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Does government support make small and medium-sized enterprises reluctant to grow? Evidence from South Korea

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ABSTRACT

This paper investigates whether government support for small and medium-sized enterprises (SMEs) in an emerging economy creates their reluctance to grow, which is analogous to the Peter Pan Syndrome. We test our hypotheses by regression analyses on a sample of 2,779 firms from a unique Korean Innovation Survey dataset from 2005 to 2007. Our empirical results show that SMEs tend to hinder their growth as they approach SME eligibility thresholds beyond which public support ceases. Such a tendency intensifies as SMEs grow closer to the employment-size-contingent SME eligibility threshold and as they receive more public support. In addition, the likelihood of the Peter Pan Syndrome is conditioned by both firm- and industry-specific characteristics. As government support for SMEs based on size-contingent eligibility criteria has a detrimental side-effect, other merit- or effort-based criteria should be considered. It is also desirable to reduce the opportunity cost involved in graduating from SMEs.

KEYWORDS

firm growth; public support; SMEs; Peter Pan Syndrome; eligibility threshold; South Korea

1. Introduction

Government support for small and medium-sized enterprises (SMEs) is common across many countries in the world (OECD 2005). The stated economic rationale for the support is that SMEs suffer disproportionately from market imperfections, despite their importance to job creation and innovation. Accordingly, both researchers and policy-makers have sought to determine whether various types of government support indeed mitigate market imperfections, and thereby help SMEs survive and grow (e.g., Cravo and Piza 2019; Dvouletý, Srhoj, and Pantea 2021).

It is customary that government support for SMEs has a size-contingent characteristic and is available only to firms that are smaller than certain size thresholds (OECD 2010). The typical classification criteria for the thresholds are the number of employees and/or total sales (OECD 2015). For example, the European Union defines SMEs as firms that employ fewer than 250 workers and that have an annual turnover not exceeding EUR 50 million or an annual balance sheet total not exceeding EUR 43 million. Similarly, in the United States, the number of employees is used as an SME

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classification criterion with the eligibility threshold varying from 100 to 1,500 depending on industries. South Korea also uses size-contingent SME classification criteria, such as the number of employees. Specifically, as of our sample period of 2005-2007, Korean SMEs operating in manufacturing industries are firms with fewer than 300 employees or paid-in capital of KRW 8 billion or less.

However, this size-contingent characteristic of government support could create an unintended growth-hampering effect. Specifically, in order to maintain their SME eligibility and continue to receive government support for SMEs, firms may slow down their growth or split some business activities and create new SMEs as they grow closer to the thresholds. The tendency has often been called the Peter Pan Syndrome[1], reflecting Kiley's (1983) psychological phenomenon of immaturity among adults who try to remain as children and avoid growing up.

Given that SMEs constitute a significant part of total employment in many countries and thereby a primary objective of government support for SMEs is to create more jobs through their growth, the conventional rationale for government support for SMEs may lose its legitimacy if it makes SMEs intentionally slow down their growth and hence fails to create more jobs. Moreover, its unintended growth-hampering effect may impede national productivity by generating a distorted firm size distribution with more SMEs than is optimal. From the perspective of Lucas (1978), such a distorted firm size distribution implies a productivity loss of the aggregate economy due to the misallocation of resources to small and inefficient firms (Garicano, Lelarge, and Van Reenen 2016).

Meanwhile, the existence of the Perter Pan Syndrome has recently drawn attention from policy-makers, and there is some anecdotal evidence to support its existence across countries (e.g., OECD 2017a, 2017b; Jones and Kim 2014). However, despite its economic importance and its relevance to the literature on both firm growth and government support for SMEs, it is hard to find academic studies that explicitly examine whether government support for SMEs creates the incentive for the recipient firms to slow down their growth and under what conditions this incentive is more pronounced. Specifically, although many potential determinants of firm growth such as firm size, firm age, and firms' innovation activities are suggested and tested by numerous studies on firm growth (Coad 2009; Lee 2010), the potential growth-hampering effect of government support for SMEs has received little attention (Tsuruta 2020). In addition, previous studies on government support for SMEs focused almost exclusively on examining the effect of a specific SME support program on firm performance (Cravo and Piza 2019; Dvouletý, Srhoj, and Pantea 2021; Tsuruta 2020). However, they largely overlook whether government support can distort firms' incentives for growth when it has a size-contingent characteristic.

This study addresses this lacuna in the literature by empirically investigating whether the Peter Pan Syndrome indeed exists. The study also examines whether firm-specific and industry-specific characteristics that can influence firms' potential for survival and growth and thereby their reliance on public support condition the likelihood of the Peter Pan Syndrome. Specifically, for the firm-specific characteristics, we consider technological competence (Lee 2010) and firm profitability (Ericson and

Pakes 1995; Jovanovic 1982), and for the industry-specific characteristics, we consider the degree of market competition and industry profitability (e.g., Audretsch 1991; Audretsch and Mahmood 1995; Esposito and Esposito 1971).

South Korea presents an interesting setting to study these questions for the following reasons. First, like many other OECD countries, South Korea has substantial government support for SMEs to promote their growth (MSS 2019), which creates substantial opportunity costs for SMEs to graduate from their SME status.[2] Moreover, given the dominant role of big business groups in Korea's economy (OECD 2014a, 2014b), Korean SMEs may be in a weak position to survive without government support, which also increases their incentives to retain their SME status. For example, during the period of 2002-2012, the Korean government spent almost KRW 12 trillion, or approximately USD 11 billion, to subsidize R&D activities of SMEs (Korea Institute of S&T Evaluation and Planning (KISTEP)), 2017) but of the several million SMEs in 2002, only 696 graduated from the SME category by 2012 (Jones and Kim 2014). Hence, Korean SMEs tend to have a clear incentive to remain eligible for government support, which allows us to empirically identify the growth-hampering role of SME support policies. Second, unlike many other OECD countries that employ both the number of employees and total sales as SME eligibility criteria (OECD 2015), South Korea did not use total sales as an SME eligibility criterion until 2009 and used the number of employees as the primary SME eligibility criterion. This institutional setting allows us to test whether the observed SMEs' tendency to remain small is due to the size-contingent characteristic of government support by examining whether such tendency is observed in terms of employment growth but not in terms of sales growth.

While Choi and Lee (2020) only consider government subsidies in a recent study of the existence of the Peter Pan Syndrome, we examine both hard (e.g., subsidies) and soft (e.g., consultancy services) policy instruments. Given the prevalence and the importance of other types of government support for SMEs, especially soft policy instruments (Bruhn, Karlan, and Schoar 2018; Cumming and Fischer 2012; OECD 2005, 2010; Wren and Storey 2002), government subsidies reflect only a limited portion of government support for SMEs, which limits the validity of their measure of government support.

Using a Korean Innovation Survey (KIS) dataset on manufacturing firms, we empirically test the existence of the Peter Pan Syndrome and find the following. First, the Peter Pan Syndrome indeed exists. Second, the syndrome intensifies as SMEs approach closer to the employment-size-contingent SME eligibility threshold and as SMEs receive more government support. Finally, the likelihood of the syndrome is conditioned by both firm- and industry-specific factors: The syndrome is more likely for SMEs with low technological competence and SMEs with low profitability. Furthermore, the syndrome is more likely for SMEs operating in more competitive and less profitable industries.

The paper is organized as follows. Section 2 reviews the literature on firm growth and government support. Section 3 establishes our hypotheses, and Section 4 presents our empirical results. Section 5 concludes this study with some policy implications.

2. Literature review

2.1. Theories on firm growth

Three different explanations have been offered for the patterns and determinants of firm growth, which have been one of the key research topics on firm dynamics in industrial economics and management studies (Coad 2009; Lee 2010; Penrose 1959). First, since Gibrat (1931) and Penrose (1959), scholars have suggested stochastic models of firm growth, which mainly focus on establishing statistical properties of firm size distributions and their dynamics in order to explain the patterns of firm growth. They often found either the Pareto distribution of firm sizes (Axtell 2001) or the Laplace distribution of firm growth rates (Bottazzi and Secchi 2006). However, these studies have provided little theoretical rationale for the idiosyncratic and heterogeneous patterns of firm growth. Furthermore, many empirical studies have found evidence that firm growth is not purely stochastic. It is well known that the patterns of firm growth are influenced by firm size (e.g., Evans 1987a, 1987b; Sutton 1997), firm age (e.g., Evans 1987a, 1987b), and R&D activities (e.g., Coad and Rao 2008).

Second, some studies have provided long-run equilibrium models of firm growth and industry dynamics, which typically postulate the learning process of firms in terms of their efficiency (Jovanovic 1982; Ericson and Pakes 1995) and/or consider financial constraints (Cabral and Mata 2003) to incorporate the empirical findings from existing studies. However, these models, as pointed out by Angelini and Generale (2008), can explain a modest fraction of firm dynamics, although they explain both the size dependence and the age dependence of firm growth.

Third, a few scholars have long suggested that firm growth is closely related to firm-specific technological competence (Mansfield 1962; Nelson and Winter 1982; Kor and Mahoney 2004, Cardoza *et al.* 2015). Lee (2010) proposed an R&D-based model of firm growth, which focuses on the role of a technological-competence-enhancing effect of R&D and considers firm heterogeneity in the technological-competence-enhancing capability. The model shows that firm-specific technological-competence-enhancing capability (or, simply, learning capability) determines the pattern of firm growth: Firms with low technological-competence-enhancing capability follow a convergent growth pattern, in which the rate of firm growth diminishes as they grow, while firms with high technological-competence-enhancing capability show a sustained growth pattern, in which firm growth increases as they grow.

Despite the large volume of the literature on firm growth, relatively less attention is paid to institutional factors that can shape the conditions for firm growth. Among them, various types of government support, in particular, for SMEs, which are common around the world and often have size-contingent characteristics, would be crucial for understanding the growth performance of SMEs. Government support for SMEs, as pointed out by Hart (2000), can promote their growth by easing various constraints, either technological or financial, faced by SMEs. On the other hand, the availability of government support for SMEs may hamper their growth because they lose the support as they grow beyond the size-contingent SME eligibility thresholds. The empirical regularity of a negative growth-size relationship can be, at least partly, attributed to the negative incentives for SMEs to graduate from being SMEs. This

explanation, based on the economic incentives for SMEs, seems more plausible and more easily testable than the prevailing explanation that small firms grow faster in order to reach their minimum efficient scales (e.g., Mansfield 1962; Simon and Bonini 1958).

2.2. Government support and firm performance

A large body of empirical studies has examined the effect of government support for private firms, including SMEs, on their performance (Cravo and Piza 2019; Dvouletý, Srhoj, and Pantea 2021). Previous studies provide empirical findings that largely support a positive effect of government support for SMEs on their technological or economic performance as measured by either the number of patents (e.g., Howell 2017) or employment growth (e.g., Colombo, Giannangeli, and Grilli 2013). These results differ from those of previous studies, which provide diverse and often conflicting findings on the effect of government support on the performance of both SMEs and non-SMEs (e.g., Cerqua and Pellegrini 2014; Gabe and Kraybill 2002). These findings support the ideas that SMEs are more likely to face resource constraints due to limited access to external resources and that government support may help alleviate the constraints.

However, as briefly mentioned in Section 1, little attention has been given to the idea that the substantial government support for SMEs and its size-contingent characteristic may create the incentive for SMEs to retain their SME status, which hinders their growth.[3] Moreover, we also know little about the factors conditioning the likelihood of the growth-hampering effect of government support, or simply the Peter Pan Syndrome. This paper attempts to fill the lacuna by empirically testing the existence of the Peter Pan Syndrome and identifying those factors that influence the likelihood of the Peter Pan Syndrome.

3. Hypotheses

The potential distortionary effects of incentives on the behavior of economic agents, which is also known as gaming responses, have long been discussed in the literature on contract theory (e.g., Baker 1992; Courty and Marschke 2008). When an incentive contract is contingent on a particular outcome measure, agents have an incentive to manipulate the outcome metric or to distort their behavior in order to get the incentive along other dimensions that influence the outcome metric. These distortionary effects of incentives have been observed in many different contexts (e.g., Oyer 1998; Fisman and Wang 2017). For example, Oyer (1998) found that executives and salespeople manipulate prices and their efforts to influence the timing of consumer purchases in order to get bonuses for meeting sales quotas during the fiscal year.

More closely related to our work are the studies that examine the distortionary effects of size-contingent regulations, which are applied exclusively to firms above a certain size threshold, on firms' behavior. For example, Garicano, Lelarge, and Van Reenen (2016) found that small firms in France are reluctant to grow beyond the size of 50 employees in order to avoid labor regulations. Similarly, Sudhir and Talukdar

(2015) found that small firms in India prefer to remain small mainly to avoid government taxes and regulations.

Government support for SMEs has a similar incentive structure. It has a size-contingent characteristic, and SMEs can fully control their sizes. This feature creates a clear incentive for SMEs to slow down their growth and retain their SME status in order not to lose government support. Given that SMEs in many OECD countries, in general, receive substantial government support, the opportunity cost of losing it may be high enough to offset the potential returns associated with growth. Therefore, SMEs are likely to show the Peter Pan Syndrome in order to keep receiving government support. As a corollary, the syndrome is more likely for SMEs whose sizes approach closer to the size-contingent SME eligibility thresholds, beyond which they lose their SME status. Furthermore, the syndrome is also more likely for SMEs that receive more government support, as they face a greater opportunity cost of losing their SME status. Hence, we establish the following hypothesis and corollaries:

Hypothesis 1. SMEs tend to exhibit the Peter Pan Syndrome.

Corollary 1. The Peter Pan Syndrome is more likely for SMEs who grow closer to the SME eligibility thresholds.

Corollary 2. The Peter Pan Syndrome is more pronounced for SMEs receiving more government support.

The factors that influence the costs and benefits of remaining as SMEs can condition the likelihood of the Peter Pan Syndrome. First, we consider the conditioning role of firm-specific technological competence in the likelihood of the Peter Pan Syndrome. In order to remain eligible for government support for SMEs, SMEs need to forgo the potential benefits associated with their unpursued growth. Accordingly, the Peter Pan Syndrome is more likely for SMEs with low growth potential, as the forgone benefits of growth are smaller for them. As shown in Lee (2010), one of the key factors determining a firm's growth potential is its technological competence, which determines the pattern of firm growth: Firms with low (high) technological competence follow a diminishing (sustained) growth pattern. Therefore, it is expected that SMEs with low technological competence have stronger incentives to remain as SMEs, thereby being more likely to be trapped in the Peter Pan Syndrome. Hence, we establish the following hypothesis:

Hypothesis 2. The Peter Pan Syndrome is more likely for SMEs with low technological competence.

Second, we consider firm profitability as a moderating factor. The degree of SMEs' reliance on government support depends largely on how crucial that support is for their survival. Government support is more important for SMEs with a low likelihood of survival because they are more likely to be driven out of the market once they lose government support. Accordingly, SMEs with a low likelihood of survival have a stronger incentive to retain their SME status. As the literature on firm and industry dynamics shows, a firm's survival is directly related to its profitability, which reflects its productivity (Ericson and Pakes 1995; Jovanovic 1982). In particular, profitability is more crucial for the survival of SMEs because they tend to face more stringent financial constraints due to financial market imperfections (Angelini and Generale

2008) and hence rely primarily on internal funds for their investments in physical capital or R&D activities (Czarnitzki and Hottenrott 2011). These findings imply that less profitable SMEs have stronger incentives to remain eligible for government support for SMEs, which hinders their growth. Hence, we establish the following hypothesis:

Hypothesis 3. The Peter Pan Syndrome is more likely for SMEs with low profitability.

Finally, we also consider two industry characteristics, the degree of market competition and industry profitability, as conditioning factors. This is because the importance or cruciality of government support, or its opportunity cost, tends to be greater for SMEs operating in industries characterized by intense market competition and low industry profitability. It is known that an increase in competitive market pressure reduces the overall profitability of firms in the market (e.g., Esposito and Esposito 1971), and that increased competition penalizes less efficient firms more than their efficient counterparts (Boone 2008). Furthermore, it is also known that industry profitability is positively related to the likelihood of firm survival (e.g., Audretsch and Mahmood 1995). In particular, given the relatively low market power or profitability of SMEs, the likelihood of firm survival is low for SMEs operating in industries characterized by high market competition and/or low industry profitability. Hence, SMEs are more likely to exhibit the Peter Pan Syndrome when they operate in more competitive and/or less profitable industries. Therefore, we establish the following hypothesis.

Hypothesis 4. The Peter Pan Syndrome is more likely for SMEs operating in more competitive and less profitable industries.

4. Empirical analysis

4.1. An overview of SME policies in South Korea

In South Korea, the criteria for SME eligibility are stipulated by the Framework Act on Small and Medium Enterprises, which has been amended several times since its enactment in 1966. In this subsection, we briefly illustrate the major amendments to the Act in 2000, 2009, and 2014 and present the associated changes in the criteria and thresholds for SME eligibility for Korean manufacturing firms. Until 2000, firms' number of employees and total assets were used as SME eligibility criteria, and the specific thresholds for each criterion varied across manufacturing industries. In 2000, the Korean government simplified the criteria and thresholds for SME eligibility. In the case of manufacturing firms, the government legally classified SMEs as firms with fewer than 300 employees or paid-in capital of KRW 8 billion or less. In 2009, the government added the average annual sales over the previous three years as a new criterion. Specifically, in order to remain as SMEs, firms need to satisfy at least one of the two existing criteria (i.e., the number of employees or paid-in capital) and have their three-year average annual sales not exceeding KRW 150 billion. In 2014, the three-year average annual sales were chosen as the sole criterion for SME eligibility, whose thresholds varied from KRW 80 to 150 billion depending on manufacturing industries.

The Korean government has long recognized the importance of SMEs as job creators and implemented various types of policies to support SMEs. Until the 1980s, the basic principle underlying SME policies was to protect SMEs from competition with large firms. For example, the Korean government started to reserve certain products for exclusive manufacture by SMEs in 1979, whose scope increased until 1989 and declined thereafter.

However, along with joining the World Trade Organization in 1995, the Korean government has shifted its focus of SME policies from protecting SMEs to enhancing SMEs' competitiveness and ultimately promoting their growth. Accordingly, from the mid-1990s to the present, SME policies in South Korea have mostly aimed to promote SMEs' growth by supporting their various functions, such as R&D and marketing activities. Specifically, the Korean government has implemented both hard and soft policy instruments to support SMEs. The typical examples of these policy instruments are R&D subsidies, low-interest loans, employee training programs, and marketing support, including trade promotion services or consultancy services (MSS 2019).[4] For example, since 1998, when the Korean government introduced the Korean Small Business Innovation Research (KOSBIR) program, R&D subsidies for SMEs have been steadily increased from KRW 264 billion in 1998 to KRW 3.1 trillion in 2018.

It is worth mentioning that, although the criteria and thresholds for SME eligibility have changed over time, the fundamental incentive structure of SME policies in South Korea has remained almost the same since 2000. Specifically, the Korean government has used the size-contingent criteria for the SME classification and implemented many support policies exclusively targeting SMEs. Moreover, although the details of such policies may have changed over time, their main objectives and instruments have remained similar. Hence, SME support policies in South Korea have long created unintended incentives for SMEs to remain small to be eligible for numerous such policies, which contradicts their main objectives of promoting job creations through SMEs' growth.

4.2. Data

The data used in this study were drawn from the 2008 Korean Innovation Survey (KIS) on manufacturing firms, which was administrated by the Science and Technology Policy Institute (STEPI) in Korea. The survey was conducted following the Oslo Manual of the Organisation for Economic Cooperation and Development (OECD). Hence, the survey methods and the questionnaire are largely consistent with those used in the fourth Community Innovation Survey (CIS4).

Specifically, the 2008 KIS sample was drawn from the population of Korean manufacturing firms that are established before 2005 and employ at least ten regular workers. In order to ensure the representativeness of the sample, it was constructed based on a stratified random sampling procedure with stratification by two-digit Korean Standard Industrial Classification (KSIC) and firm size (i.e., the number of employees). The survey was sent to 6,314 firms, out of which 3,081 firms responded (i.e., a response rate of 67.08%). Accordingly, the 2008 KIS compiled information on 3,081

Korean manufacturing firms during the period from 2005 to 2007, including in-depth information on the determinants of firm growth and various types of government support. Specifically, although the 2008 KIS data is cross-sectional, it provides annual data on firm employment and sales, which allows us to measure firm growth over the sample period. After removing some firms with missing values, our sample includes 2,779 firms, consisting of 2,469 SMEs and 310 large firms (i.e., non-SMEs).

We choose the 2008 KIS for the following two reasons. First, the time period of the survey allows us to test whether the size-contingent characteristic of government support for SMEs creates the incentive for firms to restrict their growth. As mentioned in the Subsection 4.1, the Korean government changed the SME eligibility criteria in 2009, which took effect in 2012, by adding the average annual sales over the last three years as a new criterion. This institutional change implies that at least until 2009, firms have the incentive to withhold their growth in terms of employment, but not in terms of sales, in order to remain eligible for government support for SMEs. Hence, we can test whether the observed growth-hampering effect of government support is due to its size-contingent characteristics by showing that it is observed in terms of employment growth but not in terms of sales growth. Second, the 2008 KIS provides information on both hard (e.g., subsidies) and soft (e.g., consultancy services) policy instruments, which is often not available in other data sources. Given that soft policy instruments are widely used in practice (e.g., OECD 2005, 2010) and their importance for SMEs are often emphasized (Bruhn, Karlan, and Schoar 2018; Cumming and Fischer 2012; Wren and Storey 2002), it is important to consider these instruments when we construct a measure for government support, which represents the incentive to retain SME status, or the disincentive to graduate from SME status, in our study.

4.3. Variables

The rate of firm growth is the dependent variable and we use two growth variables alternatively, one for employment growth and the other for sales growth. The rate of employment growth (**Employment Growth**) is measured as the average annual rate of employment growth from 2005 to 2007 using the formula, $(\mathbf{lnSIZE07} - \mathbf{lnSIZE05})/2$, where **lnSIZE07** and **lnSIZE05** are the logarithms of the number of employees in 2007 and 2005, respectively (Evans 1987a, 1987b; Lee 2010). The average annual rate of sales growth (**Sales Growth**) is measured using the formula, $(\mathbf{lnSALE07} - \mathbf{lnSALE05})/2$, where **lnSALE07** and **lnSALE05** are the logarithms of firm sales in Korean won for the years 2007 and 2005, respectively (Evans 1987a, 1987b; Lee 2010). As mentioned in the preceding Subsection of Data, we expect the Peter Pan Syndrome to be observed only with the rate of employment growth as the dependent variable and not with the alternative dependent variable of firm growth defined in terms of firm sales.

The primary independent variable is a measure of government support, which represents the opportunity cost of losing SME status or the potential benefit of government support forgone with the graduation from SME status. The 2008 KIS provides information on seven types of government support that firms received, which can be categorized into two groups: hard and soft types.[5] Given that SMEs' cost of losing

Table 1. Average relative importance of government support and its recipient ratio.

	SMEs (N = 2,469)			non-SMEs (N = 310)			
Types of Government Support	Number of Recipients (A)	Average Relative Importance	Recipient Ratio (A/N)	Number of Recipients (A)	Average Relative Importance	Recipient Ratio (A/N)	Rank
1. R&D subsidy	353	1.157	0.143	78	1.175	0.252	1
2. Public R&D program	257	1.117	0.104	100	1.181	0.323	–
3. Marketing support	275	0.959	0.111	83	0.890	0.268	2
4. Technical staff and education	230	0.940	0.093	85	0.971	0.274	3
5. Technical assistance	232	0.930	0.094	80	0.927	0.258	–
6. Technical information	241	0.915	0.098	94	0.976	0.303	–
7. Public procurement	187	0.817	0.076	69	0.824	0.223	–

Notes: 1. The average relative importance is the average of the relative importance, rated by firms, of each type of government support.
2. The recipient ratio is the share of firms that received each type of government support.
3. The rank indicates in descending order the relative importance of the three most important types of government support to SMEs.

each type of government support depends largely on its importance to SMEs and only the important one creates a clear incentive for SMEs to retain their eligibility for the support, we first evaluate the relative importance or cruciality for SMEs of each type of government support. Fortunately, the KIS asks firms to indicate whether they received each type of government support during the sample period and, if so, to rate its importance on a five-point Likert scale ranging from one (= unimportant) to five (= crucial). In order to evaluate (or rank) the relative importance of each type of government support, we first calculate its relative importance at the firm level and then derive its average for SMEs and non-SMEs, respectively. The relative importance of each type of government support to a firm is calculated by dividing the "absolute" importance value rated by the firm by the sum of the importance values given to the seven types of government support. Next, given that the probability of losing each type of government support due to the graduation from SME status may differ across types, we also consider the availability of each type of government support for SMEs and non-SMEs. Specifically, we construct a recipient ratio for each type of government support for SMEs and non-SMEs, respectively, which is the ratio of the number of SMEs and non-SMEs receiving each type of government support to the total number of SMEs and non-SMEs. Table 1 presents the average relative importance of each type of government support, its recipient ratio, and its ordinal rank.

In our empirical analysis, we primarily consider the three most important types of government support (i.e., R&D subsidy, marketing support, and the provision of technical staff and education) to SMEs. It is worth noting that government support through public R&D programs is not considered partly because it largely overlaps with government support through R&D subsidy and partly because, as indicated by its recipient ratio, it is largely available to non-SMEs. We construct four variables to represent the opportunity cost of losing government support. First, we construct a dummy variable for whether a firm simultaneously received all the three most important types of government support (**Support**): One indicates when a firm received all of them, and zero, otherwise. Second, we construct three additional variables for government support to test Corollary 2. **Support_1** is a dummy variable,

representing whether a firm received an R&D subsidy, which is the most important type of government support, regardless of whether it received any of the other two types of government support, and zero, otherwise. **Support_2** is a dummy variable, representing whether a firm received both R&D subsidy and marketing support, which is the second most important type of government support, regardless of whether it received the provision of technical staff and education, and zero, otherwise. Finally, **Support_A** is a dummy variable that equals one if a firm received all the seven types of government support, and zero, otherwise. **Support_A** is used to test the validity of using only the three most important types of government support for the construction of the variable for government support (**Support**).

Next, we construct several variables for firm- and industry-specific characteristics in order to test their conditioning effects on the likelihood of the Peter Pan Syndrome. For the firm-specific variables, we employ technological competence and firm profitability, and for the industry-specific variables, we employ the degree of market concentration and industry profitability. Following previous studies that consider patents as indicators of technological competence (e.g., Narin, Noma, and Perry 1987; Silverman 1999), a firm's technological competence (**Technological Competence**) is measured as the logarithm of one plus the ratio of the number of its patent applications to the average industry patent applications during the sample period. Hence, it represents to what extent a firm is relatively competent in generating new technology compared to the representative firm (i.e., industry average at the three-digit Korean Standard Industrial Classification (KSIC) level) within its industry. Firm profitability (**Firm Profitability**) is measured as operating profits as a ratio of total sales over the sample period (e.g., Bianchini and Pellegrino 2019). The degree of market concentration is measured as the Herfindahl–Hirschman Index (**HHI**) at the three-digit KSIC level. Industry profitability (**PCM**), or industry price-cost margins, is measured as the ratio of the difference between industry sales and the direct costs of production to industry sales over the sample period at the three-digit KSIC level (e.g., Lee and Mahmood 2009). Information on these industry-level variables was collected from the database constructed by the Bank of Korea, and the Korea Fair Trade Commission.

Finally, we construct a few control variables to control for firm- and industry-specific characteristics that may influence the rate of firm growth. As shown in the literature on firm growth (e.g., Evans 1987a, 1987b; Sutton 1997), it is necessary to control for initial firm size and firm age. Initial firm size is measured as the logarithm of the number of employees in 2005 (**Firm Size**), and firm age is measured as the logarithm of the number of years of firm operation from its establishment to 2005 (**Firm Age**). A dummy variable for whether a firm has its own R&D center or R&D department (**R&D Department**) is constructed to represent the existence of a formal organization explicitly in charge of corporate R&D. Given that an affiliation with major business groups can influence the rate of growth of their subsidiary firms (Campbell and Keys 2002), especially in Korea whose economy is largely dominated by big business groups such as Samsung and Hyundai, we construct a dummy variable for business group affiliation (**Group Affiliation**). Following previous studies (e.g., Bernard and Jensen 1999; Bernard and Wagner 1997), we also control for export intensity (**Export Intensity**), which is measured as the logarithm of one plus the

Table 2. Description of the dependent and independent variables.

Dependent Variables	
Employment Growth	Average annual rate of employment growth from 2005 to 2007
Sales Growth	Average annual rate of sales growth from 2005 to 2007
Independent Variables	
Firm Size	The number of employees in 2005 (in log)
Firm Sales	Total sales in 2005 (in log)
SUPPORT	1 if a firm received the three most important types of government support (i.e., R&D subsidy, marketing support, and the provision of technical staff and education); 0, otherwise
SUPPORT_1	1 if a firm received R&D subsidy, regardless of whether it received any of the other two types of government support; 0, otherwise
SUPPORT_2	1 if a firm received both R&D subsidy and marketing support, regardless of whether it received the provision of technical staff and education; 0, otherwise
SUPPORT_A	1 if a firm received all the seven types of government support; 0, otherwise
Firm Age	The elapsed years from a firm's establishment to 2005 (in log)
Technological Competence	The logarithm of one plus the ratio of the number of patent applications by a firm to the average industry patent applications from 2005 to 2007
R&D Department	1 if a firm had its own R&D center or R&D department; 0, otherwise
Group Affiliation	1 if a firm was a business group affiliate; 0, otherwise
Export Intensity	The logarithm of one plus the share of exports in total sales in 2005
Firm Profitability	The ratio of total operating profits to total firm sales from 2005 to 2007
HHI	The Herfindahl–Hirschman index (at the three-digit KSIC level)
Price-Cost Margin (PCM)	The industry profitability, measured as the difference between industry sales and the direct costs of production as a ratio of industry sales from 2005 to 2007 (at the three-digit KSIC level)
Industry Dummies	Industry dummy variables (at the two-digit KSIC level)

Table 3. Summary statistics and correlation coefficients for the key variables.

					Correlation Coefficient									
Variables	Mean	St.Dev	Min	Max	1	2	3	4	5	6	7	8	9	10
1. **Employment Growth**	0.02	0.14	−1.50	1.10	1.00									
2. **Sales Growth**	0.08	0.21	−1.20	1.94	0.43	1.00								
3. **Firm Size**	3.89	1.41	1.11	9.85	−0.18	−0.08	1.00							
4. **Firm Sales**	8.95	1.91	3.69	16.9	−0.10	−0.15	0.89	1.00						
5. **Support**	0.06	0.24	0	1	0.06	0.05	0.17	0.16	1.00					
6. **Firm Age**	2.19	0.94	0	4.49	−0.16	−0.16	0.44	0.45	0.05	1.00				
7. **Technological Competence**	0.23	0.63	0	1.72	0.02	0.01	0.36	0.35	0.23	0.14	1.00			
8. **R&D Department**	0.38	0.49	0	1	0.01	0.03	0.52	0.52	0.30	0.25	0.40	1.00		
9. **Group Affiliation**	0.07	0.25	0	1	−0.03	−0.01	0.39	0.41	0.06	0.18	0.17	0.23	1.00	
10. **Export Intensity**	0.08	0.18	0	0.69	−0.06	−0.06	0.37	0.38	0.16	0.19	0.19	0.31	0.15	1.00

share of exports in total sales. Finally, we construct industry dummy variables for twenty-two two-digit KSIC industries (**Industry Dummies**) in order to control for the effects of unobserved industry characteristics on firm growth. Tables 2 and 3 present the description of the key variables, their summary statistics, and correlation coefficients.

4.4. Empirical specifications

The baseline empirical specification is as follows:

$$\text{Employment Growth} = \beta_0 + \beta_1 \text{Firm Size} + \beta_2 \text{Support} + \beta_3 \text{Firm Size}_{\text{Support}} + \text{Z} + \varepsilon_i, \quad (1)$$

where **Employment Growth** denotes the average annual rate of employment growth from 2005 to 2007. **Firm Size** is initial firm size. **Support** denotes the dummy variable for whether a firm received the three most important types of government support. **Firm Size_Support** is the interaction term between **Firm Size** and **Support**, whose coefficient indicates whether the Peter Pan Syndrome exists. **Z** denotes a set of control variables including firm age (**Firm Age**), firm-specific technological competence (**Technological Competence**), export intensity (**Export Intensity**), the dummy variables for firms with R&D center or R&D department (**R&D Department**), business group affiliation (**Group Affiliation**), and industry dummies (**Industry Dummies**). ε_i is the error term. Alternatively, we use the average annual rate of sales growth (**Sales Growth**) as the dependent variable in order to test whether the employment-size-contingent characteristic of government support induces the Peter Pan Syndrome.

It is worth mentioning a few points regarding the interpretation of the coefficient of the interaction term between firm size and government support (**Firm Size_Support**). The interaction term should have a negative coefficient in order to show the Peter Pan Syndrome, but the negative coefficient can be interpreted in two ways. On the one hand, the negative coefficient of the interaction term indicates that SMEs with government support slow down their growth as they approach the SME eligibility threshold, thereby showing the Peter Pan Syndrome. On the other hand, the negative coefficient of the interaction term merely indicates that the marginal (growth) effect of government support decreases with firm size. Hence, we examine further the following conditions for the coefficient in order to show sufficiently the existence of the Peter Pan Syndrome. First, we examine whether the negative coefficient becomes positive or statistically insignificant for firms beyond the SME eligibility threshold (i.e., non-SMEs). Second, as in Corollary 1, we examine whether the absolute magnitude of the negative coefficient is greater for large SMEs than their relatively small counterparts. In contrast, if the absolute magnitude of the negative coefficient becomes smaller as SMEs grow, the negative coefficient implies that SMEs are more likely to better utilize government support as they grow. Third, as in Corollary 2, we examine whether the absolute magnitude of the negative coefficient increases with the number of government support. In addition, we examine whether the negative coefficient becomes positive or statistically insignificant for large SMEs when we use the rate of sales growth, which is not an SME eligibility criterion, as an alternative dependent variable for firm growth.

For the test of the conditioning effects of firm- and industry-specific characteristics on the likelihood of the Peter Pan Syndrome, we divide our sample into a few subsamples. First, in order to test for the conditioning role of firm-specific technological competence in the likelihood of the Peter Pan Syndrome (i.e., Hypothesis 2), we divide SMEs into two subsamples according to whether one has at least one patent application during the sample period or not. SMEs with no patent applications are classified as non-innovating SMEs and the others as innovating SMEs. Second, we divide SMEs into two subsamples according to the median value of firm profitability (**Firm Profitability**) in order to test Hypothesis 3 on the conditioning role of firm profitability in the likelihood of the Peter Pan Syndrome. SMEs with firm profitability

(**Firm Profitability**) below its median value are classified as low-profitability SMEs and the others as high-profitability SMEs. Finally, we divide the entire sample into four subsamples according to the median values of the Herfindahl–Hirschman Index (**HHI**) and industry profitability (**PCM**) in order to test Hypothesis 4 on the conditioning role of the two industry characteristics in the likelihood of the Peter Pan Syndrome. Industries with the Herfindahl–Hirschman Index (**HHI**) below its median value are classified as low-concentration industries and the others as high-concentration industries. Similarly, industries with industry profitability (**PCM**) below its median value are classified as low-profitability industries and the others as high-profitability industries. Hence, we construct four different subsamples: L-L (low-concentration and low-profitability) industries, L-H (low-concentration and high-profitability) industries, H-L (high-concentration and low-profitability) industries, and H-H (high-concentration and high-profitability) industries.

We use a variable representing both the availability of government support and its importance for firms receiving government support, as an instrument for the variable for government support (**Support**) and, accordingly, its interaction term with firm size as an instrument for the interaction term between firm size and government support (**Firm Size_Support**). Specifically, we measure the availability of government support as the product of the shares of firms receiving each type of the three most important types of government support at the three-digit KSIC level. The importance of government support for each firm is measured as the product of the absolute importance scores of each type of the three most important types of government support.[6] Finally, we create an instrumental variable for government support by multiplying the two measures of the availability and importance of government support. The idea of choosing this instrumental variable is simply that firms are more likely to receive government support when more government support is potentially available to them (Wallsten 2000) and when government support is more important for them (Lee 2011). However, it seems unlikely for this instrumental variable to be affected by the rate of growth of individual firms. It is found that the instrumental variable is not significantly correlated with the rate of firm growth, but very significantly correlated with the variable for government support.[7] Furthermore, we employ Wooldridge's (1995) robust score test of endogeneity and find that the potential problem of endogeneity of government support is not serious in our empirical model.[8] We also find that the results of instrumental variable regressions are qualitatively similar to those reported in the following subsection.[9]

4.5. Results

The regression results are presented in Tables 4–8 and largely support our hypotheses.

First, Table 4 presents the regression results for the entire sample and four subsamples: non-SMEs, SMEs, small SMEs, and large SMEs. We divided SMEs into the two groups of small SMEs and large SMEs in order to examine whether they show the Peter Pan Syndrome as they approach the employment-size-contingent SME eligibility threshold. In this study, small SMEs are SMEs with 71 employees or fewer, which is the 75th quantile value of the variable for firm size (**Firm Size**), and large

Table 4. The Peter Pan Syndrome in terms of employment growth.

Employment Growth	Model (1) Entire Sample	Model (2) Non-SMEs	Model (3) SMEs	Model (4) Small SMEs	Model (5) Large SMEs
Firm Size	−0.027***	−0.031***	−0.033***	−0.063***	−0.012
	(-8.57)	(-2.52)	(-8.24)	(-9.21)	(-0.99)
Support	0.081**	−0.154*	0.132**	0.197*	0.296**
	(1.96)	(-1.42)	(2.32)	(1.63)	(2.02)
Firm Size_Support	−0.011*	0.022*	−0.023**	−0.044	−0.054**
	(-1.50)	(1.36)	(-1.86)	(-1.27)	(-1.98)
Firm Age	−0.012***	−0.010	−0.013***	−0.010***	−0.024***
	(-3.61)	(-1.15)	(-3.57)	(-2.69)	(-2.63)
Technological Competence	0.016***	0.019***	0.009	0.018**	−0.007
	(2.83)	(2.62)	(1.14)	(1.65)	(-0.50)
R&D Department	0.033***	0.013	0.038***	0.040***	0.039**
	(4.28)	(0.51)	(4.66)	(4.23)	(2.04)
Group Affiliation	0.025**	−0.002	0.019	0.052*	−0.010
	(1.94)	(-0.11)	(0.93)	(1.61)	(-0.38)
Export Intensity	−0.006	−0.053	−0.011	−0.039*	0.053*
	(-0.33)	(-1.17)	(-0.49)	(-1.32)	(1.62)
Industry Dummies	Included	Included	Included	Included	Included
R-squared	0.085	0.213	0.089	0.125	0.103
Observations	2,779	310	2,469	1,852	617

Notes: 1. Huber–White heteroscedasticity-consistent t-statistics are in the parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (on one-tailed tests), respectively.
2. The constant and the coefficients of the industry dummies are not reported.
3. Small SMEs are those with 71 employees or fewer (i.e., the 75th quantile value of the variable for firm size and the other SMEs are grouped as Large SMEs.

Table 5. The Peter Pan Syndrome in terms of sales growth.

Sales Growth	Model (1) Entire Sample	Model (2) Non-SMEs	Model (3) SMEs	Model (4) Small SMEs	Model (5) Large SMEs
Firm Size	−0.009**	−0.025*	−0.008*	−0.010	−0.040***
	(-2.15)	(-1.36)	(-1.62)	(-1.07)	(-2.50)
Support	0.180**	−0.046	0.341***	0.713***	−0.344**
	(2.16)	(-0.27)	(2.87)	(2.64)	(-1.78)
Firm Size_Support	−0.031**	0.011	−0.073***	−0.191***	0.058*
	(-2.13)	(0.46)	(-3.00)	(-2.49)	(1.61)
Firm Age	−0.029***	0.010	−0.034***	−0.032***	−0.044***
	(-5.44)	(0.62)	(-6.02)	(-4.99)	(-3.61)
Technological Competence	0.006	0.003	0.003	0.012	−0.014
	(0.90)	(0.30)	(0.25)	(0.92)	(-0.84)
R&D Department	0.028***	0.034	0.031***	0.023*	0.053***
	(2.40)	(0.70)	(2.51)	(1.44)	(2.46)
Group Affiliation	0.020	0.022	−0.002	−0.016	−0.004
	(1.17)	(1.11)	(-0.09)	(-0.32)	(-0.11)
Export Intensity	−0.054**	−0.020	−0.060**	−0.083**	−0.016
	(-2.25)	(-0.32)	(-2.22)	(-2.22)	(-0.39)
Industry Dummies	Included	Included	Included	Included	Included
R-squared	0.061	0.114	0.069	0.077	0.106
Observations	2,779	310	2,469	1,852	617

Notes: 1. Huber–White heteroscedasticity-consistent t-statistics are in the parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (on one-tailed tests), respectively.
2. The constant and the coefficients of the industry dummies are not reported.
3. Small SMEs are those with 71 employees or fewer (i.e., the 75th quantile value of the variable for firm size and the other SMEs are grouped as Large SMEs.

SMEs are the other SMEs. The regression results of Table 4 indicate the existence of the Peter Pan Syndrome. For the entire sample, as shown in Model (1), the coefficient of the interaction term between firm size and government support (**Firm Size_Support**) is negative and statistically significant. As expected and as shown in

Table 6. The intensity of government support and the Peter Pan Syndrome (SMEs).

Employment Growth	Model (1) SUPPORT_1	Model (2) SUPPORT_2	Model (3) SUPPORT	Model (4) SUPPORT_A
Firm Size	−0.033***	−0.033***	−0.033***	−0.033***
	(-7.96)	(-8.15)	(-8.24)	(-8.36)
Support	0.048*	0.094**	0.132**	0.152**
	(1.30)	(1.92)	(2.32)	(2.32)
Firm Size_Support	−0.008	−0.017*	−0.023**	−0.028**
	(-0.90)	(-1.57)	(-1.86)	(-1.96)
Firm Age	−0.014***	−0.013***	−0.013***	−0.013***
	(-3.68)	(-3.60)	(-3.57)	(-3.57)
Technological Competence	0.010	0.010	0.009	0.010
	(1.19)	(1.17)	(1.14)	(1.24)
R&D Department	0.038***	0.038***	0.038***	0.039***
	(4.42)	(4.66)	(4.66)	(4.76)
Group Affiliation	0.019	0.019	0.019	0.019
	(0.90)	(0.92)	(0.93)	(0.93)
Export Intensity	−0.010	−0.011	−0.011	−0.009
	(-0.46)	(-0.51)	(-0.49)	(-0.43)
Industry Dummies	Included	Included	Included	Included
R-squared	0.086	0.087	0.089	0.089
Observations	2,469	2,469	2,469	2,469

Notes: 1. Huber–White heteroscedasticity-consistent t-statistics are in the parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (on one-tailed tests), respectively.
2. The constant and the coefficients of the industry dummies are not reported.

Table 7. Firm characteristics and the Peter Pan Syndrome (SMEs).

	Technological Competence		Firm Profitability	
Employment Growth	Model (1) Non-innovating SMEs	Model (2) Innovating SMEs	Model (3) Low-profitability SMEs	Model (4) High-profitability SMEs
Firm Size	−0.035***	−0.021***	−0.039***	−0.023***
	(-7.86)	(-2.39)	(-6.34)	(-4.79)
Support	0.197**	0.106**	0.233***	0.021
	(1.83)	(1.66)	(2.71)	(0.29)
Firm Size_Support	−0.038**	−0.016	−0.043***	0.002
	(-1.66)	(-1.15)	(-2.43)	(0.11)
Firm Age	−0.014***	−0.012	−0.016***	−0.011**
	(-3.39)	(-1.28)	(-2.84)	(-2.30)
Technological Competence	–	−0.000	0.001	0.015**
	(–)	(-0.00)	(0.04)	(1.96)
R&D Department	0.042***	0.012	0.035***	0.038***
	(4.39)	(0.57)	(2.98)	(3.27)
Group Affiliation	0.034*	−0.027	0.015	0.041
	(1.39)	(-0.74)	(0.61)	(1.14)
Export Intensity	−0.009	−0.015	0.024	−0.046**
	(-0.39)	(-0.34)	(0.74)	(-1.75)
Industry Dummies	Included	Included	Included	Included
R-squared	0.093	0.125	0.126	0.067
Observations	2,040	429	1,203	1,266

Notes: 1. Huber–White heteroscedasticity-consistent t-statistics are in the parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (on one-tailed tests), respectively.
2. The constant and the coefficients of the industry dummies are not reported.
3. Non-innovating SMEs are those with no patent applications and Innovating SMEs are those with at least one patent application during the sample period. Since Non-innovating SMEs have no patent applications, the variable for technological competence is dropped in Model (1).
4. Low-profitability SMEs are those with **Firm Profitability** below its median value.

Model (2), the coefficient of the interaction term for non-SMEs is positive and statistically significant, showing no signs of the Peter Pan Syndrome. In contrast, as shown in Model (3), the coefficient of the interaction term is negative and statistically

Table 8. Industry characteristics and the Peter Pan Syndrome (SMEs).

Employment Growth	Model (1) Low **HHI** & Low **PCM** industries	Model (2) Low **HHI** & High **PCM** industries	Model (3) High **HHI** & Low **PCM** industries	Model (4) High **HHI** & High **PCM** industries
Firm Size	−0.028***	−0.040***	−0.030***	−0.042***
	(-3.32)	(-5.88)	(-4.58)	(-3.25)
Support	0.187**	0.030	0.045	0.262
	(2.33)	(0.35)	(0.43)	(1.24)
Firm Size_Support	−0.039***	0.002	−0.004	−0.052
	(-2.36)	(0.10)	(-0.19)	(-1.00)
Firm Age	−0.009*	−0.019***	−0.008	−0.012
	(-1.51)	(-2.93)	(-1.20)	(-0.95)
Technological Competence	0.013*	0.003	0.008	0.033*
	(1.50)	(0.16)	(0.51)	(1.55)
R&D Department	0.026*	0.047***	0.033**	0.061***
	(1.48)	(3.71)	(1.97)	(2.51)
Group Affiliation	0.025	0.002	0.014	0.026
	(1.12)	(0.04)	(0.24)	(1.20)
Export Intensity	−0.004	0.025	−0.016	−0.066
	(-0.08)	(0.75)	(-0.44)	(-1.06)
Industry Dummies	Included	Included	Included	Included
R-squared	0.100	0.103	0.080	0.155
Observations	716	909	519	325

Notes: 1. Huber–White heteroscedasticity-consistent t-statistics are in the parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (on one-tailed tests), respectively.
2. The constant and the coefficients of the industry dummies (**DUM**) are not reported.
3. Low **HHI** industries are those with **HHI** below its median value, and low **PCM** industries are those with **PCM** below its median value.

significant for SMEs, indicating the existence of the Peter Pan Syndrome. In order to further check the existence of the Peter Pan Syndrome, we decompose SMEs into small and large ones. As shown in Models (4) and (5), the coefficient of the interaction term is statistically significant only for large SMEs and is greater for large SMEs than for their small counterparts. These results show that the Peter Pan Syndrome becomes evident, as SMEs grow closer to the employment-size-contingent SME eligibility threshold.

Second, Table 5 presents the regression results with the average annual rate of sales growth as the dependent variable. Note that firm size in terms of sales is not a criterion for the SME eligibility. We expect that the Peter Pan Syndrome is not likely with the sales growth as the dependent variable. Hence, comparing the results of Table 5 with those of Table 4 provides a more accurate test for the idea that the employment-size-contingent characteristic of government support induces the Peter Pan Syndrome. As shown in Model (3), the coefficient of the interaction term between firm size and government support (**Firm Size_Support**) is negative and statistically significant for SMEs. However, as shown in Models (4) and (5) of Table 5, decomposing SMEs into small and large ones shows very interesting results: The coefficient of the interaction term is negative only for small SMEs but is positive and statistically significant for large SMEs. These results clearly indicate that large SMEs do not hinder their growth in terms of sales, thereby showing no signs of the Peter Pan Syndrome. The results of Tables 4 and 5 collectively support Hypothesis 1 and Corollary 1 that the size-contingent characteristic of government support creates the Peter Pan Syndrome.

Third, Table 6 presents the regression results using the four different variables for government support that represent different levels of the intensity of government support and thereby different levels of the opportunity cost of losing SME status. These results allow us to examine whether an increase in the opportunity cost of losing SME status (i.e., an increase in the number of the types of government support received) intensifies the Peter Pan Syndrome. Two things are worth mentioning. First, the Peter Pan Syndrome intensifies with the number of the types of government support received by SMEs. As shown in Models (1) through (4), in which the number of the types of government support received by SMEs increases from one (**Support_1**), two (**Support_2**), three (**Support**) to all the seven (**Support_A**), the (absolute) magnitude and statistical significance of the interaction term between firm size and government support (**Firm Size_Support**) increases with the intensity of government support received. These results indicate that the Peter Pan Syndrome for SMEs becomes stronger as the opportunity cost of losing SME status increases. Hence, the result supports Corollary 2. Second, the regression results also confirm, at least indirectly, the validity of using only the three most important types of government support for the construction of the variable for government support (**Support**). This is clear when we compare Model (3) with Model (4), in which the magnitude and statistical significance of the interaction term between firm size and government support are almost the same for the two regression models with the two different variables for government support (i.e., **Support** and **Support_A**).

Fourth, Table 7 presents the regression results to examine the conditioning role of firm-specific technological competence and firm profitability in the likelihood of the Peter Pan Syndrome. As expected, the Peter Pan Syndrome is more evident and statistically significant only for non-innovating SMEs and SMEs with low profitability. These results imply that non-innovating or low-profitability SMEs, to which government support is more crucial, are more likely to show the Peter Pan Syndrome. Specifically, as shown in Models (1) and (2), the coefficient of the interaction term between firm size and government support (**Firm Size_Support**) is negative and statistically significant only for non-innovating SMEs, while it is negative but statistically insignificant for innovating SMEs. Similarly, as shown in Models (3) and (4), the coefficient of the interaction term between firm size and government support is negative and statistically significant only for SMEs with low profitability, while it is even positive, although statistically insignificant, for SMEs with high profitability. These results support Hypotheses 2 and 3. Meanwhile, it is worth noting that the standalone effect of government support, which is positive, is greater and statistically more significant for non-innovating SMEs and SMEs with low profitability than innovating SMEs and SMEs with high profitability. These results indicate that government support is more crucial to non-innovating SMEs and SMEs with low profitability, which are more susceptible to the Peter Pan Syndrome.

Fifth, Table 8 investigates whether certain industry characteristics condition the likelihood of the Peter Pan Syndrome. It presents the regression results for four subsamples of SMEs categorized according to two industry characteristics, the degree of market competition and industry profitability, which may influence the cruciality of government support to SMEs. Here, we find that SMEs are more likely to show the

Peter Pan Syndrome in industries characterized by intense market competition and low industry profitability. As shown in Models (1) through (4), the interaction term between firm size and government support (**Firm Size_Support**) has a negative and statistically significant coefficient for SMEs operating in industries characterized by low market concentration and low industry profitability. These results support Hypothesis 4 that the Peter Pan Syndrome is more likely for SMEs operating in more competitive and less profitable industries.

Sixth, the coefficients of the control variables have, in general, expected signs. First, as shown in Table 4, firm size (**Firm Size**) is negatively related to the rate of firm growth, which has been typically found in previous studies on firm growth (e.g., Evans 1987a, 1987b; Sutton 1997). Second, as frequently found in most previous studies (e.g., Evans 1987a, 1987b) and as shown in Table 4, firm age (**Firm Age**) is also negatively related to the rate of firm growth. Third, as expected, the coefficients of the variable for firm-specific technological competence (**Technological Competence**) and the dummy variable for firms with R&D centers or R&D departments (**R&D Department**) are largely positive. Fourth, as shown in Table 4, the dummy variable for business group affiliation (**Group Affiliation**) shows a positive and statistically significant coefficient for the entire sample and the subsample of small SMEs. This implies that SMEs with business group affiliation may have better access to financial and other resources. Finally, as shown in Table 4, the effect of export intensity on firm growth differs substantially across the subsamples of firms, which is consistent with the mixed results frequently observed in previous studies (e.g., Bernard and Jensen 1999; Bernard and Wagner 1997).

Finally, as a robustness check of our main results reported in Tables 4–8, we conduct some additional analyses. First, we use, following Scandura (2016), a matching-approach combined with an OLS estimation, which employs a propensity score matching method to select a control group of non-supported firms, and runs OLS regressions on the matched sample of the supported and non-supported firms, in order to address the potential sample selection bias in receiving government support. The estimation results for the matched sample also support our hypotheses and remain qualitatively the same as those reported in Subsection 4.4. Furthermore, we employ several alternative firm sizes to classify SMEs into large and small SMEs and find supportive results for our hypotheses. For example, in order to see whether SMEs with sizes closest to the SME eligibility threshold clearly show the Peter Pan Syndrome, we create a dummy variable for those large SMEs, which are larger than the 95th quantile value of firm size or, in our sample, SMEs with more than 280 employees. For those largest SMEs, the interaction term between the dummy variable and government support has a statistically significant, negative coefficient, confirming the existence of the Peter Pan Syndrome.[10]

5. Conclusion

This paper aims to contribute to the literature on firm growth and government support for SMEs by empirically examining whether the Peter Pan Syndrome exists and whether it is more likely for certain SMEs and industries. We employ a unique KIS

dataset that includes detailed firm-level survey information on Korean manufacturing firms and the availability and importance of various types of government support.

Our key findings are as follows. First, indeed the Peter Pan Syndrome exists for SMEs, in which the rate of firm growth decreases as SMEs approach the employment-size-contingent SME eligibility threshold. Second, the Peter Pan Syndrome intensifies as SMEs grow closer to the employment-size-contingent SME eligibility threshold and as the opportunity cost of losing SME status increases (i.e., as the number of the types of government support received increases). Third, the Peter Pan Syndrome is more likely for SMEs with low potential for survival and growth, such as those with low technological competence, low profitability or operating in more competitive and less profitable industries. Finally, it is worth noting that while Choi and Lee (2020) pay less attention to the potential endogeneity problem, we find that the main results of this study are robust to alternative estimation approaches that address the potential endogeneity of government support. Specifically, we find qualitatively the same results by employing an instrumental variable approach (Wallsten 2000) and a matching approach combined with an OLS estimation (Scandura 2016).

This study has potentially important policy implications. This study shows that although government support for SMEs often aims to promote job creations by stimulating SMEs' growth, it, in fact, creates the disincentive for SMEs to grow beyond a certain threshold in size. This result suggests that policy-makers need to be cautious about encouraging support policies that exclusively target SMEs and need to consider the unintended growth-hampering effect in order to fully evaluate the effects of such policies on SMEs' growth.

Moreover, the result also suggests that it may be necessary to revise support policies for SMEs to mitigate their unintended growth-hampering effect. First, it may be helpful for policy-makers to consider new eligibility criteria for government support other than size-based criteria, given that the ultimate goal of the support is to create more jobs by enlarging firm sizes. For instance, it might be better to provide more support for young and innovative firms that are known to be outstanding job creators but subject to market failures. Second, in order to mitigate the disincentive for SMEs to grow, policy-makers need to reduce the opportunity cost involved in graduating from SMEs. For instance, it can be desirable to gradually reduce government support along with firm sizes rather than abruptly interrupting all of it for firms beyond a particular size threshold. It may also be worth considering the policy of relaxing regulations that are applied exclusively to non-SMEs. Moreover, rather than providing a large amount of government support to a few SMEs, providing a small amount of government support to a large number of SMEs may be helpful to mitigate the Peter Pan Syndrome.

This study has some limitations. First, as the 2008 KIS data is cross-sectional, we cannot fully control for unobserved firm-specific characteristics that can influence firm growth. Hence, it is desirable to test the robustness of our findings by using some panel data that are more appropriate to control for the unobserved firm-specific characteristics. Moreover, as the 2008 KIS data cover the period of 2005-2007, which may be outdated, it is desirable to test the robustness of our results by employing more recent data. Second, we measure the government support for SMEs as dummy

variables indicating whether or not firms received certain types of government support. As the dummy variables for government support cannot reflect the magnitude of each type of government support, we cannot test for potential nonlinear effects of government support on the Peter Pan Syndrome. Future research could benefit from more detailed data on the amount of government support granted to individual SMEs. Third, in this study, we did not consider the possibility that, in order to remain eligible for government support, SMEs may separate some of their businesses into new affiliates or expand their overseas production. Future research may extend our understanding of the distortionary effects of government support for SMEs by using more information on these responses of SMEs upon facing the graduation from the SME status.

Notes

1. While the Peter Pan Syndrome originally refers to a psychological state of immaturity, we draw this analogy to include intentional behavior of firms not to grow given a certain incentive structure.
2. For example, in 2011, the central government of Korea implemented 201 support programs for SMEs, with total expenditures of KRW 9.7 trillion (0.8 percent of GDP). Moreover, the provincial governments and other SME-related organizations also independently administrated 1,101 SME support programs. In addition to these SME support programs, firms that grow beyond SME classification thresholds lose their access to 47 government support measures covering taxes, marketing, and employment (OECD, 2014a, 2014b).
3. Government support for SMEs may, in general, has a negative effect on SMEs' performance. First, government support for SMEs can intensify competition in both product and factor markets by increasing the entry of SMEs while decreasing their exits, thereby negatively affecting the overall performance of SMEs (Caballero, Hoshi, and Kashyap 2008). Second, government support, particularly for R&D activities, may also create adjustment costs associated with utilizing it, which at least temporarily have a negative effect on the performance of its recipient SMEs (Himmelberg and Petersen 1994). However, unlike the Peter Pan Syndrome, these effects are not size-contingent, and, contrary to the Peter Pan Syndrome, more likely to be greater for small SMEs than large ones.
4. For more detailed information on government support for SMEs, see MSS (2019) and OECD (2014a, b), among many others.
5. Specifically, hard types of government support are the R&D subsidy and public procurement, and soft types are the public R&D program, technical assistance, technical information, technical staff and education, and marketing support. Marketing support also includes trade promotion services to promote exports. It is worth mentioning that although the 2008 KIS provides information on the R&D tax credit, we did not use this information because, unlike other types of government support, the R&D tax credit is universally available to all SMEs.
6. The importance of government support for each firm is normalized by subtracting the industry average of the importance of government support in order to consider inter-industry differences in firms' evaluation of the importance of government support.
7. The correlation coefficient between the average annual rate of employment growth and the instrumental variable is small (0.03) and statistically insignificant at best at the 10% level. In contrast, the correlation coefficient between the variable for government support and the instrumental variable is relatively large (0.42) and statistically significant at least at the 1% level.

8. The test statistic is 1.13 with a *p*-value of 0.57. Hence, we cannot reject the exogeneity of both the variable for government support (**Support**) and the interaction term (**Firm Size_Support**) at the 10% level.
9. The results of instrumental variable regressions are available from the authors upon request.
10. The regression results are available from the authors upon request.

Disclosure statement

No potential conflict of interest was reported by the authors.

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