller, on average, than domestic firms in terms of assets. However, they seem to raise a slightly higher level of IPO funds and their cost of flotation is slightly lower. The domestic firms are also older on average. Both types of firm issue roughly the same percentage of their equity at the IPO. Thus, the effects of multinationality that appear in this study cannot be attributed to size, operational experience or agency effects.

IV. Estimation and Results

Our research objective is to test the hypothesis: *Increasing levels of multinationality at the time of IPO are associated with improved levels of IPO performance.* To do this, we relate IPO short-run

and long-run returns to multinational activity, and control for factors that affect IPO performance.

Estimation

To obtain base-line estimates, we used Ordinary Least Squares (OLS) to estimate Equation 3 for all IPO firms. Since the firms varied considerably in terms of size, heteroscedasticity was a very real concern. The Breusch–Pagan test strongly rejected the null hypothesis of homoscedasticity. We dealt with this issue by using White's heteroscedasticity-consistent variance-covariance matrix in estimating the 't' statistics.

Tables 4 and 5 present estimates of the short-run and long-run returns. We not only focus on the statistically significant effects of the independent variables, but also highlight coefficients that have large magnitudes. We present the base-line estimates for all firms along with separate estimates for multinational and domestic IPO firms. The presented specifications are the result of an exhaustive set of specification tests (results available from the authors). Consistent with the findings of Hitt *et al.* (1997), we find that a specification with nonlinear effects was best for long-run returns. The results are remarkably robust to changes in specification. The leverage effects of outliers from the residual method (Belsley *et al.*, 1980) are not substantial, so the results are robust to dropping observations for larger firms, very high return firms and so on. The results for 12- and 24-month returns are qualitatively consistent. In the context of the studies of IPO returns, the fit of all estimations are very good. The fit for multinational firms is particularly good.

Multinationality and IPO short run returns

Neither multinationality nor product line diversification has a significant effect on short-run returns, as indicated in Table 4. However, specification tests could not reject the exclusion of nonlinear terms in multinationality (*GSCOPE*) and product line diversification (*DIVERS*), as well as an interaction between the two. Perhaps more importantly, we note that the overall fit of the base-line estimates for short-run returns is worse than the fit for the multinational and domestic sub-samples. The Chow test statistic is significant, indicating that the hypothesis of equal parameter values for domestic and multinational firms can be rejected. This implies that the estimates for all firms are a composition of two separate underlying relationships. Since the estimates based on disaggregating the sample into

Multinationality and IPO performance

9

Table 3. Summary statistics

Variable	All firms $N = 194$		Multinationals $N = 92$		Domestic firms $N = 102$	
	Mean	SD	Mean	SD	Mean	SD
<i>MAAR36</i>	-0.183	0.738	-0.178	0.806	-0.186	0.676
<i>MAAR0</i>	0.095	0.177	0.112	0.198	0.080	0.154
<i>GSCOPE</i>	1.887	1.237	2.870	1.179	1	0.000
<i>DIVERS</i>	1.619	0.875	1.674	0.866	1.569	0.884
<i>PROFLOAT</i>	2.760	8.643	3.081	9.700	2.470	7.602
<i>COST</i>	0.059	0.038	0.056	0.034	0.062	0.042
<i>INTANG</i>	9.682	4.127	12.624	6.321	6.972	2.965
<i>FUNDS</i>	38.766	76.985	42.581	81.673	35.325	72.734
<i>ASSETFLOAT</i>	17.099	51.590	13.566	53.886	20.286	49.477
<i>DURATION</i>	2.601	3.904	2.183	3.055	2.977	4.518
<i>REPUNDER</i>	0.045	0.065	0.043	0.056	0.048	0.073
<i>EQUISSUE</i>	0.460	0.181	0.456	0.169	0.463	0.193

Table 4. Estimating short-run returns

Regressor	Coefficient ('t' statistic) ^a		
	All firms	Multinational firms	Domestic firms
Constant	5.00 (0.86)	-2.14 (0.19)	15.90 (2.87)***
<i>GSCOPE</i>	1.11 (1.15)	1.98 (1.15)	-
<i>DIVERS</i>	-1.23 (1.07)	-1.56 (0.75)	-0.89 (0.67)
<i>PROFLOAT</i>	-0.04 (0.37)	0.24 (1.67)*	0.17 (0.96)
<i>COST</i>	5.47 (0.19)	2.94 (0.05)	-5.52 (0.17)
<i>INTANG</i>	0.671 (0.91)	0.652 (1.42)	0.644 (0.82)
<i>FUNDS</i>	0.02 (1.58)	-0.003 (0.12)	0.05 (2.31)**
<i>ASSETFLOAT</i>	-0.02 (1.01)	-0.08 (2.44)**	-0.02 (0.61)
<i>DURATION</i>	0.40 (1.79)*	-0.20 (0.59)	-0.53 (1.90)*
<i>REPUNDER</i>	-30.94 (1.36)	84.88 (2.22)**	-7.48 (0.33)
<i>EQUISSUE</i>	-6.75 (1.28)	-4.49 (0.43)	-12.61 (1.89)*
<i>YR92</i>	6.11 (1.06)	15.86 (1.87)*	-1.78 (0.58)
<i>YR93</i>	15.13 (1.97)*	25.30 (2.11)**	7.70 (1.37)
<i>YR94</i>	4.78 (0.92)	12.15 (1.61)	-1.48 (0.50)
<i>YR95</i>	6.51 (1.13)	13.14 (1.56)	-
<i>ID1</i>	0.64 (0.11)	4.57 (0.64)	-21.88 (2.90)***
<i>ID2</i>	0.50 (0.14)	-3.46 (0.54)	1.36 (0.33)
<i>ID3</i>	1.45 (0.45)	-1.74 (0.33)	-0.03 (0.01)
<i>ID4</i>	0.96 (0.36)	0.58 (0.12)	-0.26 (0.09)
<i>ID5</i>	-4.97 (1.86)*	-4.36 (0.83)	-12.77 (3.37)***
<i>ID6</i>	5.78 (1.21)	1.77 (0.23)	-
<i>ID7</i>	0.52 (0.15)	-8.99 (1.46)	-
Diagnostics			
R^2	0.0069	0.0935	0.0520
F statistics (d.f.)	2.07 (20, 173)	2.61 (20, 71)	2.69 (16, 85)
AIC	8.678	9.100	8.512
Sample size	194	92	102
Breusch-Pagan test: χ^2 (d.f.); ('p' value)	20.34 (20) (0.4366)	17.10 (20) (0.6464)	18.58 (18) (0.4184)
Chow test: F statistics	2.22** (9, 177)		

Notes: OLS estimates of abnormal returns at the end of the first day's trading. Regressand: *MAAR0*.

^aWhite's heteroscedasticity-consistent standard errors used to compute 't' statistics.

*, ** and *** denote significance at the 10, 5 and 1% levels, respectively.

multinational and domestic firms are superior, we focus on these split-sample results.

In examining short-run returns, domestic and foreign IPOs differed in several ways. For

multinational firms, pre-IPO profits (*PROFLOAT*) have a significant positive effect on short-run returns, while firm size (*ASSETFLOAT*) has a significant negative effect. Underwriter reputation (*REPUNDER*)

660

665

Table 5. Estimating long-run returns

Regressor	Coefficient ('t' statistic) ^a		
	All firms	Multinational firms	Domestic firms
Constant	-1.13 (2.76)***	-0.74 (1.27)	0.21 (0.52)
GSCOPE	0.08 (2.16)**	0.11 (2.97)***	—
DIVERS	0.48 (2.46)**	0.32 (0.92)	0.43 (2.11)**
DIVERS ²	-0.12 (3.14)***	-0.19 (3.11)***	-0.09 (2.49)**
GSCOPE × DIVERS	0.01 (0.41)	0.14 (3.22)***	—
PROFLOAT	-0.02 (2.90)***	-0.03 (4.02)***	-0.004 (0.73)
MAAR0	-0.006 (2.30)**	-0.007 (1.84)*	-0.001 (0.28)
COST	-2.22 (1.55)	1.39 (0.73)	-3.78 (2.53)**
INTANG	0.923 (1.84)*	4.124 (2.92)***	0.004 (0.03)
FUNDS	0.00002 (0.03)	-0.002 (1.43)	0.001 (2.12)**
ASSETFLOAT	0.002 (2.06)**	0.0007 (0.05)	0.0007 (0.48)
DURATION	0.004 (0.43)	0.03 (1.49)	-0.01 (1.29)
REPUNDER	2.05 (0.01)	3.71 (2.50)**	-0.73 (1.11)
EQUISSUE	-0.54 (2.05)**	-0.83 (2.24)**	-0.71 (2.15)**
YR92	0.78 (2.94)***	0.25 (0.74)	-0.02 (0.08)
YR93	0.69 (2.75)***	0.23 (0.75)	-0.15 (0.65)
YR94	0.78 (3.02)***	0.32 (1.14)	-0.04 (0.20)
YR95	0.86 (3.01)***	0.54 (1.66)	—
ID1	0.82 (3.14)***	0.35 (1.44)	0.62 (2.51)**
ID2	-0.03 (0.14)	-0.18 (0.70)	-0.10 (0.32)
ID3	-0.22 (1.46)	-0.08 (0.41)	-0.79 (3.27)***
ID4	0.07 (0.52)	0.36 (1.87)*	-0.21 (1.54)
ID5	-0.18 (0.97)	-0.32 (0.86)	-0.49 (3.16)***
ID6	0.38 (2.33)**	0.32 (1.19)	—
ID7	0.50 (2.37)**	1.08 (5.54)***	—
Diagnostics			
R ²	0.1210	0.2480	0.0752
F statistics (d.f.)	3.16 (23, 170)	4.30 (23, 68)	2.46 (18, 83)
Sample size	194	92	102
Breusch-Pagan test: χ^2 (d.f.); ('p' value)	27.07 (23) (0.2528)	19.01 (23) (0.6449)	15.61 (18) (0.6195)
Chow test: F statistics	3.37*** (10, 174)		

Notes: OLS estimates of abnormal returns at the end of 36 months' trading. Regressand: MAAR36.

^aWhite's heteroscedasticity-consistent standard errors used to compute 't' statistics.

*, ** and *** denote significance at the 10, 5 and 1% levels, respectively.

has a negative effect that is both large and highly significant. Thus, higher underwriter reputation is associated with lower short-run returns, implying less short-run underpricing. For domestic firms, we find a significant negative effect associated with firm age or duration (*DURATION*). However, we find a highly significant positive effect associated with the measure of the funds raised (*FUNDS*). Agency effects are observed through the significant negative effect of the percentage of equity issued (*EQUISSUE*).

Multinationality and IPO long-run returns

Analysis of the long-run returns reveals several interesting results (Table 5). For the sample as a whole, multinationality has a highly significant positive effect on IPO long-run returns. The number of regions in which the firm has operating subsidiaries

at the time of IPO (*GSCOPE*), has a highly significant positive effect. The linear effect of product line diversification (*DIVERS*) is positive and highly significant, while the nonlinear effect of product line diversification (*DIVERS2*) is negative and highly significant. The value of intangibles (*INTANG*) has a positive effect on performance, while underwriter reputation (*REPUNDER*) does not emerge as significant.

The level of pre-IPO profits (*PROFLOAT*) and the initial level of underpricing (*MAAR0*) have highly significant negative effects. Another important finding of this study is that the percentage of the equity of the firm issued at IPO (*EQUISSUE*) is associated with worse long-run performance. This implies that the more the IPO is used as an exit strategy for the entrepreneur, venture capitalists and other initial backers of the firm, the poorer the long-run prospects

Multinationality and IPO performance

11

for the firm. Firm age (*DURATION*) does not appear to be a significant factor. This is in contrast to the findings reported by Carter *et al.* (1998) for US data. Taken as a whole, these results provide a context in which the differences between multinational and domestic firms can be compared.

The split-sample analysis of long-run results is especially revealing. The analysis highlights differences in the factors affecting the long-run performance of multinational and domestic IPO firms. For multinational firms, the extent of multinationality (*GSCOPE*) has a highly significant positive effect on returns, as does the interaction of multinationality and product diversification (*GSCOPE* × *DIVERS*). The linear effect of product line diversification (*DIVERS*) is not significant, yet the nonlinear term (*DIVERS2*) is negative and highly significant. The level of pre-IPO profits (*PROFLOAT*) is highly negative, as is the percentage of the equity of the firm offered (*EQUISSUE*), and the initial level of underpricing (*MAARO*) is significant and negative.

The analysis of the long-run returns for domestic firms reveals different effects. Product line diversification has a highly significant and curvilinear effect. For domestic firms, the underwriter reputation is not significant, but the effect of unit cost of flotation (*COST*) on returns is highly significant and negative. In other words, the firms that are charged a higher unit cost by investment bankers have a relatively worse performance. The percentage of equity issued (*EQUISSUE*) also has a highly significant and negative effect, while the amount of funds raised in the IPO (*FUNDS*) has a significant positive effect. Size in terms of firm assets does not seem to matter, yet the size of the offering has a significant positive effect for domestic firms. This supports the findings of Brav and Gompers (1997).

The analysis of the returns across two time periods reveals that multinationality does not affect IPO short-run performance, but has a highly significant and positive effect on long-run returns. Multinationality is associated with significantly improved long-run performance. Product diversification reinforces the effect of multinationality as indicated by the highly significant positive coefficient on the interaction term. This indicates that the results obtained for established firms by Hitt *et al.* (1997) hold for IPO firms as well. Multinational firms' short-run returns seem to be significant and negatively associated with long-run performance. The same is true for pre-IPO profits (*PROFLOAT*). These findings support the over-optimism hypothesis of Rajan and Servaes (1997). The larger the pre-IPO profits, the greater the over-optimism and short-run returns, and the lower are the long-run returns.

The analysis also indicates a systematic difference in the factors affecting the performance of multinational and domestic IPO firms. For multinational IPO firms, the level of intangibles and the reputation of the lead underwriter have highly significant and positive effects on performance. In contrast, for domestic IPO firms, the amount of funds raised has a highly significant positive effect, while the costs of going public and the percentage of equity issued have highly significant negative effects.

V. Conclusions

Theory and past research in international business provided several strong reasons to believe that multinationality should be positively associated with firm performance. However, there are several reasons to expect that the effects of multinationality may be different for newly public firms. Testing these competing views reveals that multinationality does matter. IPO firms with a higher level of multinationality outperform domestic IPO firms in the long run. In addition, multinational and domestic IPO firms differ systematically in terms of the factors that affect their performance. While we observe differences for both short- and long-run returns, it is more pronounced for long-run performance.

Multinational IPO performance is affected by the firm's possession of R&D and marketing intangibles, a previously identified success factor for multinational operations (Morck and Yeung, 1991). Multinational IPO performance was also affected by the reputation of the lead underwriter, which is an indication of the quality of the IPO firm's network. Neither of these aspects were significant predictors of performance for the domestic IPO firms. For domestic IPOs, the two aspects affecting performance were the offer size and the cost of going public. The bigger the offer size, the better the performance; and the lower the costs, the better the performance. The offer size is an indicator of the size of the business opportunity while the cost of going public is a gauge of the investment community's judgement of the firm.

These results imply that quality aspects affect performance of the multinational IPO, while quantity aspects affect domestic IPO performance. It may be that multinationals are valued for having big upsides – superior intangibles and an influential network. Domestic IPOs are valued for having small downsides, namely the lower risk associated with a larger offer size and a favourable judgement by the investment community as signalled by the small

costs of going public. Multinational firms appear to be rewarded for their options value, while domestic firms are rewarded for their cash flow value. The contrasting results are consistent with the notion that firms self-select into the two categories based on their resources and capabilities.

Since the split samples of multinational and domestic firms are similar along the dimensions of size, age and percentage of equity issued, our findings are extremely robust to changes in specification and outlier analysis. Because of the quality of the data sample and the strength of the results, we are reasonably confident that the effects that we capture can be ascribed to multinationality, and not to an underlying latent factor.

These results can be interpreted in the spirit of Morck and Yeung (1991), in that, even at the IPO stage, firms that choose to go multinational may possess unique intangible assets that create superior long run returns. As found by Lu and Beamish (2004) and Heirman and Clarysse (2007), investment in intangible assets is closely connected to performance. Firms that run multinational operations prior to IPO may emit a signal to future investors and stock analysts that they have unique resources and capabilities that presage future survival and performance. This result implies a strong strategic message to managers of firms considering going public of the potential benefits of multinational operations.

Further examination of these relationships is desirable. The relationship between multinationality and firm performance is complex, even for small, entrepreneurial firms. Entrepreneurial firms may have multiple or conflicting objectives (Casson, 2003). Qualitative approaches could further examine the role of the individual within an entrepreneurial firm. Other measures of multinationality could be utilized, and explicitly longitudinal analysis could be conducted. Given the positive effect of multinational activity on performance, research is also needed to further explore conditions that encourage entrepreneurs and family-held businesses to engage in multinational operations, as well as factors that hinder multinational operations. Finally, while in this article we study effect of the *extent* of multinationality on firm performance, it would be interesting to study the effect of the *nature* of multinationality. Such a study would examine whether foreign operations in some geographic regions have different effects on firm performance than those in other regions.

Since multinationality seems to affect the financial performance of newly public firms, this area of research would benefit from an increased dialogue across business disciplines. To begin to build the necessary academic bridges, this study has drawn on

research in entrepreneurship, finance, strategic management, marketing and accounting. A continuing dialogue is needed to further explore the relationship between 'going global' and 'going public'.

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Multinationality and IPO performance

13

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