Incremental Innovation, Government Subsidies, and New Venture Growth:
Moderating Effect of Media Coverage

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ABSTRACT

Based on resource-based theory, signal transmission theory, government intervention theory, and firm growth theory, this study constructs a model of new venture growth from the perspective of incremental innovation through theoretical derivation and empirical research. The goal is to clarify the mechanism of the role of incremental innovation, government subsidies, and new venture growth. This article takes the GEM-listed enterprises from 2009 to 2018 as the research sample to empirically test the hypothesis of correlation, and the results show that: (1) Incremental innovation has a significant positive effect on both government subsidies and new venture growth; (2) Government subsidies have a significant positive effect on new venture growth and play a partial mediating role in the relationship between enterprises incremental innovation behavior and new venture growth; and (3) Media coverage positively moderates the relationship between incremental innovation and government subsidies, that is, there is a signal transmission phenomenon among start-ups, government departments, and external investors.

KEYWORDS

Government Subsidies, Incremental Innovation, Media Coverage, New Venture Growth

INTRODUCTION

At present, small and medium-sized enterprises, entrepreneurial enterprises, and science and technology innovation enterprises have gradually become the main force of technological innovation and mode innovation. However, the characteristics of entrepreneurial enterprises, such as "small and weak," "resource constraint," and "low-risk resistance," have become an important factor hindering the growth of entrepreneurial enterprises. Because of the constraint of innovation resources, start-ups adopt the

gradual innovation mode of low R&D cost, short R&D cycle, and fast technology updates. What is incremental innovation? Incremental innovation refers to improving and enhancing existing technologies, products, and processes (Lennerts et al., 2019; Yang et al., 2022). In its formative days, the firm Toutiao, which specializes in developing recommendation engine products based on data mining, had no news website and lacked editors. Still, they later adopted pure technical algorithms to mine valuable content from massive news and websites and quickly push them to customers. Through this series of low-cost incremental innovations, it has surpassed many traditional news portals and APPs in China and gradually formed its unique value and competitive advantage. However, the development prospects of entrepreneurial enterprises are highly uncertain and often constrained by capital, technology, and other asset resources. Therefore, government departments must formulate supportive plans to support the growth of new ventures, including providing government subsidies and loan discounts. The hot issue of Chinese entrepreneurial enterprise growth theory and practice is how to help new ventures grow into "specialized, special and new" small and medium-sized enterprises, namely the type of small and medium-sized enterprises with the characteristics of "specialization, refinement, characteristics and novelty" and "little giant" enterprises referring to the small-sized enterprises with good performance, excellent development potential and cultivation value at the initial stage of growth.

As for the research on the impact of incremental innovation on government subsidies, scholars hold the same view that incremental innovation has a significant role in promoting government subsidies. Cao (2017) and Xiong et al. (2020) point out that the government will consider the resource accumulation, technological research and development, and management level of enterprises to evaluate their performance in implementing innovation subsidy policies when selecting subsidy targets. There has been a long debate on the promotion or inhibition effect of government subsidies on the growth of entrepreneurial enterprises. We roughly divided the research results of the academic community into two categories: first, government subsidies play a significant role in promoting the growth of entrepreneurial enterprises. Government subsidies serve as an "invisible credit guarantee" for enterprises. Enterprises receiving government subsidies indicate that the government recognizes their innovation ability or development potential. Through the signal transmission game between government departments and external investors, it is beneficial to reduce the information asymmetry risk of external investors and help enterprises obtain external financing. In addition, from the experience of many regions around the world, through the signal transmission between government departments and external investors, government subsidies also support the growth of entrepreneurial enterprises from the aspects of easing the financing constraints of entrepreneurial enterprises, reducing information asymmetry and system construction, to enhance the competitiveness of enterprises (Feldman & Kelley, 2006; Meuleman & Maeseneire, 2012; Ma & Wang, 2015; Zhu et al., 2016; Yue, 2018). Second, the rent-seeking behavior of enterprises may offset the positive effect of government subsidies. The rent-seeking theory points out that the government uses administrative power to intervene and regulate the economic activities of enterprises and individuals, which hinders market competition and creates opportunities for a few privileged people to obtain excess income (Krueger, 1974). From the perspective of rent-seeking theory, the rent-seeking behavior of enterprises will use limited resources for non-productive activities of enterprises, which will undoubtedly bring the "crowding out effect" to productive activities such as innovation, R&D, and project investment of enterprises, thus detrimental to the long-term development of enterprises (Hellman et al., 2019; Du et al., 2010; Yu et al., 2010; Yan et al., 2014; Bu & Wang, 2014).

As new entrants to the market, entrepreneurial enterprises often face problems such as a lack of team experience, imperfect internal organization procedures, and insufficient initial resources within the enterprise, which make it impossible for the government, external investors, and consumers to truly understand the operation, management, and technology of entrepreneurial enterprises. Therefore, there is information asymmetry among entrepreneurial enterprises, external investors, the government, and consumers (Yi & Xia, 2018; Xiao & Yao, 2021). In the context of Chinese entrepreneurship, the growth of entrepreneurial enterprises cannot be separated from the support of financial capital and physical

resources, which mainly come from external investors, the government, and consumers (Dushnitsky et al., 2021). However, this information asymmetry prevents external investors, governments, and consumers from supporting new ventures and their growth. Government subsidies and media coverage are critical factors in breaking down this barrier. On the one hand, after strict professional evaluation, government-subsidized new ventures enhance the recognition and trust of the government, external investors and consumers. On the other hand, the fact that enterprises receive subsidies will also be spread through the review announcements issued by the official media, news websites and local newspapers. In particular, the influence of social media on information dissemination cannot be ignored (Goel & Donaldson, 2021; Mutambik et al.,2021; Ram & Zhang, 2021; Vatanasakdakul et al.,2020). Because to information asymmetry, the entrepreneurial enterprises often reported positively by the media undoubtedly eliminate the scruples of external investors, the government, and consumers. Thus, it is conducive for the new ventures to obtain the support of financial capital and physical resources from them. For example, by promulgating the *Interim Measures for the Gradient Cultivation and Management of High-quality Small and Medium-sized Enterprises*, the Chinese government conducts a strict review of high-quality small and medium-sized enterprises and classifies them into different groups, such as innovative small and medium-sized enterprises, "specialized, special and new" enterprises and "little giant" enterprises, and provides government subsidies for high-quality small and medium-sized enterprises at different levels. Many enterprises attach great importance to the title of "specialized, special and new" small and medium-sized enterprises and "little giants" enterprises, and the degree of attention even exceeds the government subsidies. New ventures with these titles mean that they are not only recognized by the government, the media, external investors, and consumers, but also easier to obtain resources and support from outside, which will help to promote the growth of entrepreneurial enterprises.

Bushee et al. (2010) describe that media as an effective information medium. The media governance theory points out that the media will report some scandals or improper behaviors of listed companies (Miller, 2006), which will affect investor sentiment (Jin et al.,2022), the image and social reputation of the enterprise, and ultimately encourage the enterprise to improve its internal organizational structure and urge the enterprise to fulfill its social responsibilities. Since start-ups do not need to disclose annual reports and essential information regularly like listed companies, and the opportunities for media coverage are relatively small. Thus, it is more precious for the development of start-ups to get media attention. The government selects the subsidy target through strict review and assessment. The media will not only pay attention to and report the information of the enterprises subsidized by the government but also give more continuous attention and reports to these enterprises in the future. Therefore, these start-up enterprises will get higher recognition and trust from investors and consumers. Meanwhile, the media will urge enterprises to use government subsidies for product innovation, technology innovation, production process innovation, and other productive activities through the information dissemination mechanism and reputation mechanism (Li & Xiong, 2012) to reduce the rent-seeking behavior of enterprises and form the media governance function (Li & Xiong, 2012; Li & Xu, 2013; Yang, 2016). Jiang et al. (2019) describe that under high media attention, enterprises are also more likely to obtain the policy preference of the government in implementing subsidies. Under increased media attention, enterprise managers are more willing to maintain their hard-won reputation and use limited resources for productive activities such as enterprise innovation and investment in innovative projects to enhance the innovation competitiveness of the external market, thereby promoting the sustainable development of enterprises.

Although there have been many achievements in the research of incremental innovation and government subsidies on the growth of start-ups, the research on the action mechanism of incremental innovation, government subsidies, and new ventures growth is slightly insufficient, especially the research on how this essential factor plays a vital role between incremental innovation and government subsidies. Based on this, this study starts from the perspective of incremental innovation, puts incremental innovation, media coverage, government subsidies, and new venture growth in the same

theoretical framework, and constructs a new venture growth model based on incremental innovation. Then, through theoretical deduction and empirical study of Chinese listed enterprises, this paper clarifies the action mechanism of incremental innovation, government subsidies, new venture growth, and the regulation mechanism of media coverage.

THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

Incremental Innovation and the Growth of Start-Ups

The resource-based theory points out that the competitive advantage of enterprises comes from unique heterogeneous resources, and the non-imitation of resources leads to the sustainability of competitive advantage (Wernerfelt, 1984). Based on resource-based theory, Gilbert et al. (2006) argue that due to the lack of production, operation, management experience, and social reputation, entrepreneurial enterprises face significant difficulties acquiring innovation resources, such as asserting resources and knowledge resources. Therefore, acquiring innovation resources for entrepreneurial enterprises determines the survival and growth of enterprises. Yao et al. (2019) emphasize that, with the increasingly free and open business environment in China, most startups in the early stage of development tend to choose incremental innovation. Incremental innovation is a relatively conservative innovation method. Its advantages lie in the short innovation cycle, less investment, low risk, and controllability, which is conducive to helping enterprises to improve operational efficiency and short-term performance and obtain capital, technology, and other asset resources and knowledge resources such as operation and management. To optimize the internal process and management of enterprises and promote the growth of start-ups (Yao et al., 2019; Qi et al., 2020; Su et al., 2021). Gong and Liu (2022) also state that incremental innovation takes "refinement, selection, replication, and promotion" as the innovation goal and improves, expands, and develops existing products. This innovative approach benefits entrepreneurial enterprises to improve existing products and develop new technologies to gain market share quickly, recover investment funds, and expand enterprise scale. Accordingly, this study puts forward the following assumptions:

H1: Incremental innovation can promote the growth of new ventures.

INCREMENTAL INNOVATION AND GOVERNMENT SUBSIDIES

For the government, government subsidies aim to encourage enterprises to increase innovation and research and development efforts, drive enterprise development, and promote economic growth in the jurisdiction. When the government selects subsidy objects, it will consider the resource accumulation, technology research and development, and management enterprise management levels performance in implementing the innovation subsidy policy (Ma & Wang, 2015; Mao & Xu, 2015). Ettlie and Reza (1992) note that incremental process innovation reduces product cost and raw material consumption by improving production. The same product with a lower cost price effectively improves enterprises' market competitiveness. Helian and Yan (2014) propose that incremental innovation is conducive to enhancing customer satisfaction with products and technical processes and effectively increasing the market share of enterprises. Through incremental innovation, enterprises can achieve innovation performance and improve operation and management efficiency in a short period, which is conducive to rapid acquisition of market share and expansion of enterprise-scale so that the enterprises can meet the government subsidy assessment standards for enterprise scale, resource accumulation, technology research and development, and management level. Improving the government's recognition of entrepreneurial enterprises is beneficial, increasing the probability of them obtaining government subsidies (Li & Yu, 2015; Zhu et al., 2016; Cao, 2017; Xiong et al., 2019). Accordingly, this study proposes the following hypotheses:

H2: Incremental innovation can promote government subsidies.

GOVERNMENT SUBSIDIES AND THE GROWTH OF ENTREPRENEURIAL ENTERPRISES

The development prospects of entrepreneurial enterprises are highly uncertain, and are often constrained by resources such as capital and technology. Besides, due to the lack of credible operational records, new ventures often face the problem of information asymmetry (Zheng et al.,2021). Government departments are required to formulate support plans to support the growth of entrepreneurial enterprises, including providing government subsidies and loan discounts to entrepreneurial enterprises (Mao & Xu, 2015). Entrepreneurial enterprises that receive government subsidies make up for the lack of external credit for entrepreneurial enterprises, and alleviate the information asymmetry between the government, external investors, and consumers towards entrepreneurial enterprises, thereby improving the social reputation and influence of entrepreneurial enterprises. The help of government subsidies to enterprises has exceeded the direct support of funds. At the same time, government subsidies enhance the confidence of external stakeholders in enterprises, help start-up enterprises to attract external financing, and provide support and guarantee for the production, operation and internal management of start-up enterprises, promoting the growth of start-up enterprises (Feldman & Kelley, 2006; Adegboye & Iweriebor, 2018; Yang & Zhang, 2008; Zhou et al., 2014). Yang et al. (2015) take GEM-listed enterprises as the research object. Through empirical research, they find that the government's subsidies to start-ups can relieve the capital pressure on enterprises. This study also shows that the government's support for start-ups reduces the financing pressure of start-ups when they raise R&D funds, improves the business performance of enterprises, and has a positive significance for enterprises' sustainable and stable development. Furthermore, Li and Zhang (2012) take 95 innovative enterprises in China as the research object through empirical research and perceive that government subsidies can break the financial constraints of enterprises, and guide external financing to help enterprises overcome technical problems, thereby enhancing enterprises' innovation ability and innovation performance, and then promote the growth of new ventures. It can be seen that government subsidies have a positive significance for the growth of new ventures. Accordingly, this study proposes the following hypotheses:

H3: Government subsidies can promote the growth of entrepreneurial enterprises.

THE MEDIATING EFFECT OF GOVERNMENT SUBSIDIES

Combining H2 and H3, through incremental innovation, enterprises can achieve innovation performance and improve operation and management efficiency in a short period, which is conducive to rapid acquisition of market share and expansion of enterprise-scale so that the enterprises can meet the government subsidy assessment standards for enterprise scale, resource accumulation, technology research and development, and management level. Improving the government's recognition of entrepreneurial enterprises is beneficial, thereby increasing the probability of them obtaining government subsidies (Li & Yu, 2015; Zhu et al., 2016; Cao, 2017; Xiong et al., 2019). Entrepreneurial enterprises that receive government subsidies make up for the lack of external credit of entrepreneurial enterprises and alleviate the information asymmetry among the government, external investors and consumers towards entrepreneurial enterprises, thereby improving the social reputation and influence of entrepreneurial enterprises (Feldman & Kelley, 2006; Adegboye & Iweriebor, 2018; Yang & Zhang, 2008; Zhou et al., 2014). Meanwhile, government subsidies also enhance the confidence of external stakeholders in the enterprise and help start-up enterprises to attract external financing, which provides support and guarantees for the production, operation, and internal management of start-up enterprises, thereby promoting the growth of start-up enterprises (Yang et al., 2015; Li & Zhang, 2012). Entrepreneurs in the early stage of development have problems, such as a lack of team experience, imperfect internal organizational procedures, and insufficient internal initial resources. When carrying

out incremental innovation projects, they may face the problem of inadequate innovation resources, resulting in the inability of innovation projects to continue. In the case of government subsidies, government subsidies enhance the confidence of external stakeholders in the enterprise and guide external financing to help enterprises carry out innovation projects smoothly, which is conducive to improving the innovation ability and innovation performance of enterprises, thereby promoting the growth of enterprises. Accordingly, this study proposes the following hypothesis:

H4: Government subsidies play a mediating effect between incremental innovation and the growth of entrepreneurial enterprises.

THE MODERATING EFFECT OF MEDIA COVERAGE

Li and Xiong (2012) have shown how the media has become an information intermediary between enterprises and external stakeholders under the influence of information dissemination and reputation mechanisms and their integration. When an entrepreneurial enterprise improves, expands, or develops existing products through incremental innovation, the media can actively report the innovative information of the entrepreneurial enterprise and transmit positive signals, such as enterprise innovation information and good development prospects to the industry market, to improve the reputation of the enterprise, image, and influence (Yang & Xia, 2015; Yang et al., 2017). In particular, the Internet is widely used to disseminate and diffuse knowledge and information among the public (Lin & Ma, 2021). In China's entrepreneurship, where the State encourages mass entrepreneurship and innovation, more and more enterprises that have adopted incremental innovation have attracted the government's and the media's attention. The media usually reports on entrepreneurial enterprises' incremental innovation achievements and operation results. Yu et al. (2011) and Jiang et al. (2019) perceive that the government will consider the subsidy effect according to media information and corporate social reputation when selecting the subsidy object, which has a selection bias. Entrepreneurial enterprises often reported positively by the media are more likely to gain the trust of evaluation experts and the public's recognition. Accordingly, this study puts forward the following hypotheses:

H5: Media coverage plays a positive regulatory role between incremental innovation and government subsidies.

In summary, this study constructs a theoretical model diagram. This model puts incremental innovation, media coverage, government subsidies, and entrepreneurial enterprise growth in the same theoretical framework and answers the path and mechanism of entrepreneurial enterprises' growth based on incremental innovation, shown in Figure 1.

Figure 1.
The Theoretical model of entrepreneurial enterprise growth based on incremental innovation
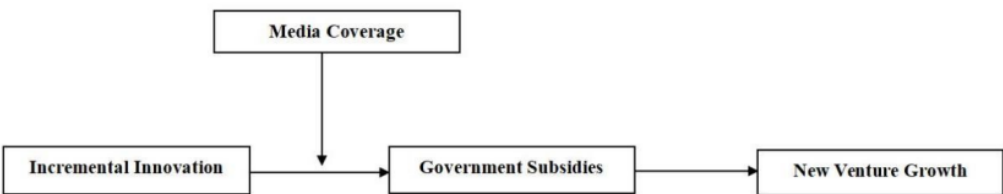
RESEARCH DESIGN AND METHODS

Research Sample

This paper takes the GEM-listed enterprises from 2009 to 2018 as the research sample. We processed the initial samples as follows. First, we excluded financial and insurance companies and ST companies. Second, the sample of enterprises with incomplete vital data, such as incremental innovation, media coverage, government subsidies, and new venture growth was excluded. Third, we recognized extreme values were present in the data, so we trimmed continuous variables' tails by 1%. 3576 data samples were obtained through preliminary screening and sample processing, and the data type was unbalanced panel data.

Variables and Measurements

Dependent Variable

Existing studies divide the measurement indicators of new venture growth into the following two categories. First, financial indicators, such as including net profit rate, gross profit rate, sales growth rate, return on assets, and return on investment (Ensley & Pearce, 2006; Feeser et al., 1990; Liu et al., 2022; Shen & Luo, 2006). Second, non-financial indicators, including employee turnover rate, employee satisfaction, market share, innovation degree, customer satisfaction, and loyalty (Kaplan & Norton, 2001; Liu, 2011; Shen, 2006). Based on the practices of Du et al. (2012) and Zhang (2020), this study adopts the "total number of employees" as the measurement index of the growth of new venture enterprises and makes logarithmic processing for it (Table 1).

Independent Variables

Existing studies mainly consider the number of patent applications of utility models and designs as the index of incremental innovation (Gong & Liu, 2022; Li, 2016; Yuan et al., 2020). Therefore, this study takes the sum of patent applications of utility models and designs as the measure index of incremental innovation.

Table 1.
Variable definition and measurement

Variable Type	Variable name	Variable Code	Definition
Dependent Variable	New Venture Growth	VG	Take the logarithm of the total number of employees.
Independent Variable	Incremental Innovation	II	Take the logarithm of [(Total number of utility model and design applications) +1]
Mediator Variable	Government Subsidies	GS	Take the logarithm of the number of direct government subsidies.
Moderator Variable	Media Coverage	MA	The sum of the total number of start-up news reports in the current year and the previous year in the Full-text Database of Important Newspapers in China is averaged.
Control Variables	Enterprise Size	SIZE	The total assets at the end of the period are logarithmic.
	Enterprise Age	AGE	Number of years of establishment
	Number of Industry Competitors	ICS	The logarithm of the total number of start-ups in the same industry
	R&D Intensity	RI	R&D investment/Total enterprise assets
	Ratio of Liabilities	LEV	Total liabilities/total assets

Mediating Variable: Government Subsidies

Government subsidies refer to the financial contribution and support to price or income provided by the government or any public institution to enterprises, including financial discount interest, incentive monetary funds, and compensatory financial funds. We usually calculate the amount of government subsidies at ten thousand yuan. To improve the data stability and eliminate the collinearity of the model, the number of government subsidies obtained by the sample enterprises in the current year should be processed by natural logarithm as the moderating variable of this study.

Moderating Variable: Media Coverage

Taking The Full-text Database of Important Newspapers in China as the data source and the year as the restriction condition, this study retreats the critical information of the full name, abbreviation, and securities code of the start-up enterprise and excludes the media reports irrelevant to the new ventures, finally obtaining the annual media coverage data of the new ventures. Given the moderating effect of media coverage on incremental innovation and government subsidies, we took the sum of data for the current year and that of the previous year as the measure index of media coverage.

Control Variables

This study draws on the practices of relevant scholars (Chen & Mu, 2018; Li & Zheng, 2016; Yang et al., 2015) and proposes to take firm size (SIZE), firm age (AGE), number of industry competitors (ICS), R&D Intensity (RI -- Research Intensity), and asset-liability ratio (LEV) as control variables. Considering the changes in industry factors and other factors in the YEAR observed by the sample enterprises, dummy variables of industry (IND) and YEAR (YEAR) will be set in this study to control the influence of industry and time on government subsidies and the growth of new ventures.

Model Construction

Incremental Innovation and New Venture Growth

According to hypothesis H1 proposed in this study, we constructed the following empirical model of incremental innovation and new venture growth:

$$\text{Model 1: } VG_{it} = C + a_1 II_{it} + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$$

Where *VG* represents the growth of new ventures, *II* represents incremental innovation, and *Controls* represents the control variables affecting the growth of new ventures. The subscript *i* means different gem enterprises, and the subscript *t* represents the different times of entrepreneurial enterprises (i.e., 2009, 2010, ..., 2018), λ_{it} is the time effect, μ_{it} is the individual fixed effect, and ε_{it} is the random error term.

Incremental Innovation and Government Subsidies

According to hypothesis H2 proposed in this study, the following empirical model of incremental innovation and government subsidies is constructed:

$$\text{Model 2: } GS_{it} = C + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$$

$$\text{Model 3: } GS_{it} = C + b_1 II_{it} + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$$

Where *GS* represents government subsidies, *II* represents incremental innovation, *Controls* represents control variables affecting the growth of entrepreneurial enterprises, and *I* represent different GEM

enterprises. The subscript *i* means different gem enterprises, and the subscript *t* represents the different times of entrepreneurial enterprises (i.e., 2009, 2010, ..., 2018), λ_{it} is the time effect, μ_{it} is the individual fixed effect, and ε_{it} is the random error term.

Government Subsidies and New Venture Growth

According to hypothesis H3 proposed in this study, the following empirical model of government subsidies and entrepreneurial growth is constructed:

Model 4: $VG_{it} = C + c_1 GS_{it} + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$

VG represents the growth of entrepreneurial enterprises, *GS* represents government subsidies, *Controls* represents the control variables affecting the growth of entrepreneurial enterprises, and subscript *I* mean different gem enterprises. The subscript *i* represents different gem enterprises, and the subscript *t* represents the different times of entrepreneurial enterprises (i.e., 2009, 2010, ..., 2018), λ_{it} is the time effect, μ_{it} is the individual fixed effect, and ε_{it} is the random error term.

The Mediating Effect of Government Subsidies

According to hypothesis H4 proposed in this study and based on Model 1, we introduced government subsidy as a mediator variable to construct the following empirical model of the mediating effect of government subsidy:

Model 5: $VG_{it} = C + a_1 II_{it} + a_2 GS_{it} + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$

VG represents the growth of entrepreneurial enterprises, *II* represents incremental innovation, *GS* represents government subsidies, and *Controls* represents the control variables affecting the growth of entrepreneurial enterprises. The subscript *i* means different gem enterprises, and the subscript *t* represents the different times of entrepreneurial enterprises (i.e., 2009, 2010, ..., 2018), λ_{it} is the time effect, μ_{it} is the individual fixed effect, and ε_{it} is the random error term.

The Moderating Effect of Media Coverage

According to hypothesis H5 proposed in this study, based on the empirical model of incremental innovation and government subsidies, we introduce media coverage as a moderating variable and construct model 6. In addition, after incremental innovation and media coverage standardization, the two interaction terms are created and incorporated into Model 6, and then model 7 is built. The following two models are empirical models to test the moderating effect of media coverage on incremental innovation and government subsidies:

Model 6: $GS_{it} = C + b_1 II_{it} + b_2 MA_{it} + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$

Model 7: $GS_{it} = C + b_1 II_{it} + b_2 MA_{it} + b_3 II_{it} * MA_{it} + \sum Controls_{it} + \lambda_{it} + \mu_{it} + \varepsilon_{it}$

GS represents the growth of entrepreneurial enterprises, *II* represents incremental innovation, *MA* represents media coverage, describes the interaction between incremental innovation and media coverage, and *Controls* represent the control variable affecting the growth of entrepreneurial enterprises. The subscript *i* means different gem enterprises, and the subscript *t* represents the different

times of entrepreneurial enterprises (i.e., 2009, 2010, ..., 2018), λ_{it} is the time effect, μ_{it} is the individual fixed effect, and ε_{it} is the random error term.

EMPIRICAL TEST AND RESULT ANALYSIS

Descriptive Statistics and Correlation Analysis

Table 2 describes the descriptive statistical characteristics of the main variables and the correlation analysis between variables. The average value and standard deviation of incremental innovation data of start-ups are 6.696 and 22.299, indicating that the degree of incremental innovation varies, and some start-ups may have innovation inertia. The average value of the growth data of new ventures is 6.832, and the standard deviation is 0.841, showing little difference in the development degree of entrepreneurial enterprises and certain similarities. According to the correlation coefficients in Table 2, there is a significant positive correlation between incremental innovation and government subsidies and new venture growth; there is a positive correlation between media coverage and government subsidies. From the control variables, enterprise size, enterprise age, asset-liability ratio, R&D intensity, and we identify the positive correlation with new venture growth.

Multicollinearity Test

This study used the variance inflation factor to test multicollinearity among variables. According to the test results in the Table 3, all variables' variance inflation factor (VIF) values are less than 10. Therefore, we identify no multicollinearity problem among the explained, explanatory, and control variables within this study and continued with the analysis.

Hypothesis Testing

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The data type used in this study is panel data, so the Hausman test is required. According to the test results in Table 4, models 1-4 are suitable for fixed-effect model regression analysis. The regression results of model 1 show that incremental innovation positively affects the growth of entrepreneurial firms($\beta = 0.0038$, $P < 0.01$). When entrepreneurial enterprises adopt the gradual innovation mode with a short R&D cycle, small and controllable risk, and less innovation investment, they should adopt the incremental innovation mode. Through the integration and utilization of existing resources, the improvement, expansion, and development of existing products can help enterprises improve

Table 2.
Mean value, standard deviation, and correlation analysis of variables

Variable	Mean	SD	II	GS	MA	VG	SIZE	AGE	LEV	RI	ICS
II	6.696	22.299	1.000								
GS	15.471	2.075	0.107***	1.000							
MA	4.379	4.987	0.123***	0.169***	1.000						
VG	6.832	0.841	0.278***	0.175***	0.170***	1.000					
SIZE	21.146	0.778	0.259***	0.193***	0.305***	0.635***	1.000				
AGE	13.522	4.785	0.006	-0.080***	-0.072***	0.102***	0.151***	1.000			
LEV	0.275	0.165	0.160***	0.031	0.167***	0.385***	0.460***	0.135***	1.000		
RI	0.028	0.020	0.049***	0.105***	-0.042**	0.141***	-0.119***	0.057***	-0.092***	1.000	
ICS	3.652	1.227	0.061***	0.042**	-0.128***	-0.005	-0.076***	0.017	-0.097***	0.298***	1.000

Note: ***p<0.01, **p<0.05, *p<0.1

Table 3.
Multicollinearity test results

Variable	Tolerance	VIF
II	0.917	1.09
GS	0.917	1.09
MA	0.870	1.15
VG	0.524	1.91
SIZE	0.662	1.51
AGE	0.935	1.07
LEV	0.775	1.29
RI	0.877	1.14
ICS	0.893	1.12

operational efficiency and short-term performance, obtain capital, technology, and other asset and knowledge resources, to optimize the internal operation and management of enterprises and promote the growth of entrepreneurial enterprises. Therefore, hypothesis H1 is verified.

The regression results of model 3 show that incremental innovation has a significant positive impact on government subsidies ($\beta = 0.0044$, $P < 0.01$). Enterprises need to undergo strict professional review before obtaining government subsidies, and they also need to undergo regular audits and professional

Table 4.
Incremental innovation, government subsidies, and new venture growth

Variable	Model 1 VG	Model 2 GS	Model 3 GS	Model 4 VG
Constant	-6.8284*** (-16.89)	1.5733 (1.55)	2.1939***(2.12)	-7.3822***(-23.71)
II	0.0038***(7.72)		0.0044***(2.82)	
GS				0.0128**(2.49)
SIZE	0.6291***(11.56)	0.6756***(13.81)	0.6441***(12.84)	0.6451***(41.82)
AGE	-0.0032***(-3.85)	-0.0513***(-7.21)	-0.0504***(-7.08)	-0.0027(-1.23)
LEV	0.6620***(15.48)	-0.6978***(-3.04)	-0.7356***(-3.21)	0.6665***(9.45)
RI	6.5576***(3.99)	13.6369***(7.70)	13.3043***(7.50)	9.5394***(17.38)
ICS	0.0010*** (7.47)	0.0321***(1.12)	0.0268(0.93)	-0.0104(-1.18)
IND	control	control	control	control
YEAR	control	control	control	control
P	0.000	0.000	0.000	0.000
F	42.82	54.69	46.99	518.97
Adj-R2	0.4350	0.0698	0.0717	0.4650
N	3576	3576	3576	3576
FE	Yes	Yes	Yes	Yes
Hausman Test	15.30***	84.00***	82.25***	21.63***

Note: ***p<0.01, **p<0.05, *p<0.1

assessments after receiving government subsidies. This undoubtedly enhances the government and external investors' understanding and trust in the enterprise and alleviates the information asymmetry between the government, external investors, and consumers towards entrepreneurial enterprises. Through incremental innovation, enterprises can achieve innovation performance and improve operation and management efficiency in a short period, which is conducive to rapid acquisition of market share and expansion of enterprise-scale so that enterprises can meet the government subsidy assessment standards for enterprise scale, resource accumulation, technology research and development, and management level. Improving the government's recognition of entrepreneurial enterprises is beneficial, thereby increasing the probability of them obtaining government subsidies. Therefore, hypothesis H2 is verified.

The regression results of model 4 show that government subsidies significantly promote new venture growth ($\beta = 0.0128$, $P < 0.05$). Government subsidies serve as an "invisible credit guarantee" for start-ups, giving them a strong reputation, credibility, and reliability. In the case of information asymmetry, it helps start-up enterprises attract external financing and provides support and guarantee for their production, operation, and internal management. At the same time, acquiring government subsidies and external funding can alleviate the innovative financing dilemma of entrepreneurial enterprises, encourage enterprises to develop new products, invest in high-value innovative projects, cultivate the core competitive advantages of enterprises, and promote the growth of entrepreneurial enterprises. Hypothesis H3 is verified.

Testing the Mediating Effect of Government Subsidies

Based on Model 1, we introduce government subsidy as a mediator variable (Table 5). The regression results of Model 5 show that incremental innovation still has a significant positive impact on new venture growth ($\beta = 0.0037$, $P < 0.01$). We also note how government subsidies still promote new venture growth ($\beta = 0.0002$, $P < 0.01$), but the coefficient of incremental innovation decreases from

Table 5.
The mediating effect of government subsidies

Variable	Model 5
Constant	-6.9892***(-21.92)
II	0.0037*** (28.13)
GS	0.0002***(3.30)
SIZE	0.6344***(41.10)
AGE	-0.0030(-1.39)
LEV	0.6370***(9.10)
RI	9.4964***(17.55)
ICS	-0.0159*(-1.82)
IND	control
YEAR	control
P	0.000
F	461.94
Adj-R2	0.4744
N	3576
FE	Yes
Hausman Test	14.99***

Note: ***p<0.01, **p<0.05, *p<0.1

0.0038 to 0.0037. The decrease shows that government subsidies partially intermediates between incremental innovation and new venture growth. Hypothesis H4 has been verified.

Testing the Moderating Effect of Media Coverage

Based on Model 3, we introduced media coverage as a moderating variable, and the regression results in Table 6 for Model 6 show a significant positive correlation between media coverage and government subsidies ($\beta = 0.0467$, $P < 0.01$). According to media governance theory and signal transmission theory, media becomes the information intermediary between enterprises and external stakeholders due to the information asymmetry between enterprises and external stakeholders. When the government selects the subsidy object, it will consider its subsidy effectiveness according to the media information and social reputation, which has a particular selection bias and makes it easier for enterprises to obtain government subsidies. The regression results of model 7 show that the interaction terms of incremental innovation and media coverage have a significant positive impact on government subsidies ($\beta = 0.0028$, $P < 0.01$). Media coverage plays a positive moderating role between incremental innovation and government subsidies. Hypothesis H5 is verified.

Robustness Test

This study tested the robustness of the empirical model by changing the measurement method of explained variables. The primary business income growth rate replaces the measurement index of new venture growth, and we carried a series of regression tests out on relevant models (Table 7). The test results are consistent with the empirical conclusions of the above models.

Table 6.
The moderating effect of media coverage

Variable	Model 6 GS	Model 7 GS
Constant	3.7064*** (3.52)	3.4742*** (14.27)
II	0.0039** (2.51)	0.0029*** (8.70)
MA	0.0467*** (6.57)	0.0258*** (18.15)
II*MA		0.0028*** (2.89)
SIZE	0.5569*** (6.57)	0.5799*** (4.89)
AGE	-0.0445*** (-6.24)	-0.0329*** (-18.95)
LEV	-0.7833*** (-3.43)	-0.4347*** (-7.93)
RI	12.9097*** (7.32)	8.0623*** (21.49)
ICS	0.0484* (1.69)	0.0017*** (14.27)
IND	control	control
YEAR	control	control
P	0.000	0.000
F	46.92	53.32
Adj-R2	0.0825	0.1184
N	3576	3576
FE	Yes	Yes
Hausman Test	68.27***	68.77***

Note: ***p<0.01, **p<0.05, *p<0.1

Table 7.
Robustness Tests

Variable	Model 8 VG	Model 9 VG	Model 10 VG	Model 11 VG
Constant	-0.9623*** (-12.37)	-0.9775*** (-12.51)	-1.0259*** (-12.79)	-0.9275*** (-11.44)
II			0.0003***(2.67)	0.0011*** (6.97)
GS		0.0045** (2.15)	0.0048** (2.30)	0.0039** (1.92)
II*MA				0.0001*** (7.96)
SIZE	0.0679*** (17.98)	0.0654*** (16.47)	0.0676*** (16.66)	0.0634*** (15.53)
AGE	-0.0142*** (-24.84)	-0.0140*** (-24.44)	-0.0141*** (-24.54)	-0.0138*** (-23.98)
LEV	0.1428*** (7.95)	0.1443***(8.03)	0.1478*** (8.20)	0.1419*** (7.87)
RI	0.1279*** (1.04)	0.1636*** (-1.32)	-0.1565 (-1.26)	-0.1923 (-1.55)
ICS	-0.0001* (-1.65)	-0.0001*** (-12.51)	-0.0001 (-1.59)	-0.0001 (-1.05))
IND	control	control	control	control
YEAR	control	control	control	control
P	0.000	0.000	0.000	0.000
F	220.39	184.45	159.15	147.49
Adj-R2	0.037	0.038	0.0383	0.0404
FE	Yes	Yes	Yes	Yes
Hausman Test	183.95***	207.31***	205.04***	207.66***

Note: ***p<0.01, **p<0.05, *p<0.1

CONCLUSION AND IMPLICATIONS

Research Conclusions and Theoretical Contributions

Based on the data of listed companies on ChiNext from 2009 to 2018, this paper empirically analyzes the mechanism of incremental innovation, government subsidies, and new venture growth. In addition, it examines the role of media coverage in the relationship between incremental innovation of entrepreneurial enterprises and government subsidies. Finally, it provides empirical evidence at the micro-enterprise level to understand the inherent logic in the incremental innovation-government subsidy-new venture growth chain. The research conclusions are as follows.

First, incremental innovation has a significant positive impact on government subsidies and new venture growth. Entrepreneurs integrate and use existing resources through incremental innovation and improve, expand, and develop current products, which is conducive to helping enterprises improve operational efficiency and short-term performance, optimize internal operations and management, and promote new venture growth. When the government selects subsidy objects, it will consider the resource accumulation, technology research and development, and enterprise management level to evaluate its performance in implementing the innovation subsidy policy. Through incremental innovation, enterprises can achieve innovative performance and improve operation and management efficiency quickly, which is conducive to quickly gaining market share and expanding enterprise scale. Sending positive signals such as good development prospects and a good social reputation in the market is conducive to improving the government's recognition of entrepreneurial enterprises, increasing the probability of entrepreneurial enterprises obtaining government subsidies.

Second, government subsidies have a significant role in promoting new venture growth. From the past development experience of countries worldwide, many countries have guided and

promoted the development of specific industries through government subsidies (Chen et al., 2021). Government subsidies serve as "invisible credit guarantees" for start-ups, giving them an excellent reputation, credibility, and reliability. Because of the information gap between enterprises and external stakeholders, the government's credit guarantee can help start-up enterprises attract external financing, provide support and guarantee for start-up enterprises' production, operation, and internal management, and promote new venture growth.

Third, government subsidies mediate between incremental innovation and new venture growth. In incremental innovation, capital, technology, and other asset resources often constrain new ventures because of the uncertainty of the development prospects of entrepreneurial enterprises. Start-ups obtaining government subsidies can send positive signals such as government recognition, good development prospects, and a good reputation in the industry market to help start-ups attract external financing. Government subsidies and external funding can ease the innovative financing dilemma of entrepreneurial enterprises, encourage enterprises to develop new products, invest in high-value creative projects, cultivate the core competitive advantages of enterprises, and promote the growth of entrepreneurial enterprises.

Fourth, further research finds that media coverage positively moderates incremental innovation and government subsidies. As an information intermediary between enterprises and external stakeholders, the media's information disclosure and dissemination of entrepreneurial enterprises can directly affect the investment decisions of external stakeholders. When an entrepreneurial enterprise improves, expands, or develops existing products through incremental innovation, the media can transmit positive signals such as enterprise innovation information and good development prospects for the industry market, enhancing the enterprise's reputation, image, and influence. When the government selects subsidy objects, it will consider factors such as subsidy effectiveness based on media information and social standing. Furthermore, the government has a selection bias, making it easier for enterprises to get government subsidies.

The theoretical contribution of this study is to expand the research scope of the new venture growth theory. From the perspective of progressive innovation, this study combines resource-based theory, signal transmission theory, government intervention theory, and entrepreneurial growth theory to clarify how incremental innovation affects new venture growth through government subsidies and to explore the role of media coverage between incremental innovation and government subsidies. In addition, this study provides a new research perspective and explanation path for the study of incremental innovation and new venture growth and enriches the theoretical research results in entrepreneurial growth.

Management Implications and Research Limitations

China's main technological and model innovation force is small and medium-sized enterprises, entrepreneurial enterprises, and scientific and technological innovation enterprises. The conclusions of this study have specific enlightenment significance for promoting the efficient growth of new ventures. First, for new ventures with scarce resources, on the one hand, it is necessary to strengthen innovation management by focusing on the comprehensive utilization of limited internal and external resources and quickly accumulating technology and developing products at a small cost. On the other hand, new ventures can first choose incremental innovation with less risk in combination with the actual situation and then rush to high-quality innovation with a higher threshold. Second, for the government departments, it is necessary to pay attention to the growth cycle of entrepreneurial enterprises, accelerate the improvement of innovation and entrepreneurship policies, implement different innovation subsidy policies in stages and categories, and support entrepreneurial enterprises to carry out continuous small and micro innovations. Enterprises emphasize the quality of re-innovation, and they can restrict the rent-seeking behavior and free-riding behavior of entrepreneurial enterprises by signing quality-assured contracts for innovation subsidies. As for the media, it should always adhere

to truthful and objective reporting, actively disclose the incremental innovation information of new ventures, and help them improve their social reputation and market recognition.

We can identify several limitations of this study within the following aspects. First, there is a lack of questionnaires, surveys, and analyses of GEM-listed enterprises. The sample data of this study mainly comes from relevant databases and enterprises' annual reports. Because of the limitations of the information publicly disclosed by listed companies, future research needs to design a questionnaire to obtain the data of GEM listed companies through a questionnaire survey and to make up for the lack of public information on listed companies. Second, the period of the data for China's GEM-listed companies is relatively short. Compared with the main board enterprises, new ventures officially launched into the growth enterprise market lag behind, leading to a relatively brief development time. Therefore, it is necessary to carry out a longitudinal study on the impact mechanism of incremental innovation on the future growth of new ventures. Third, this study only discusses the moderating effect of media attention in China's entrepreneurship context. In China's entrepreneurship context, new ventures with high media coverage are more likely to gain recognition, trust, and support from the government, external investors, and consumers. Future studies could further explore the moderating effect of media coverage in entrepreneurship in other countries.

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