CAPITAL STRUCTURE, GROWTH AND PERFORMANCE OF INITIAL PUBLIC OFFERING FIRMS

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DEDICATION

This thesis is dedicated to my beloved and patient husband, Ali, who has served as my inspiration. It is also dedicated to my parents, who I had promised to make them proud by the achievement of the monumental academic goal and I hope that I have fulfilled that promise. Without their enormous personal sacrifice and unconditional love, I would have never become the individual I am today.

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ABSTRACT

A firm's decision to go public via an initial public offering (IPO) has attracted scholarly attention due to the changes in ownership structure at the time of the IPO. Previous studies have mainly focused on different implications of IPOs, such as the under-pricing phenomenon. However, there is a lack of research investigating the direct impact of IPO on a firm's performance in emerging markets, particularly in Malaysia. Besides, existing literature on the matter indicates mixed results upon the examination of the relationship between post-IPO financing, strategic investments, growth, and performance of IPO firms. Therefore, the first aim of this study is to investigate the effects of IPO on the capital structure, growth, and performance of firms. The second aim of this study is to examine the relationship between post-IPO capital structure and R&D expenditure as a growth strategy of IPO firms. This study utilised Propensity Score Matching (PSM) to compare the capital structure, growth, and performance of firms that have gone public (treated) with non-IPO or untreated firms. Additionally, the System Generalised Method of Moments (GMM) was adopted in the estimation process during the post-IPO period. Based on the firm-level panel data of 295 non-IPO firms listed on the Bursa Malaysia for the period 2000–2011, the PSM analysis showed that going public via IPO contributes to the deterioration in profitability and productivity in the first five years after the listing of the IPO firm. However, IPO firms show better growth than non-IPO firms. The growth differences start to diminish after one year. The results indicated firms that go public, after a period of high growth could strengthen their balance sheets by reducing their debt over equity levels. Meanwhile, the GMM estimation results found that the total sales growth of IPO firms has no association with R&D investment. The results also showed that IPO firms increase their total R & D expenditure in line with the growth of their assets; the lower debt-to-equity ratio also encourages them to increase their R & D investment. This study found that the debt-to-asset ratio has a significant positive impact on the stock market value of IPO firms. However, the debt-to-equity ratio affects the stock market value negatively. Financial leverage has a significant negative impact on profitability but has no impact on the productivity of IPO firms. Finally, the growth of IPO firms has a positive impact on profitability. However, the growth affects their productivity and stock market value negatively. The outcomes of this study provide valuable contributions and practical implications for several key parties, including the firm's managers and investors, to better understand the impact of IPOs on the firm's performance and to better understand the post-IPO behaviour of firms.

ABSTRAK

Keputusan sesebuah firma untuk menjadi syarikat awam melalui terbitan awam (IPO) telah menarik perhatian pengamal pasaran dan penyelidik akademik disebabkan perubahan struktur pemilikan syarikat yang belaku selepas IPO tersebut. Kebanyakan kajian terdahulu hanya tertumpu, umpamanya, pada implikasi IPO ke atas kadar pulangan dan fenomena terkurang nilai. Tidak banyak kajian yang menyelidik kesan langsung IPO kepada prestasi firma di pasaran baru muncul, khususnya Malaysia. Dapatan kajian antara hubungan pasca pembiayaan IPO dengan strategi pelaburan, pertumbuhan, dan prestasi firma juga didapati bercampur-campur. Sehubungan itu, tujuan utama kajian ini adalah untuk menyiasat kesan IPO ke atas struktur modal, pertumbuhan, dan prestasi firma. Manakala, tujuan kedua kajian adalah menguji hubungan antara struktur modal selepas IPO dengan pelaburan terhadap R&D sebagai strategi pertumbuhan firma. Kajian ini menggunakan kaedah skor padanan kecenderungan (PSM) untuk membandingkan struktur modal, pertumbuhan dan prestasi firma IPO (dikategorikan sebagai firma terawat) dengan firma awam bukan IPO (tidak terawat). Manakala, kaedah penganggaran Generalized Method of Moments (GMM) telah digunakan dalam proses penganggaran selepas IPO. Berdasarkan data panel 295 firma bukan IPO yang tersenarai di Bursa Malaysia untuk tempoh 2000-2011, analisis PSM mendapati menjadi syarikat awan melalui IPO menyumbang kepada pengurangan keuntungan dan produktiviti semasa lima tahun pertama selepas tersenarai. Firma IPO juga menunjukkan pertumbuhan yang lebih baik sebelum IPO berbanding firma bukan IPO, namun perbezaan ini berkurangan selepas satu tahun. Hasil kajian juga menunjukkan, secara umum, selepas tempoh pertumbuhan tinggi, menjadi syarikat awam akan memperkukuhkan kewangan firma melalui pengurangan hutang berbanding ekuiti. Sementara itu, hasil penganggaran GMM mendapati pertumbuhan jualan firma IPO tidak mempunyai kaitan dengan pelaburan ke atas R&D. Didapati juga firma IPO cenderung untuk meningkatkan jumlah perbelanjaan R&D mereka selaras dengan pertumbuhan dalam asetnya; nisbah hutang kepada ekuiti yang rendah juga mendorong kepada perbelanjaan R&D yang tinggi. Kajian ini mendapati nisbah hutang kepada aset mempunyai kesan positif terhadap nilai saham firma IPO. Sementara, nisbah hutang kepada ekuiti mempengaruhi nilai pasaran saham firma secara negatif. Manfaat kewangan didapati mempunyai kesan negatif yang signifikan terhadap keuntungan firma tetapi tidak mempengaruhi produktiviti firma IPO. Akhirnya, pertumbuhan firma IPO memberi kesan positif terhadap keuntungannya, namun pertumbuhan tersebut mempengaruhi produktiviti dan nilai pasaran saham firma secara negatif. Hasil kajian ini memberi sumbangan berharga dan implikasi praktikal kepada beberapa pihak termasuklah kepada pengurus firma dan pelabur untuk memahami secara lebih mendalam kesan IPO terhadap prestasi firma, dan memahami tingkah laku firma selepas IPO dalam melindungi firma dan pelabur dari kerugian.

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LIST OF ABBREVIATIONS

ACE	-	Access, Certainty, Efficiency
AGE	-	Firm Age
BM	-	Bursa Malaysia
CDIVI	-	Cash Dividends Paid
CF	-	Free Cash Flow
EBITDA	-	Earnings before Interest, Taxes, Depreciation, and Amortization
EPS	-	Earnings per Share
ESS	-	Employee Share Schemes
ETFE	-	Exchange Traded Funds Equity
FYE	-	Fiscal Year End
GMM	-	Generalised Method of Moments
INDUM1	-	Industrial Products Industry
INDUM2	-	Trading/Services Industry
INDUM3	-	Technology Industry
INDUM4	-	Consumer Products Industry
INDUM5	-	Property Industry
INDUM6	-	Construction Industry
INDUM7	-	Plantation Industry
IPC	-	Infrastructure Project Company
IPO	-	Initial Public Offering
IPR	-	Intellectual Property Rights
LDTA	-	Long-Term Debt to Total Assets Ratio
LEAP	-	Leading Entrepreneur Accelerator Platform
LIQ	-	Liquidity
MESDAQ	-	Malaysian Exchange of Securities Dealing and Automated Quotation
MITI	-	Ministry of International Trade and Industry
MVBR	-	Market Value to Book Value of Equity Ratio
NDP	-	National Development Policy

NEP	-	New Economic Policy
PE	-	Private Equity
PSM	-	Propensity Score Matching
PwC	-	PricewaterhouseCoopers
RBV	-	Resource-Based View
R&D	-	Research and Development
REIT	-	Real Estate Investment Trust
ROA	-	Return on Assets
ROE	-	Return on Equity
SAG	-	Total Sales Growth
SC	-	Securities Commission
SDTA	-	Short-Term Debt to Total Assets Ratio
SIZE	-	Firm Size
SME	-	Small and Medium Enterprise
SPAC	-	Special Purpose Acquisition Company
SYS-GMM	-	System Generalised Method of Moments
TAG	-	Total Assets Growth
TANG	-	Tangible Assets
TBQ	-	Tobin's Q
TDTA	-	Total Debt to Total Assets Ratio
TDTQ	-	Total Debt to Total Equity Ratio
TFP	-	Total Factor Productivity
VC	-	Venture Capital

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Initial Public Offering (IPO) is a stage in the firm's life cycle in which a firm's equity is transferred from being privately-controlled to publicly-traded in the capital market. This change in firm status allows public to buy and sell firm's listed shares on the stock exchange. IPOs are not only used by smaller firms looking for capital to grow but also by large privately-owned firms that seeking to trade publicly. Generally, IPO is a method of increasing the level of firm's capital by selling firm's share to the public (Zimmerer and Scarborough, 2005; Scarborough, 2011). Therefore, IPO is considered as a professional and advanced procedure to grow capital for a firm (Ritter and Welch, 2002).

The decision to go public is one of the most challenging decisions for private firms since it would change the firm capital structure, hence the ownership of the firm. Therefore, it is not surprising that the topics on IPO have attracted the attention of many researchers, investors, as well as decision-makers. For the firm, the decision to go public is motivated by several factors. First, it gives the opportunity to the original investors to cash in a part of their venture capital (Arkebauer and Schultz, 1991; Finkle, 1998). Second, it provides an opportunity for potential investors to invest in firms that have high growth potential (Finkle, 1998). Third, it offers firms to improve their identification and authenticity in the business environment and assists them to raise credibility, enhance bargaining ability, and create awareness as well as products reputation (Finkle, 1998). Fourth, listing in public creates an opportunity for outsiders (investors, auditors, and investment banks) to observe and monitor the firms closely. These concerned outsiders may provide proficiency and lead to boost the prospects and importance of firms (Bolton and Thadden, 1998; Ross *et al.*, 2008). Fifth, firms could use IPOs to attract foreign partnerships (Kim and Weisbach, 2005; Kumar and

Ramchand, 2008). Moreover, it allows obtaining the extra fund to fit internally produced fund for strategic growth (Fama and French, 2004).

Although IPO may bring significant operational and financial advantages to a firm, it is essential to mention its potential drawbacks. For instance, the major changes in management and business operations of firms can be happened due to changes in the firm's ownership. IPOs usually separate ownership from managerial control and possibly deteriorate incentive systems of management (Pagano *et al.*, 1998; Leslie and Oyer, 2008). Besides, IPOs will expose the firm to constant review by the public that could raise the initial cost of being a public firm as well as future expenses. For example, disclosure requirements and the other regulation for the stock market (Draho, 2004). Moreover, IPOs may influence the long-term survivability of a firm due to major changes in the firm capital structure (Fama and French, 2004).

The importance of IPO as a way to increase funds has been studied by many researchers (e.g., Pagano *et al.*, 1998; Al-Barrak, 2005; Shen and Wei, 2007; Cho and Lee, 2013; Chen *et al.*, 2014; Kjeverud, 2017). These studies offered many different aspects and implications of IPOs, such as the initial return and anomalies, which included overpricing and underpricing phenomenon. The results from these studies were different among the marketplace, time, and economic circumstances for each country. On top of this, studies also found that IPOs play a key role for both the issuing company and the investment banks due to a large amount of money involved (Bartling, 2004; Bartling and Park, 2009; Hsu *et al.*, 2010; Tan, 2016). It can also influence others, such as investors, competitors, and financial market members. Consequently, realising the IPO's effects and complex dynamics are crucial for these groups of people.

In Malaysia, IPOs have attracted increasing interest in recent years due to several reasons. First, the offer price mechanism of IPOs in Malaysia is regulated by the Securities Commission (SC) in contrast to the market-driven IPO mechanism in other countries such as the U.K. and the U.S. (Schuster, 2003). However, Mohamad et al. (1994) argued that the pricing mechanism is one of the factors causing Malaysian high IPO underpricing. Second, the differences between listing requirements in Bursa

Malaysia compare to other countries' stock markets. For instance, one of the quantitative criteria to be listed in the Main Board of Bursa Malaysia is to possess a minimum amount of RM30 million in aggregate in 3 to 5 full financial years. Third, Malaysian firms have used IPOs extensively as a tool to increase capital. For example, over the period 1970 to 2013, approximately a total of RM123.83 billion was raised through IPOs (Bank Negara Malaysia, 2014).

Most of the studies that investigated the effects of IPO only look at its impacts on the firm's growth or capital structure. For example, Takahashi and Yamada (2015) studied IPOs' effects on the growth of Japanese listed firms for more than 30 years, while Liu (2004) investigated the impacts of IPOs on 20 American firms' capital structure whose IPO's took place during 1995 to 1996. However, as far as I can ascertain, there is no systematic study has been conducted to analyse the effects of IPOs on both firm's growth and capital structure simultaneously. The interactions between the firm's growth and capital structure probably are varied based on the firm's growth rate or its size. For example, Pagano *et al*. (1998) analysed the determinants of IPOs and found that IPOs are not necessarily connected to the firm's growth. A similar result has also been found by Clementi (2002). In contrast, Aslan and Kumar (2011), using the U.K. database, found that firms grew after the IPOs. All these results may suggest examining the impact of IPOs on firm's growth and capital structure simultaneously could provide a better conclusion.

In addition, while several studies looked into the factors that affect the performance of IPO in the developed markets as well as emerging markets, little is known about the effect of IPO on a firm's performance. Besides, studies in Malaysia particularly focused on the aftermarket and long-run stock price performance of IPOs (e.g., Jelic *et al*., 2001; Chong and Puah, 2009; Abdullah, 2013). Relatively less attention has been paid to the operating performance of firms after they go public and as far as we can ascertain, no studies have been conducted to determine whether a firm's business performance (productivity) changes following an IPO. Following the literature (e.g., Jain and Kini, 1994; Clementi, 2002; Coakley *et al.*, 2007; Chaouani, 2010; Alanazi *et al.*, 2011; Wong, 2012; Tapa and Mazlan, 2013; Pastusiak *et al.*, 2016; Laokulrach, 2019), on average, profitability declines after the IPO, which seems

to speak against the advantages of public status. On the other hand, findings of recent studies (e.g., Aslan and Kumar, 2011; Larrain *et al.*, 2021) reverse previous results and show that firm profitability in fact increases after an IPO. Besides, although the importance of the IPO market for economic growth is undisputed, only a few studies investigated whether an IPO provokes the productivity of firms. Previous studies (e.g., Clementi, 2002; Spiegel and Tookes, 2008; Chemmanur *et al*., 2010; Chemmanur and He, 2011; Takahashi and Yamada, 2015) documented that the productivity declines in post-IPO; however, it is assumed that production depends on physical capital which increases following the IPO (Mungure, 2017). Besides, an IPO allows the firm to overcome the borrowing constraints that keep production at an optimal level. Consequently, a sudden and permanent increase in productivity is triggered by the decision to be publicly traded in the capital market. Therefore, studies on the impact of the IPO on the operating and business performance of a firm are still debatable and remain a promising field of research.

Moreover, growth has several interpretations. Coad and Holzl (2012) argued that the growth rate prediction is difficult, and it is fine to simulate as an accidental process since the persistence of growth rate is not apparent. In several researches, growth is frequently denoted by the rate of increase in the revenue (e.g., Davidsson *et al.*, 2009; Shepherd and Wiklund, 2009; Davidsson and Wiklund, 2013). According to Penrose (1959), growth represents an increment in the amount, size, or quality of productivity and profitability. Meanwhile, in other studies, growth is defined by year-over-year employees growth and revenue growth (e.g., Baum *et al.*, 2000; Story, 2012). Therefore, it is important to provide a definitive description of growth for comparative purposes as sales growth completely varies from employment growth, and absolute growth is different from relative growth (Delmar *et al.*, 2003; Shepherd and Wiklund, 2009).

Besides growth, another critical decision that managements have to make is on the company capital structure. This is because the capital structure of the company could impact the firm financial ratio, hence its risk profile. Based on traditional theories of capital structure, companies select a source of financing depends on the type of debt and equity that can reduce their costs and increase benefits as much as

possible (Titman and Wessels, 1988). IPO is also one of the most essential events for the firms to gain extra capital to finance future growth (Kim and Weisbach, 2005; Celikyurt *et al.*, 2010; Latham and Braun, 2010). Like growth, the capital structure also has several definitions. Schlosser (1989), for example, described the capital structure as a ratio of a firm's debt to its total capital. Meanwhile, in other studies, capital structure has been defined as a firm's total debt to its total asset at book value, the combination of equity, debt, or hybrid securities, and an option between external and internal financial tools for firms (e.g., Haugen and Senbet, 1988; Bos and Fetherston, 1993; Brealey and Myers, 2000).

Several studies have also looked into the interrelation between growth and capital structure (e.g., Anderson, 2002; Amiri and Zade, 2014). However, only a few studies investigated the IPOs' effect of the interrelation between growth and capital structure on the company performance simultaneously. Therefore, to broaden the literature in this area, this research aims to investigate the impact of IPOs on firms' growth and capital structure, and subsequently, the performance of firms.

1.2 Problem Statement

IPOs play an increasingly significant role in developed and developing countries' economies, including Malaysia. In 2012, Malaysia was announced as the fifth-largest IPO market worldwide by issuing a total of RM22.1 billion, which caused the equity market capitalisation to rose by 14.1% to 1.5 trillion compared to 2011. Malaysian capital market also registered an excellent record performance with an increment of 16.4% from RM2.1 trillion in 2011 to reach RM2.5 trillion in 2012 (Securities Commission Malaysia, 2012). In 2019, despite the challenging operating environment and a period of market uncertainties, IPO funds raised from RM0.7billion in 2018 to RM1.97 billion in 2019; however, there was not much variation in equity market capitalisation compared to 2018. Nevertheless, Malaysia's capital market expanded approximately 0.06% to RM3.3 trillion in 2019 against RM3.1 trillion in 2018 (Securities Commission Malaysia, 2019).

Consequently, the IPO performance has an important effect on Malaysian equity market due to its large amount of money involved in this market. However, not much empirical researches have been conducted systematically on the impact of IPOs on the firms' growth, capital structure, and performance. Studies indicate that researchers generally examine the impact of IPO on a firm's growth, or its capital structure, or its performance separately based on their interest of study. Besides, in the past, the IPO's performance was a prevalent topic. However, recently the attention has changed towards the effect of IPOs on the firms' performance. But the conflicting result regarding the impact of IPOs' on firm performance remains as one of the puzzles in the IPO literature. In general, it appears that IPOs are driven by the demand for capital and make spur investment and help growth. However, there is still conflicting evidence on whether this growth is related to higher productivity and profitability. Therefore, it is essential to study IPOs to create a large body of theoretical and empirical literature, especially in the case of Malaysia, as one of the biggest Asian newly industrialized countries (Guillen, 2003; Mankiw, 2014; Mikheeva, 2019).

Very few studies investigated the impact of other types of external financing, particularly IPOs, on firms' growth (Clementi, 2002; Takahashi and Yamada, 2015; Szkuta *et al.,* 2017; Maksimovic *et al.,* 2019). Results from previous studies showed there is no general agreement that firms will grow after their IPOs. Several studies discovered that firms develop after their IPOs (Aslan and Kumar; 2011; Kenney *et al*., 2012; Takahashi and Yamada, 2015; Sharma and Gupta, 2018). In contrast, other studies (Kenney *et al*., 2012; Esumanba and Sare, 2013; Jackowicz *et al*., 2017) found that IPOs are not inevitably related to firm growth, which is in agreement with the results documented by Jain and Kini (1994) and Pagano *et al.* (1998). However, these researches only looked at the within-firm time-series variation or examined the firm's growth alteration around IPOs. This approach unable to expose whether the firm post-IPO growth is higher than the other non-IPO firms. It is well recognized that IPOs have a positive correlation with market conditions (Ritter, 2003; Mohd Rashid *et al*., 2013; Wrońska-Bukalska and Golec, 2016). In this case, the firms' growth may decline after the IPO due to a decline in economic conditions, which cannot be controlled by firms. Therefore, it is not sufficient to apply only a within-firm comparison in investigating the nexus between IPO and firm growth. Besides, it is quite common that firms go public once they reach the peak of their growth (Pastor and Veronesi, 2005; Pastor *et*

al., 2009; Chemmanur *et al*., 2010; Loderer *et al*., 2017). In order to resolve this issue, a between-firm comparison is applied to compare the growth of IPO firms. In this approach, the IPO firms' growth will be compared with the non-IPO firms that have a common characteristic like IPO firms in the same period. From the comparison, if the growth of IPO firms is still higher than the matched firms, this could confidently provide strong evidence that the IPO contributes to firms' growth.

In the process of issuing the IPO, the company's private information is revealed to the public; thus, investors can estimate the value of the firm more accurately. Several studies found that debt affects the level of asymmetric information, hence influences the offer price of the IPOs (e.g., Lemmon and Zender, 2010; Gomes and Phillips, 2012). The results from these studies showed that the company's capital structure could influence the IPOs, and due to this, investors would accept a lower underpricing of the new issue. This brings up the question of whether the IPO could also affect the capital structure. In other words, could IPOs also influence the capital structure of the firms other than the expected fundraising influence? Perhaps firms get back into their routine of searching for profitable projects and balancing their capital structure after an IPO. Therefore, studying the effects of IPOs on the firm's capital structure is essential.

Generally, most of the previous studies have emphasized on the initial or long-run performance of IPOs, and less attention has been paid to shed more light on the influence of IPO on firm performance, especially in developing countries like Malaysia. It is evident that listing firms in the stock exchange as a result of the IPO has some benefits that come with issuing shares to the public (Pagano *et* al.,1998; Chemmanur and Fulghieri, 1999; Ritter and Welch, 2002; Brau, 2012). However, these benefits can only be justified if an IPO has a positive impact on firm performance. Prior studies (e.g., Pagano *et* al.,1998; Huang and Song, 2005; Alanazi and Liu, 2013; Takahashi and Yamada, 2015) have found clear empirical evidence of a decline in post-IPO operating performance of firms. Nevertheless, the institutional features of Malaysian stock market differ from those studied countries (Italia, Gulf countries, and China); hence, it will be biased to generalise their conclusions for other markets like Malaysia. Besides, these studies only concentrate on the impact of IPOs on operating

performance (profitability), and also little systematic evidence exists on how a firm's business performance (productivity) changes following an IPO (e.g., Takahashi and Yamada, 2015; Sohail and Anjum, 2016). It is also worth noting that, to date, in the context of Malaysia, which has one of the more significant and most active exchanges in Asia, there is no concrete research or evidence on the effect of a company going public on its business performance. Hence, this study seeks to fill this gap and provide relevant information for other researchers who want to investigate the effect of listing on firms' performance in a developing country like Malaysia.

The pivotal role of IPOs in mobilising both domestic and external investment funds has been recognised. However to perform this role effectively, IPO firms need to be productive enough to guarantee the growth, subsequently the development and growth of country's economy. Over the past decade, Bursa Malaysia saw 196 IPOs or on average 19 new listings per year. However, IPO activity on the Main Market and ACE Market was reduced for most of the decade. Besides, more companies seem to be delisted from the stock exchange during the decade. According to Bursa statistics, 929 companies were listed in 2019 compared to 957 companies in 2010. Likewise, the number of companies listed on the Main Market reduced from 844 in 2010 to 772 in 2019. In the last decade, IPOs are no longer seen as the only way for companies to increase a considerable amount of money. Instead, private equity (PE) has become an increasingly attractive way for companies to raise capital, which has caused a delay in companies going to market. One of the reasons would be the cost of securing funds via PE is lower than raising funds via IPO. Nevertheless, according to the latest PwC report (2019), the IPO market remains an attractive option for PE firms themselves to exit a company. IPO is proving to be the main source of listing as the PE firms exit. As PE's scale grows, the public market is functioning as an essential exit way for business owners being on domestic or even leading international exchanges. With this in mind, IPO activity in the coming decade could prove to be more vibrant than in the decade. Besides, Malaysia continues to be a favourite investment destination, as it has quality firms and government that are pledged to growth as clearly shown by remained interest in Malaysian offerings by international and domestic investors. Therefore, to improve trading efficiency and enhance the transparency of disclosed financial information in the Malaysian stock market, it is essential to examine the effect of IPOs on financial performance and, eventually, economy growth at firm level.

Another issue concerned in this study is whether the growth strategies pursued by IPO firms facilitate corporate growth. Most of the studies on this issue were focusing on R&D or mergers and acquisitions as the main strategy for firm's growth (e.g., Schultz and Zaman, 2001; Denis *et al.*, 2002; Shimizu and Hitt, 2005). From the corporate perspective, R&D investment is a major driving force for firm's growth (Yuke and Xiaomin, 2015; Guo *et al.*, 2018). Several studies (e.g., Holtzman, 2008; Wang *et al.*, 2013; Guo *et al.*, 2018) pointed out that substantial R&D investment is a catalyst for strategic business growth. Besides, it is associated with firm's operating performance and enhances its competitive advantages and improves its business performance in the future. However, Artz *et al.* (2010) concluded that R&D investment leads to a negative effect on firm's growth and, consequently, its performance. On the other hand, according to Modigliani and Miller (1958) famous proposition, firm's investment and capital structure interact. The empirical studies (e.g., Graham and Leary, 2011; Ghosh, 2012; Paseda, 2016) suggest that R&D investment is one of the major determinants of the cross-sectional variation in the capital structure. For this reason, it is believed that R&D investment strategy and capital structure should be considered and studied jointly (Bragoli *et al.*, 2014; Lambrecht, 2017). However, little attention has been paid to the interaction between a firm's R&D and capital structure. Therefore, this study aims to shed more light on the relationship between firm's capital structure, R&D, and growth. Unfortunately, not many studies have been conducted to investigate the relationship between capital structure, R&D as a growth strategy, and growth of the firm (among the studies are Singh *et al*., 2003; Schmidt *et al*., 2006; Bouraoui and Li, 2014). Besides, only a few researches have investigated this issue from IPO firms' perspective (e.g., Schmidt *et al*., 2006).

1.3 Research Questions

Firms act similar to natural entities in market economies and tend to appear, succeed and develop, and then diminish, often as quickly as they started (Hambrick and D'Aveni, 1988; Mckinley *et al*., 2014). Regularly, the organisational life cycle of firms possesses a period of constancy along with uncertainty as well as volatility. Listing in public is a key event and represents a phase of change in the growth and

capital structure of the firm. In general, this study examines the impact of going public and the implications of using the stock market to the newly listed firms on their growth, capital structure, and how would be their performance and ability to survive after listing to the public. Therefore, this study intends to achieve the following questions:

1. What are the impacts of IPO on firms' growth, capital structure, and performance?
    (a) Do IPO firms grow more than comparable non-IPO firms?
    (b) Do IPO firms have different capital structure profile compare to non-IPO firms?
    (c) Do IPO firms have better performance than comparable non-IPO firms?
2. How is the relationship between IPO firms' capital structure and R&D as a growth strategy?
3. How is the relationship between IPO firms' growth and R&D as a growth strategy?
4. What effect does an IPO firm's capital structure and growth on its performance?

1.4 Objective of the Study

Although the significant role of IPO for economic growth is apparent, just a few researchers have looked into whether IPO motivates the growth of firms or not. Eventually, no researches to date have devoted these questions based on between-firm comparison to see whether these behaviours are common across Malaysia as a newly industrialised market economy, or they are different. Therefore, this study investigates how newly listed firms that sell their shares for the first time to the public as an opportunity to increase capital will affect the firms' growth and capital structure. In addition, this study also investigates the consequences of this change on firm performance in the long-term, covering firm survivability in the aftermarket. The main objective of this research is to appraise Malaysian firms' performance after they go public via an IPO. In this study, this dynamical matter is investigated by concentrating on the growth and capital structure by conducting a between-firm comparison;

comparing these two aspects of IPO firms with the matched firms, those have similar characteristics with IPO firms in the same period. In addition, another objective of this study is to examine the effect of IPO firms' growth and capital structure on firms' performance. The specific objectives of this study are summarized as follows:

1. To analyse the impacts of IPO on firm growth, capital structure, and performance.
   (a) To conduct a comparative analysis between the growth patterns of IPO firms and their matched non-IPO firms.
   (b) To conduct a comparative analysis between the capital structure profiles of IPO firms and their matched non-IPO firms.
   (c) To conduct a comparative analysis between the performance of IPO firms and their matched non-IPO firms.
2. To examine the relationship between IPO firm's capital structure and R&D as a growth strategy.
3. To examine the relationship between IPO firm's growth and R&D as a growth strategy.
4. To investigate the effect of IPO firm's growth and capital structure on IPO firm's performance.

1.5 Significance of the Study

The study is separated and extending the existing studies in several ways. In general, this study makes an important contribution to different strands of current literature. It combines different layers of both empirical and theoretical research. Firstly, although a large number of existing studies have focused on initial public offerings, the majority of these researches only concentrated on the initial returns, operating performance and long-term performance of IPO firms (e.g., Helwege and Packer, 2003; Boehmer and Ljungqvist, 2004; Chemmanur and Paeglis, 2005; Ahmad-Zaluki, 2008; Younesi *et al*., 2012; Leong *et al*., 2015; Wong *et al*., 2017; Ritter, 2018). Only a few studies looked into the potential effects of being listed in the stock market for the first time on the growth, capital structure, and performance of firms (e.g., Clementi, 2002; Liu, 2004; and Takahashi and Yamada, 2015).

Even though the firm's growth is the main concern for business owners and enterprises, the capital structure is also financially important. Besides, it is vital for companies who want to go public to have an idea of the possible relationship between going public and their performance. As a result, the idea enables companies' business owners to define their startegies. Researches indicate that IPOs have a very influential role in every economy, including developing countries. However, little comparative results are known for IPOs' effects on the growth, capital structure, and performance of firms listed in public; thus, much more evidence is needed to be collected. Therefore, the main purpose of this research is to study IPOs' influence on firm growth, capital structure, and performance by using Malaysian IPO's data.

Secondly, despite growing attention to IPOs, only a few researchers have separated IPO firms from other firms like seasoned firms which are publicly traded firms that raise additional capital by selling new shares to the public and studied their aftermarket dynamics (e.g., Fama and French, 2004; Chiyachantana *et al*., 2013; Bhattacharya and Chakrabarti, 2014). IPO firms have distinct characteristics, including age and size, compared to other firms. Hence, studying aftermarket dynamics of only IPO firms as newly traded firms for the first time to the public is an important issue. Therefore, a specific contribution is made in the context of existing literature by investigating these matters related to IPOs.

Thirdly, from a macro perspective, the improvement of a management model of how the businesses change from private status to public status is considerable. While from a micro level, it helps the business owner with appropriate and executable tools. These tools can be used as vital success factors for the firm that might influence the firm and its belongings, the firm's employees, the societies where the firm is located, and also regional economies. As a result, this study involves exploring the pre-IPO growth, capital structure, and performance of firms while paying attention to their post-IPO performance, growth, and capital structure, which adds to the knowledge of business owners and investors to make better decisions that affect their business endeavors.

Lastly, this study applies a much larger sample size compared to the previous studies. The data is gathered in panel firms from different industries. The literature asserts that firm behaviour researches in cross-industry are significant to expand general theories of firm growth (e.g., Audretsch, 1995; Cefis and Marsili, 2005, Cefis and Marsili, 2019). Therefore, this study contributes to the current IPO literature by discussing the IPO impacts upon the strategic decision that drives growth in a multi-industry sample.

Since the IPO is highly demanded globally, it is expected that this study discloses information on IPO and provides evidence whether IPO affects the firm performance that transfers from private ownership to public. Therefore, the results of this study are extremely important since there are not many studies on the impact of IPO on firm performance as to the best of researcher knowledge. Hence this study is expected to contribute significantly to the literature on initial public offering.

1.6 Organisation of the Study

This study is structured into five chapters. The components of the study are shown in Figure 1.1. In more detail, Chapter 1 provides an introduction, including the background of the research, problem identification, objectives and questions of the study, significance and organisation of the study, and conclusions, respectively.

Chapter 2 starts with the Malaysian IPO overview, and the rest of the chapter reviews different aspects of related literature. Chapter 3 outlines the study design, including the data resources, research methodology, and describing econometric techniques applied by first reviewing the data used in this study. Finally, the various test procedures are described at the end of this chapter. This chapter clearly represents each hypothesis related to the specific model. Chapter 4 provides the empirical analysis and summary statistics and discusses the results of the study. The final chapter of this study is the concluding part. It gives a summary of results, indicates the limitations of the study, and outlines several recommendations for future study.

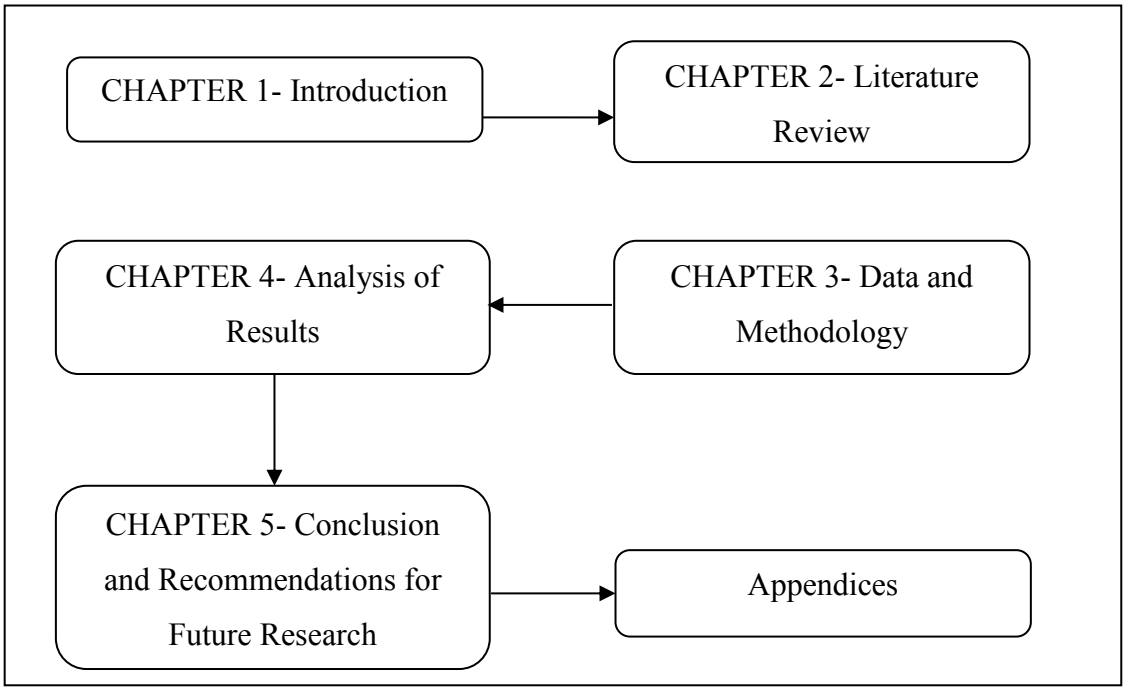

Figure 1.1 Organisation of the Study

1.7 Summary

The financial market starts with the initial market (offering market) where stocks are traded for the first time following the initial public offering. The initial public offering is thus an important financing resource to finance both the private and public firms. Therefore, generating a public listing indicates a defining moment in the firm's life cycle because it gives a wide availability of financial resources. IPOs provide an avenue for equity trading and provide the opportunity for current stockholders to variegate their investments if they select. Hence, IPOs provide capital and an investment solution for a large number of firms as they can offer their investment tools, either debt or equity tools of different sizes and terms. These offerings are between the principal financial sources that assist in establishing and developing the public and private firms. Frequently, IPO causes principle changes in capital structure, ownership structure, and level of operations.

Between multiple reasons for listing in the stock market, increasing the capital level to provide financial growth is one of the most significant. In recent years, the number of IPOs has grown considerably, and it is the focus of many studies in a great number of scopes. Therefore, the worldwide importance of IPOs persuades the study

of firms' behaviour that selected IPO strategy as a method to raise additional capital in one of Asia's largest emerging markets, Malaysia.

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Appendix A Total Factor Productivity (TFP) Calculation

Following Fukao *et al*. (2011) the TFP level of firm i in industry j in year t, $TFP_{i,j,t}$ is defined in comparison with the TFP level of a hypothetical representative firm in the benchmark year t_0 in industry j. The firm-level TFP level is calculated as follows by using the multilateral TFP index method developed by Good *et al.* (1997). This method makes possible not only cross-sectional comparisons but also time-series comparisons of firm-level TFP. Suppose that the data cover a period from t=0 to T and t_0 ($0< t_0 <T$) is the benchmark year. The TFP level of firm i in industry j in year t ($TFP_{i,j,t}$) is calculated by:

$$\mathrm{Ln}\left(\mathrm{TFP}_{i,t,j}\right) = \left(\mathrm{Ln}\ \mathrm{Q}_{i,t,j} - \overline{\mathrm{LnQ}_{t,J}}\right) - \frac{1}{2}\sum_{k=1}^{n}\left(\mathrm{S}_{i,k,t,j} + \overline{\mathrm{S}_{k,t,J}}\right)\left(\mathrm{Ln}\ \mathrm{X}_{i,k,t,j} - \overline{\mathrm{LnX}_{k,t,J}}\right)$$

for t=0

(1)

$$\mathrm{Ln}\left(\mathrm{TFP}_{i,t,j}\right) = \left(\mathrm{Ln}\ \mathrm{Q}_{i,t,j} - \overline{\mathrm{LnQ}_{t,J}}\right) - \frac{1}{2}\sum_{k=1}^{n}\left(\mathrm{S}_{i,k,t,j} + \overline{\mathrm{S}_{k,t,J}}\right)\left(\mathrm{Ln}\ \mathrm{X}_{i,k,t,j} - \overline{\mathrm{LnQ}_{k,t,J}}\right) + \sum_{s=t_0+1}^{t}\left(\overline{\mathrm{LnQ}_{s,J}} - \overline{\mathrm{LnQ}_{s-1,J}}\right) - \sum_{s=t_0+1}^{t}\sum_{i=1}^{n}\frac{1}{2}\left(\overline{\mathrm{S}_{k,s,J}} + \overline{\mathrm{S}_{k,s-1,J}}\right)\left(\overline{\mathrm{LnX}_{k,s,J}} + \overline{\mathrm{LnX}_{k,s-1,J}}\right)$$

for $t > t_0$, and

(2)

$$\mathrm{Ln}\left(\mathrm{TFP}_{i,t,j}\right) = \left(\mathrm{Ln}\ \mathrm{Q}_{i,t,j} - \overline{\mathrm{LnQ}_{t,J}}\right) - \frac{1}{2}\sum_{k=1}^{n}\left(\mathrm{S}_{i,k,t,j} + \overline{\mathrm{S}_{k,t,J}}\right)\left(\mathrm{Ln}\ \mathrm{X}_{i,k,t,j} - \overline{\mathrm{LnQ}_{k,t,J}}\right) - \sum_{s=t+1}^{t_0}\left(\overline{\mathrm{LnQ}_{s,J}} - \overline{\mathrm{LnQ}_{s-1,J}}\right) + \sum_{s=t+1}^{t_0}\sum_{i=1}^{n}\frac{1}{2}\left(\overline{\mathrm{S}_{k,s,J}} + \overline{\mathrm{S}_{k,s-1,J}}\right)\left(\overline{\mathrm{LnX}_{k,s,J}} + \overline{\mathrm{LnX}_{k,s-1,J}}\right)$$

for $t < t_0$.

(3)

Where $Q_{i,t,j}$ stands for the real output (real sales) of firm i (in industry j) in year t, $X_{i,k,t,j}$ represents the real input of production factor k of firm i (in industry j) in year t, and $S_{i,k,t,j}$ is the cost share of production factor k at firm i (in industry j) in year t. $\overline{\text{Ln } Q_{t,j}}$ denotes the arithmetic average of the log value of the output, in year t, of all firms in industry j to which firm i belongs, while $\overline{\text{Ln } X_{k,t,j}}$ stands for the arithmetic average of the log value of the input of production factor k, in year t, of all firms in industry j to which firm i belongs. Finally, $\overline{S_{k,t,j}}$ is the arithmetic average of the cost share of the input of production factor k, in year t, of all firms in industry j to which firm i belongs.

Appendix B Balancing Satisfaction for Panel A, B, and C: Total Sales Growth (SAG)

pscore $treatment $xlist, pscore(sagscore) blockid(sagblock) comsup level (0.001)

- Panel A:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treat
of pscore  |         0          1 |     Total
-----------+----------------------+----------
   .003081 |     1,515         68 |     1,583
        .1 |       409         56 |       465
        .2 |       136         43 |       179
        .4 |         4         26 |        30
        .6 |         0          1 |         1
-----------+----------------------+----------
     Total |     2,064        194 |     2,258

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel B:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************
```

```
The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treat
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0030089 |     1,809         21 |     1,830
      .025 |       612         19 |       631
       .05 |       470         42 |       512
        .1 |       119          8 |       127
        .2 |         9         11 |        20
-----------+----------------------+----------
     Total |     3,019        101 |     3,120

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel C:

```
*****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
*****************************************************

The final number of blocks is 7

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

*********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
*********************************************************

The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treat
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0012384 |     2,447         37 |     2,484
      .025 |     1,403         48 |     1,451
       .05 |     1,222         83 |     1,305
        .1 |       531         77 |       608
        .2 |        80         19 |        99
        .3 |         9         19 |        28
        .4 |         0         12 |        12
-----------+----------------------+----------
     Total |     5,692        295 |     5,987

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
```

Appendix C Balancing Satisfaction for Panel A, B, and C: Total Assets Growth (TAG)

pscore $treatment $xlist, pscore(tagscore) blockid(tagblock) comsup level (0.001)

- Panel A:

```
**************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
**************************************************

The final number of blocks is 8

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treat
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0003274 |     1,168         28 |     1,196
       .05 |       459         32 |       491
        .1 |       312         41 |       353
        .2 |        93         28 |       121
        .3 |        22         22 |        44
        .4 |        24         26 |        50
        .6 |         4         12 |        16
        .8 |         1          5 |         6
-----------+----------------------+----------
     Total |     2,083        194 |     2,277

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel B:

```
**************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
**************************************************

The final number of blocks is 10

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks
**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************
The balancing property is satisfied
This table shows the inferior bound, the number of treated
```

```
and the number of controls for each block

  Inferior |
  of block |         Treat
of pscore  |         0          1 |     Total
-----------+----------------------+----------
   .000169 |     2,894         30 |     2,924
      .025 |     1,276         36 |     1,312
       .05 |       672         33 |       705
      .075 |       371         36 |       407
        .1 |       295         39 |       334
       .15 |        78         40 |       118
        .2 |       113         57 |       170
        .4 |        24         17 |        41
        .6 |         7          6 |        13
        .8 |         1          1 |         2
-----------+----------------------+----------
     Total |     5,731        295 |     6,026

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel C:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 10

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treat
of pscore  |         0          1 |     Total
-----------+----------------------+----------
   .000169 |     2,894         30 |     2,924
      .025 |     1,276         36 |     1,312
       .05 |       672         33 |       705
      .075 |       371         36 |       407
        .1 |       295         39 |       334
       .15 |        78         40 |       118
        .2 |       113         57 |       170
        .4 |        24         17 |        41
        .6 |         7          6 |        13
        .8 |         1          1 |         2
-----------+----------------------+----------
     Total |     5,731        295 |     6,026

Note: the common support option has been selected
****************************************
End of the algorithm to estimate the pscore
****************************************
```

Appendix D Balancing Satisfaction for Panel A, B, and C: Total Debt over Total Assets (TDTA)

pscore $treatment $xlist, pscore(tdtascore) blockid(tdtablock) comsup level (0.001)

- Panel A:

```
**************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
**************************************************

The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks


**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************

The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0013386 |       969         32 |     1,001
       .05 |       547         38 |       585
        .1 |       423         51 |       474
        .2 |       137         51 |       188
        .4 |         1         22 |        23
-----------+----------------------+----------
     Total |     2,077        194 |     2,271

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel B:

```
**************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
**************************************************

The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************
```

```
The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0022237 |     1,972         20 |     1,992
      .025 |       664         20 |       684
       .05 |       470         42 |       512
        .1 |       110         10 |       120
        .2 |         7          9 |        16
-----------+----------------------+----------
     Total |     3,223        101 |     3,324

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel C:

```
*****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
*****************************************************

The final number of blocks is 7

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks


***********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
***********************************************************


The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0015337 |     3,805         83 |     3,888
       .05 |     1,267         97 |     1,364
        .1 |       547         65 |       612
        .2 |        59         10 |        69
       .25 |        12         13 |        25
        .3 |         1         24 |        25
        .4 |         0          3 |         3
-----------+----------------------+----------
     Total |     5,691        295 |     5,986

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

Appendix E Balancing Satisfaction for Panel A, B, and C: Total Debt over Equity (TDE)

pscore $treatment $xlist, pscore(tdescore) blockid(tdeblock) comsup level (0.001)

- Panel A:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************
The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0035846 |       852         27 |       879
       .05 |       653         43 |       696
        .1 |       455         65 |       520
        .2 |       113         56 |       169
        .4 |         4          3 |         7
-----------+----------------------+----------
     Total |     2,077        194 |     2,271

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel B:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied
```

```
This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
    .00246 |     1,936         20 |     1,956
      .025 |       662         20 |       682
       .05 |       466         42 |       508
        .1 |       110         10 |       120
        .2 |         6          9 |        15
-----------+----------------------+----------
     Total |     3,180        101 |     3,281

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel C:

```
*****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
*****************************************************
The final number of blocks is 7

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

*********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
*********************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0013539 |     2,373         41 |     2,414
      .025 |     1,436         44 |     1,480
       .05 |     1,281         99 |     1,380
        .1 |       545         61 |       606
        .2 |        57         11 |        68
       .25 |        16         14 |        30
        .3 |         0         25 |        25
-----------+----------------------+----------
     Total |     5,708        295 |     6,003

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

Appendix F Balancing Satisfaction for Panel A, B, and C: Total Factor Productivity (TFP)

pscore $treatment $xlist, pscore(tfpscore) blockid(tfpblock) comsup level (0.001)

- Panel A:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 7

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks


************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0001517 |     1,521         66 |     1,587
        .1 |       298         28 |       326
       .15 |       145         31 |       176
        .2 |       103         34 |       137
        .3 |        12         14 |        26
        .4 |         3          7 |        10
        .6 |         0         14 |        14
-----------+----------------------+----------
     Total |     2,082        194 |     2,276

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel B:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************


The final number of blocks is 6

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks



************************************************************
```

```
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0026132 |     2,501         39 |     2,540
       .05 |       475         43 |       518
        .1 |       113         12 |       125
        .2 |         6          3 |         9
        .4 |         0          1 |         1
        .6 |         0          3 |         3
-----------+----------------------+----------
     Total |     3,095        101 |     3,196

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel C:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 8

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks
************************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
************************************************************

The balancing property is satisfied

This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0000352 |     2,379         38 |     2,417
      .025 |     1,510         44 |     1,554
       .05 |       772         41 |       813
      .075 |       458         48 |       506
        .1 |       563         80 |       643
        .2 |        49         26 |        75
        .4 |         0          1 |         1
        .6 |         0         17 |        17
-----------+----------------------+----------
     Total |     5,731        295 |     6,026

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

Appendix G Balancing Satisfaction for Panel A, B, and C: Return on Assets (ROA)

pscore $treatment $xlist, pscore(roascore) blockid(roablock) comsup level (0.001)

- Panel A:

```
**************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
**************************************************


The final number of blocks is 5

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks


**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************

The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0024268 |     1,452         60 |     1,512
        .1 |       452         59 |       511
        .2 |       105         36 |       141
        .3 |        23         24 |        47
        .4 |         5         15 |        20
-----------+----------------------+----------
     Total |     2,037        194 |     2,231

Note: the common support option has been selected

****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel B:

```
**************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
**************************************************

The final number of blocks is 4

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks

**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************
```

```
The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0020333 |     2,618         39 |     2,657
       .05 |       461         36 |       497
        .1 |       113         16 |       129
        .2 |         8         10 |        18
-----------+----------------------+----------
     Total |     3,200        101 |     3,301

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

- Panel C:

```
****************************************************
Step 1: Identification of the optimal number of blocks
Use option detail if you want more detailed output
****************************************************

The final number of blocks is 7

This number of blocks ensures that the mean propensity score
is not different for treated and controls in each blocks


**********************************************************
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
**********************************************************

The balancing property is satisfied


This table shows the inferior bound, the number of treated
and the number of controls for each block

  Inferior |
  of block |         Treatment
of pscore  |         0          1 |     Total
-----------+----------------------+----------
  .0012522 |     2,391         38 |     2,429
      .025 |     1,449         52 |     1,501
       .05 |     1,248         78 |     1,326
        .1 |       536         78 |       614
        .2 |        72         23 |        95
        .3 |         1         20 |        21
        .4 |         0          6 |         6
-----------+----------------------+----------
     Total |     5,697        295 |     5,992

Note: the common support option has been selected


****************************************
End of the algorithm to estimate the pscore
****************************************
```

Appendix H Variance Inflation Factor (VIF) and Tolerance (TOL) Test for Multicollinearity

Model 1: IPO Firm's Capital Structure		
Collinearity Statistics		
Variable	VIF	TOL
SAG	1.09	0.920323
TAG	1.08	0.925446
SIZE	1.24	0.803971
AGE	1.11	0.899949
LIQ	1.18	0.847417
TANG	1.26	0.791858
CDIVI	1.00	0.995240
CF	1.11	0.898346
RD	1.14	0.875685
Mean VIF	1.14	
Model 2: IPO Firm's Growth		
Collinearity Statistics		
Variable	VIF	TOL
TD/TA	3.52	0.284361
TD/E	3.38	0.295677
SIZE	1.25	0.798685
AGE	1.11	0.900865
LIQ	1.27	0.785261
TANG	1.28	0.779464
CDIVI	1.01	0.993158
CF	1.10	0.905197
RD	1.12	0.893601
Mean VIF	1.67	
Model 3 : IPO Firm's Performance		
Collinearity Statistics		
Variable	VIF	TOL
TD/TA	3.55	0.281924
TD/E	3.39	0.295130
SAG	1.09	0.919980
TAG	1.09	0.915188
SIZE	1.25	0.797795
AGE	1.11	0.898737
LIQ	1.29	0.777813
TANG	1.28	0.779154
CDIVI	1.01	0.991951
CF	1.11	0.898208
RD	1.14	0.875445
Mean VIF	1.57	