



Department of Management Chair Corporate Strategy

**Mediating effects of Top Management Team(TMT) Pay between Degree of
Internationalization (DOI) and MNC Performance:
Empirical evidence from High-tech industry in China**

SUPERVISOR
Prof. ZATTONI ALESSANDRO

CANDIDATE SHAOSHUAI ZHANG
Student Reg. No. 700691

CO-SUPERVISOR
Prof. BOCCARDELLI PAOLO

ACADEMIC YEAR 2017-2018

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摘要

随着当今全球化趋势的不断增强，越来越多来自发展中国家的企业逐渐走上了世界舞台，成为全新一代的跨国企业。而中国的高新科技企业正是这股时代浪潮中的典型代表。

本次研究致力于以更加实证的视角探索目前中国高新科技行业的国际化现状。我们创新性地从团队层面切入这一全球化现象，同时将高管团队薪酬作为中介变量引入到理论模型之中。

相应地，我们提出三层研究问题：（1）在中国高新科技行业中，跨国企业国际化程度与绩效之间是否存在怎样的因果关系？（2）高管团队薪酬在这层关系中又扮演了怎样的角色？（3）除了主模型中的变量以外，是否还存在其他因素会同时影响跨国企业绩效？

为了检验研究假设，我们收集了覆盖 120 家已公开上市的中国高新科技企业的样本，同时梳理其 3 年周期内的运营指标数据。因此，本次研究样本总量为 360，包括一手数据和二手数据两种来源。在此基础上，我们采用了 STATA 回归分析的方法对 2013-2015 年国家化程度数据和 2014-2016 年跨国企业绩效进行回归分析处理；此外，三个高管薪酬相关的变量作为中介变量被分别引入到主效应模型中进行进一步研究。

基于实证数据的结果论证了：假设 1-- 跨国企业绩效与其国际化程度存在显著负向的联系；假设 2——高管团队年薪可以负向中介主效应模型中的因果关系；假设 3——高管团队长期股权激励可以负向中介主效应模型中的因果关系。然而，以 CEO-高管团队薪酬差作为中介变量的模型并不存在充分显著性的回归联系。

接下来，我们基于回归结果对不同主题进行了深入的探讨，以将理论结果与商业实际紧密结合起来。此外，本次研究所存在的局限性也被列出，用于启发未来的研究者。最后，我们从国际化进程相关的不同利益相关者角度出发提出了相应的管理启示，并以此结束全文。

高管团队：高管团队， 国际化程度， 跨国企业绩效， 高新产业

Abstract

As the trend of globalization is rapidly intensifying nowadays, more and more companies from developing countries come to the world stage, becoming a new generation of MNCs. The high-tech companies from China are the typical examples of this new global wave.

This study dedicates to investigate into the internationalization conditions in China high-tech industry from an empirical-based perspective. We innovatively penetrate into the phenomenon from a team level and introduce TMT pay as mediators into the theoretical models.

Accordingly, we put forward three levels of research questions: (1) What's the relationship between degree of internationalization and MNC performance in China high-tech industry? (2) What effects will TMT pay cast on the relationship between degree of internationalization and MNC performance in China high-tech industry? (3) Are there any other factors, which can also influence MNC performance at the same time, besides the main variables in the model?

To test our hypotheses, we collect a sample of 120 Chinese high-tech companies with their three-year operation data, from both first-hand sources and second-hand sources. The regression method is adopted to analyze the causality between Degree of Internationalization (DOI) of 2013-2015 and MNC performance of 2014-2016. In addition, three independent mediators, related to TMT pay, are introduced to the main model to conduct further investigation.

The final results from empirical data validated: Hypothesis 1-- MNC's performance is negatively associated with its degree of internationalization; Hypothesis 2a-- annual compensation of TMT will negatively mediate the relationship between degree of Internationalization and MNC Performance; Hypothesis 2b--long-term incentive pay of TMT will negatively mediate the relationship between degree of Internationalization and MNC Performance. However, the model mediated by CEO-TMT pay gap doesn't show adequate significant evidence.

Afterwards, we make in-depth discussions about different issues related to the regression results, to connect academic achievements with business practices. What's more, the limitations of this study are also listed to inspire the future researchers. In the end, we summarize the thesis with managerial implications for different stakeholders towards MNC internationalization.

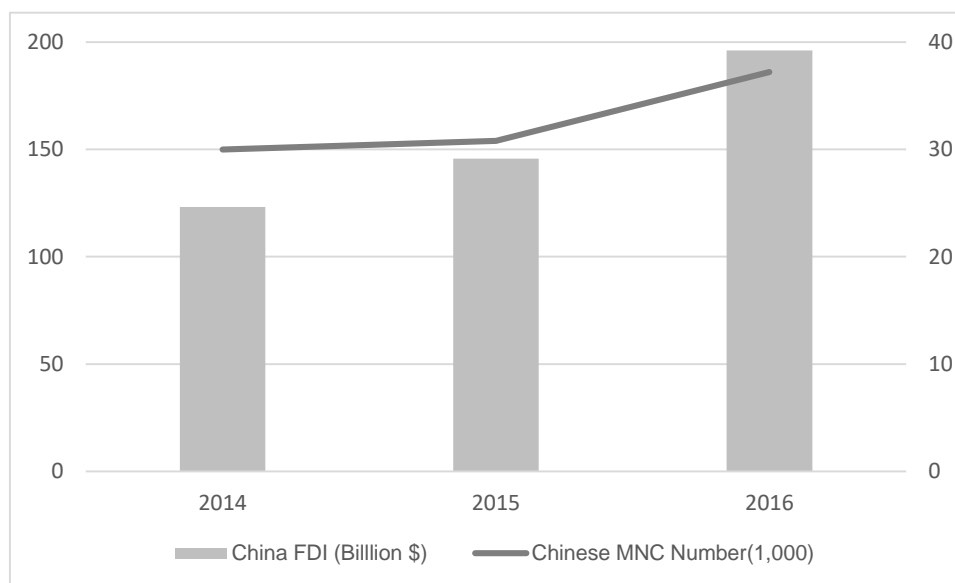
Key words: Top Management Team(TMT), Degree of Internationalization (DOI), MNC Performance, High-tech industry

1 Introduction

1.1 Research Background

Since the Chinese Economic Reform and Open Up in 1987, China has been one of the most attractive recipient land of investment all over the world. Nevertheless, what's noteworthy is that China has exceeded Japan as the world No.2 global investor since 2015. During the same year, the outward invest of China surpassed its inward invest, with 18.3% year-on-year growth which reached the new record historically.

Table 1. Statistics of China FDI & MNC Number 2014-2016¹



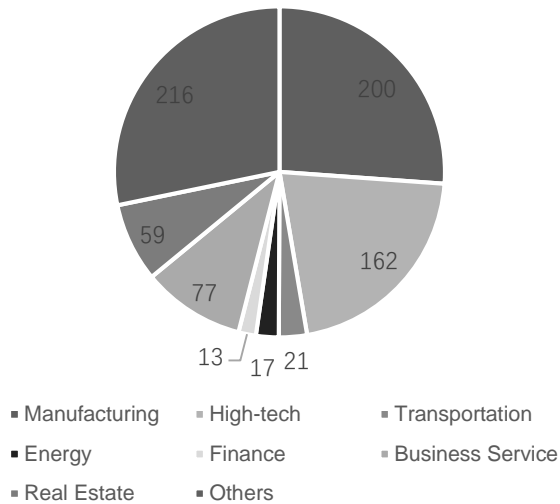
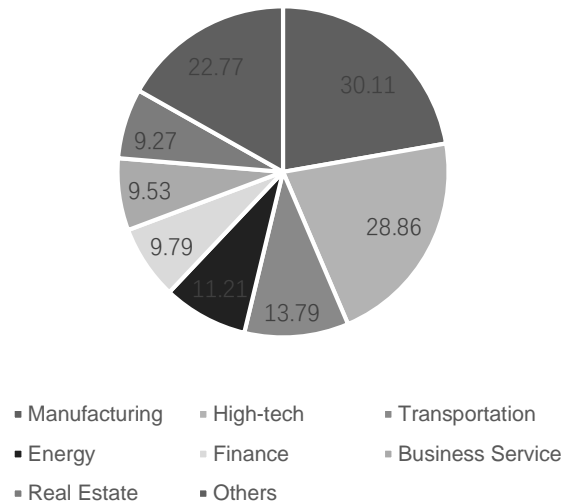
Source: Ministry of Commerce of the People's Republic of China

In 2016, cross-border merger and acquisition projects led by Chinese MNCs are quite frequent. According to the *2016 Statistical bulletin of China's Outward Foreign Direct Investment (FDI)* released by Ministry of Commerce of the People's Republic of China, the number of M&A, in terms of both project number and project value, reached the historical peak. The former number of total project is 765 and the latter number of total project value is \$135.33 billion.

The M&A projects mentioned above cover 18 different industry categories. As illustrated in the tables 2 below, the number of projects led by China high-tech companies occupies the second place among all the industries, only lagging behind the manufacturing industry by 38. What's more, high-tech industry also ranks the 2nd based on the project value, which accounts for 28.86% of the national total. Combining the data results with macro business environments, there goes without saying that MNCs from China high-tech industry are playing a more and more prominent role in the development of national economics.

¹ 2016 年度中国对外直接投资统计公报(<http://www.fdi.gov.cn/CorpSvc/Temp/T3/Product.aspx?idInfo=10000499&idCorp=1800000121&iproject=33&record=9229>)

Table 2. China Overseas M&A Project Number

Table 3. China Overseas M&A Project Value²

Source: Ministry of Commerce of the People's Republic of China

1.2 Research Motivations

Despite its important position in the development of national economy, there have been few researches focusing on high-tech industry in China so far. As more and more Chinese high-tech companies choose to enter different foreign markets, relevant theoretical models also need further enrichment to provide academic guidance and inspirations for internationalization operations.

Currently, we have few insights into this emerging industry: How is the average level of internationalization from an industry perspective? What effects has internationalization brought to MNCs in terms of performance? Are there any other factors affecting internationalization strategy execution?

All these questions seem blank and mysterious based on the existing literature of internationalization; thus, this thesis aims at implementing an in-depth investigation into China high-tech industry to explore the internationalization issue in a comprehensive way.

1.3 Research Findings

Accordingly, we raise the following research questions, which need further investigations and tests, in the following parts:

(1) What's the relationship between degree of internationalization and MNC performance in China high-tech industry? With the increase of internationalization level, such as larger number of foreign countries

² 2016 年度中国对外直接投资统计公报(<http://www.fdi.gov.cn/CorpSvc/Temp/T3/Product.aspx?idInfo=10000499&idCorp=1800000121&iproject=33&record=9229>)

entered or higher percentage of revenue from overseas markets, will it bring about more integrated synergies and larger sales volume, or more potential risks and higher operating costs?

(2) What effects will TMT pay cast on the relationship between degree of internationalization and MNC performance in China high-tech industry? TMT members are the core composition of corporate governance system, the level of their incentive has significant influences on organization performance. Hence, if provided with various kinds of incentive measures, in terms of pay, what kinds of new outcomes will be introduced to the model?

(3) Are there any other factors, which can also influence MNC performance, besides the main variables in the model? We take firm size as control variable to see the moderating effects of some internal factors.

To implement the study, we collect data of 360 samples, which include 120 Chinese publicly listed high-tech companies and their three-year operation data, with one-year time gap between independent variable and dependent variable.

After the regression analysis, the data demonstrates that MNC's performance is negatively associated with its degree of internationalization (DOI) in China high-tech industry. What's more, two mediators, TMT annual compensation and TMT long-term incentive pay will weaken the connection in the main effect. And TMT pay gap doesn't show any significant mediating effects in the model while firm size impacts MNC performance in a positive way.

1.4 Research Discussions

Our study successfully strengthens our understandings about internationalization strategy in China high-tech industry through regression analysis and case analysis. This thesis contributes to the existing literature on internationalization of MNC in three aspects:

(1) Our study provides adequate empirical evidence to support the negative relationship between degree of internationalization (DOI) and MNC performance in China high-tech industry. This thesis fills in an academic gap in the existing literature, as the research, for the first time, deepens into such a specific industry to pursue insights. Contrary to common belief, financial performance will significantly worsen down with the increase in the degree of internationalization.

(2) Our study penetrates into corporate governance from a team level, rather than an individual level. The past researches attach more importance to the role of CEO, while this thesis justifies TMT members' value in a convincing way. According the regression data, the results prove that TMT members are totally capable of improving the organizational performance. With the maturing of corporate governance theory, team-based

views are more sufficient to explain the new trends.

(3) Our study innovatively introduces pay as mediators into the theoretical models. The past researches usually tend to set pay as independent variable, dependent variable or control variable. Nevertheless, this thesis amplifies the incentive effects of TMT pay, which works effectively to explain the mechanism between degree of internationalization (DOI) and MNC performance. The results subtly connect the execution of corporate strategy with internal corporate governance, leaving great inspirations and much exploration space for future researchers.

2 Literature Review

2.1 High-tech Industry

The word ‘High-tech’ (abbreviated from high technology) can date back to the article from ‘*The New York Time*’ in 1958, which mentioned "... *Western Europe, with its dense population and its high technology*"[1]. With time going on, this emerging concept has been endowed with more specific and up-to-date meanings. According to the book *Technology and International Trade* published by US National Academy of Science in 1977, it is defined as ‘*the cutting-edge technologies which are built on theories of modern techniques and natural science*’; Furthermore, it can bring significant economic, social and environmental benefits. Currently, ‘High-tech’ is widely recognized as technologies at the cutting edge, which are most advanced (Joseph & Heike, 2001).

In China, the government has established official definitions for High-tech companies. According to the ‘*Administrative Measures for the Determination of High and New Technology Enterprises*’³ jointly released by national Ministry of Science and Technology, Ministry of Finance and State Administration of Taxation in 2016, they refer to the industry-based companies which have: 1.over one-year registration period; 2.independent ownership of the intellectual property; 3.high innovation capability; 4.most advanced technologies which are advocated by the governments.

High-tech industries in China mainly include three typical examples-- information technology, biotechnology and new material technology. Overall, they mostly share some similar characteristics:

(1) High proportion of R&D expenditure to the gross output value: in the high-tech industries, most corporate resources, such as finance and talent are devoted to technology research and development, to realize unique comparative advantages distinguished from other competitors.

(2) High risk and high yield: due to the heavy R&D invest which has the potential risk of turning into sunk cost, and the low survival rate, high-tech companies will lose the last penny if they misunderstand the market trend or customer preference. On the contrary, if they succeed, there is no doubt that the companies can dominate their positions in the market as fast-movers .

(3) Long investment cycle: Although high-tech industry enjoys high growth capacity, they also face relatively long investment cycle. Generally, it will take roughly 3-7 years to establish a brand, develop mature technology and go to the market.

³ <http://www.innocom.gov.cn/gxjsqyrdw/xxtg/201602/30ad62f5a4e044bcad68e13223bc48d0.shtml>

2.2 Multinational Company and Internationalization

2.2.1 Introduction of Multinational Company

Multinational companies (MNC) are the corporate organizations which owns or controls the production or sales of goods and services in at least one country besides its own home country (Voorhees R, 1992). One of the most famous multinational companies throughout the history is the Dutch East India Company which was the world's first formally listed public company and once set up the business center abroad.

Nowadays, foreign direct investment (FDI) tend to be the main channel for domestic companies to go international; some specific approaches primarily include 'Merger and Acquisition'(M&A) and Greenfield Investment (Wang M, Wong M, 2009). Comparatively, Greenfield investment will bring more benefits in independent ownership control, but meanwhile takes a longer investment cycle. Mullen (2007) finds that the level of competitiveness in the host market can affect firms' entry decision as well. The choice between M&A and Greenfield has been recognized as a highly dynamic and contingent process so far.

2.2.2 Development History of MNC

Throughout the business history, we can divide the development of multinational companies into four main phases (Wang, 2012):

(1) 1850-1914: The emergence of MNCs

After the appearance of the Honorable East India Company, many western governments were aware of the tremendous benefits that multinational companies could bring back to home country. With the development of Second Industrial Revolution, the invention of new transportation and communication facility significantly reduced the operation costs for companies. More and more western players joined in the fierce competition for the global market share.

(2) 1918-1939: MNCs and western imperialism

During the end of nineteenth century and early twentieth century, United states, Britain, France, Germany, Japan and Russia all have stepped into the stage of imperialism. Multinational companies, such as *Rio Tinto Limited* & *Billiton Limited*, have become the most important channel between home country and colonies. However, the outbreak of the second world war heavily slowed down the expansion of these western giants in overseas markets.

(3) 1945-1960s: Rapid growth and global presence of MNCs

After the Second World War, the focus of governments targets at economic progresses again. Old multinational giants were trying to occupy more markets while newcomers were also ready to confront the competition.

Some typical new multinational companies during that period include Toyota and Goldman Sachs. At the same time, appearances of marine container, global airline and new communication technology have further promoted the development of multinational companies.

(4)1960s-now: MNCs from developing countries coming to the global stage

In this new period, the most obvious change is the emergence of multinational companies which originated from developing countries, despite the huge gap lagged behind the western old giants. Taking China as an example, after the Economic Reform and Open up in 1978, many Chinese companies, such as Huawei, Haier and Lenovo have gone to global market for new opportunities.

2.2.3 Definition of Internationalization

For the moment, there hasn't been established the widely agreed definition for 'Internationalization' in the field of strategy management. Vernon (1966), based on product cycle theory, points out that the degree of internationalization increases as product export evolves into capital or technology export with the development of product life cycle. Johanson and Vahlne (1978), emphasize that internationalization is a consistent process in which the companies gradually increase their international involvement according to company behaviors in business operations. The concept extends as the research goes further and deeper. Annavarjula (2000) measures the internationalization of a firm in terms of three dimensions: overseas operations, overseas asset ownership and international orientation in management style, strategy & organization structure.

There are many kinds of motivation of determinants, explaining why hundreds of companies would like to take huge risks to compete in a totally unfamiliar market. As illustrated in the table 4 below, many researchers have successfully proved the significantly positive relationship between internationalization and related performance, value and innovation capacity. The prosperous and promising results, both financial and strategic, are encouraging more and more domestic companies to go international.

Table 4. Main researches on the motivations and determinants of internationalization

Independent Variables	Dependent variables	Authors and Researchers
Internationalization	Firm performance	Sullivan, 1994; Nielsen, 2010
	Firm Value	Kogut, 1983; Tsetsekos, 2010
	Innovation Capacity	Kobrin 1976; Salomon & Shaver, 2005; 李平, 田朔, 2010

2.2.4 Measurement of Internationalization -- Degree of Internationalization (DOI)

To measure internationalization in a quantitative way, the concept, Degree of Internationalization (DOI), is put forward. Despite the limited measures of the visible phenomenon of internationalization, it's essential to choose measures based on conceptual reasoning rather than data availability. Currently, there are three main methods to quantify DOI:

(1) Single dimension & single index

Grant (1987) adopts the ratio of foreign sales to total sales(FSTS) to quantify the DOI of British manufacturing companies. Daniels and Bracker (1989) further introduce the ratio of foreign assets to total assets (FATA) into the model. Afterwards, more single dimensions, such as the ratio of foreign employees to total employees(FETE) (Lu & Beamish, 2001) and the number of oversea subsidiaries(NOS) (Morck & Yeung, 1993) are chosen as by researchers for the same purpose, implying that both the depth and breadth are crucial in measuring this variable.

(2) Multi dimensions & aggregated indexes

The most typical method of multi dimensions & aggregated indexes was designed by Sullivan (1994). The degree of internationalization (DOI INTS) is computed as follows:

$$DOI = FSTS + FATA + OSTs + TMIE + PDIO$$

His article *Measure the Degree of Internationalization of a Firm* released by Journal of International Business Studies finds it difficult to reflect the multi-dimensional characteristic of internationalization with only single dimension. It suggests that the DOI of a firm has three attributes: 1.performance perspective; 2.structural perspective; 3.attitudinal perspective. Hence, he adopts five variables, including the ratio of foreign sales to total sales (FSTS), the ratio of foreign assets to total assets (FATA), proportion of overseas subsidiaries to total subsidiaries (OSTS), top managers' international experience (TMIE), and psychic dispersion of international operations (PDIO).

(3) Multi dimensions & multi indexes

In 2003, Goerzen and Beamish were the first to raise the assumption that it may seem confined to define internationalization dimensions with only one index; instead, they introduce two main dimensions to measure - international asset dispersion and country environment diversity, which both consist of different indexes.

2.3 Top Management Team and TMT Compensation

2.3.1 Introduction of Top Management Team (TMT)

The concept, Top Management Team, originates from the Upper Echelons Theory of Hambrick and Mason (1984). A top management team (TMT) is a specific form of team where the members typically consist of some of the top managers, such as vice president and finance manager, in the company (West, 2005). In China, *LAW of Corporation, Article 217*, regulates that top management personnel include general manager, vice manager, chief finance officer, board secretary from listed companies and other employees based on company regulations.

Senior managers exert a significant impact on the organization operations, and as a result of its strong connection with company performance, related topics, such as leadership, and TMT composition, have always been the center of attention by many scholars. These researches not only focus on the characteristics of every single member, but try to gain insights from the team level as well.

Table 5. Main academic domains about Top Management Team(TMT)

Domains	Topics	Authors and Researchers
TMT characteristics	TMT Demography & Background	Eagly & Johnson, 1990; Slater & Dixon, 2010.
	TMT Heterogeneity	Jason, 1989; Pelled, 1996; Tony, 1999.
TMT behaviors	TMT Behavior Integration	Simsek, 2005; 姚振华&孙海法, 2009.
	TMT Interaction	O'Reilly, 1993; Smith, 1994.
	TMT Conflict	Jehn, 1994; Amason & Mooney, 1999; Tompson, 1999.
TMT Compensation	TMT Compensation Gap	Henderson & Fredrickson, 2001; Carpenter & Sanders, 2004.
	TMT Compensation Inequity	Adams, 1963; Linder & Tyler, 1988.
	TMT Compensation Structure	Rosen, 1992; Sudharka, 2006.
TMT Leadership	Collectivistic leadership	Triandis, 1995; Carson & Tesluk, 2007.
	Shared Leadership	Cannon & Salas, 2001; Scoot & Caress, 2005.

2.3.2 Discussion about TMT Compensation

A new highlight about TMT theory in the recent years is TMT compensation due to the emergence and popularity of new compensation forms applied into employee management system. Related compensation theory of top management team is built on the basis of Human Capital Theory, which emphasizes the value of human (Schultz, 1961). Becker (1962) argues that employees, especially those with high-level skills, have reasonable rights to ask for appropriate part of the retained earnings from employers.

Milkovich & Newman (2002) classify different forms of compensation from employers into four categories, which include: 1.basic wage—the basic return that companies offer for TMT members' work and contribution; 2.performance bonus—extra bonus for TMT's outstanding performance; 3.ownership of stock—one important incentive method that enables TMT members involved in the sharing of residual earnings; 4.employee benefits—different types of services and materials provided by employers, including medical insurance, future pension plan and paid maternity leave etc. From the perspectives of TMT members, we can further summarize the most important and effective types-- one type is cash pay, which usually takes the form of annual salary, covering basic part and performance part; and the other is long-term incentive pay, in the form of stock option. Comparatively, cash pay is less risky and more prudent, but the potential future benefits of incentive stock can be also very attractive to those managers who are confident in making progresses in the organization level (Sanders, 2001).

2.4 MNC Performance

MNCs play an essential role in the international business development. As noted in the past, the sales volume of top 500 MNCs in 1981 contributed to over 20% of the world's gross domestic product and over 80% of FDI (Rugman, 1987). Hence, many articles and papers in recent years are trying to figure out the working mechanism behind the desired outcomes. With the maturing of performance theory, more related topics have sprung up due to the development and changes of global business environments

Table 6. Main academic domains about Corporate Performance

Research Domains	Research Topics	Authors and Researchers
Overall evaluation of corporate performance	Three-dimension evaluation model	Lee, Kwak & Han, 1995
	Hierarchical evaluation model based on TOPSIS method	Feng & Wang, 2000
	Evaluation model based on DEA & SNA	Lin & Tan, 2013
Corporate performance evaluation on Sustainability	SERS for small-and-medium companies	Perrini & Tencati, 2006
	Evaluation indexes about sustainability evaluation	Chvatalova, 2012
	Literature review of sustainability performance evaluation	Goyal & Rahman, 2013
Corporate CSR performance research	Relationship between product evaluation & CSR performance	Perera & Chaminda, 2012
	CSR performance research in fund industry	Das & Rao, 2013
Corporate performance measurement	Performance measurement based on PCA & DEA	Fu & Ou, 2013
	Performance measurement based on balanced Score Card	Franceschini, 2013

Currently, researchers have established different dimensions and indexes to measure organizational performance, as it tends to be the ultimate dependent variable in different academic fields. In term of MNC, these measure methods can be directly applied as well. Actually, organizational performance consists of three specific types of firm outcomes: 1.financial performance, such as ROA, ROE and EPS; 2.product market performance, such as sales volume, market share and survival; 3.shareholder return, such as added value (Richard & Devinney, 2009). Single, multiple or aggregate measures are widely adopted in the literature based on the indexes above. In the first case, researchers use only single dimension based on specific theory. Accounting index is the most common and readily available way to realize this objective. For example, Gerpott and Jakopin (2005) chooses the index of ratio of earnings before interest to measure the performance of different MNC samples in European mobile operator industry. In the second case, researchers use different dimensions to describe performance. Lee (1995) points out that it is essential to comprehensively adopt financial and non-financial dimensions to evaluate the overall performance of companies. In the third case, researchers aggregate dependent variables with different dimensions, assuming the convergent validity based on the correlation among the different measures (Cho & Pucik, 2005).

3 Hypothesis Development

3.1 Degree of Internationalization (DOI) and MNC Performance

There are already plenty of discussions explaining the relationship between degree of internationalization (DOI) and MNC performance. Mainstream opinions are illustrated as below:

(1) Positive relationship between DOI and MNC Performance

The most traditional and common opinion about internationalization is that the higher degree of internationalization that MNCs present, the better performance they will realize in the future. Many classic researches in early time have shown abundant evidence to support this conclusion. The samples of 304 British manufacturing companies by Grant (1987), 192 American manufacturing companies by Tallman(1996) and 399 Japanese manufacturing companies by Delios (1999) all show that degree of internationalization will impact performance positively. The phenomenon not only applies to MNCs of large scale, but exists widely among small-and-medium-sized MNCs as well (Pangarkar , 2008).

There are many theories accounting for the principles of the positive relationship. 1.FDI theory—Dunning (1977) explains MNCs' advantages in ownership, location and internationalization, lead to the success of multinational operations, compared with domestic companies by OLI paradigm; 2.Organization learning theory-- Johanson and Vahlne (1977) raise that internationalization is a progressive process, during which MNCs can learn totally new knowledge through foreign market operations. This kind of new knowledge mainly consist of general internationalization knowledge and market-specific knowledge; 3.Resource-based view theory—Caves(2007) holds the view that internationalization is a great opportunity for MNCs to access and integrate global resources, further shaping the capacity of efficient resource allocation.

(2) Negative relationship between DOI and MNC Performance

However, some scholars hold the opposite view about the relationship between degree of internationalization and MNC performance, instead they insist that degree of internationalization will impact performance negatively. The first objector is Collins (1990). He collects and analyzes data from three groups of American firms: ones without significant international operations, ones with international operations in developed countries, and ones with international operations in developing countries. The ultimate findings show that developing country with higher level of DOI contribute to inferior performance, but that there are no statistically significant differences in market performance among the three groups. Denis's research (2002) also proves the negative linear relationship between MNC stock market value and degree of internationalization.

To understand the reasons about the negative links between these two variables, we need to introduce two

concepts ‘Liability of Newness’ and ‘Liability of Foreignness’, implying that MNCs face various kinds of disadvantages and challenges as a newcomer in different foreign markets (Hymer & Stephen, 1976). Organization learning theory also supports this conclusion from a different perspective. Barkema and Pennings (1996) find that the complication of internationalization will increase significantly with the expansion of geographical distribution and cultural diversification, hence enhancing financial costs and operation risks for MNCs.

(3) U-shaped relationship between DOI and MNC Performance

Sullivan’s findings (1994), based on seven industry data of 75 American MNCs during 1988-1990, lay an important foundation for U-relationship between DOI and MNC Performance, which implies that the performance will decline in the beginning phase of internationalization until they have accumulated adequate experience. Lu and Beamish (2001) also further confirm the conclusion based on the evidence from international SMEs.

We can interpret the phenomenon in this way that the increase of internationalization in the primary phase will result in the decline of performance due to liability of newness and foreignness; after MNCs learn progressively from market heterogeneity and gain enough local knowledge, the performance will recover effectively. What’s more, the economy of scale will also help as a whole, with more presence all over the world.

(4) Inverted U-shaped relationship between DOI and MNC Performance

Another popular opinion related to the relationship between degree of internationalization and MNC performance besides ‘Positive’ is ‘Inverted U Shape’. Hitt and Hoskisson (1997) carry out a large-scale investigation, covering 295 American MNCs and lasting 3 years. The ultimate data results suggest that firm performance is initially positive but eventually levels off, even becoming negative as internationalization degree increases. Ramaswamy (1995) observes the inverted U-shape relationship based on his drug and pharmaceutical industry research as well.

Main mechanism to explain inverted U-shape relationship is ‘Transaction Cost Theory’ brought up by Coase (1988). When it comes to MNCs, the transaction costs will increase gradually after internationalization complication accumulates, in terms of inefficiency of resource allocation, culture diversity, excess information processing, etc. In the beginning, the complication level is relatively low, the new market will provide MNCs with great performance potential. Nevertheless, as MNC headquarter sets up more subsidiaries globally, the organization will face much more uncertainty and risks afterwards, declining the overall performance.

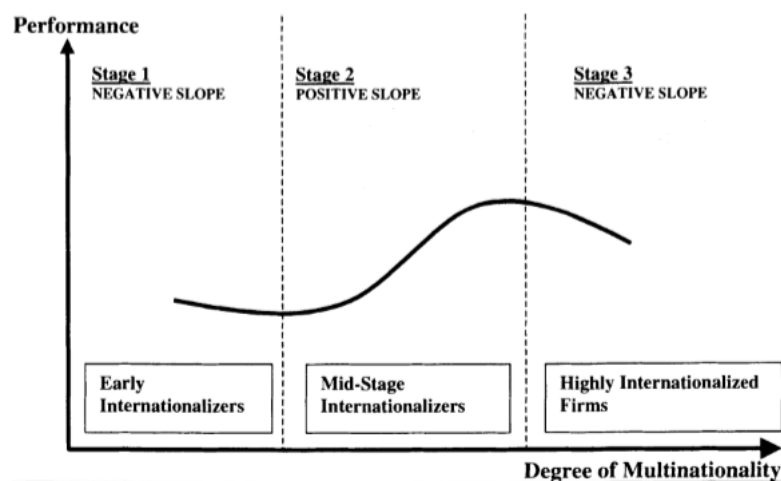
(5) S-shaped relationship between DOI and MNC Performance

In recent years, more empirical evidences have reflected the S-shaped relationship between DOI and MNC Performance. Nielsen (2010) investigates into 165 Swiss listed companies and found the non-linear cube relationship between TMT internationalization and related performance, rather than a simple linear causality.

(6) N-shaped relationship between DOI and MNC Performance

Another up-to-date finding for the past few years is the N-shaped relationship between DOI and MNC Performance. Contractor, Kundu and Hsu (2003) collect data of 103 MNCs in 11 service industries from different countries. They find the three-stage model between DOI and MNC Performance: Stage 1—negative slope due to the liability of foreignness and initial learning costs; Stage 2—positive slope due to economies of scale and resource augmentation; Stage 3—negative slope due to culture distance and coordination costs.

Graph 1. Three-stage Model



As a whole, the MNCs from China high-tech industry are relatively young and most of them were established around year 2000, implying that they only have around 20-year-long domestic operation experience. What's more, the turbulent wave of internationalization in China primarily took place around 2008-2010; Thus, we can assume that the current situation in China high-tech industry applies more to the negative relationship assumption as mentioned above.

Hypothesis 1: In China high-tech industry, a MNC's performance is negatively associated with its degree of internationalization (DOI).

3.2 Top Management Team(TMT) Pay between Degree of Internationalization (DOI) and MNC Performance

Multinational operations make serious claims upon MNCs on its capacity of corporate governance in that they will face more complicated decision-making situations in terms of totally heterogeneous cultural, institutional and market environments. Accordingly, the higher degree of internationalization or diversification a company

appears, the higher compensation the senior managers should be rewarded (Henderson & Fredrickson, 1996). This phenomenon is also reflected in the background of China in light of the empirical evidences from listed companies in Shanghai and Shenzhen stock markets (Xue & Han, 2007).

However, in terms of organization, more academic attention is targeted at CEO, with inadequate focus on TMT members, as most executive-compensation research is directed primarily at the CEO (Carpenter & Sanders, 2002). Shifting the research lens from the only top leader to the level of the TMT allows us to investigate into the mechanism from team level. To better understand what is inside the black box, we introduce two famous theories to explain:

(1) Information-processing theory

Information-processing theory originates from psychology and applies to organization management based on Contingency Theory. We view the organization as a large-scale information processing system which gathers, interprets, and synthesizes all kinds of information related to organizational decision-making processes (Tushman & Nadler, 2014). With the rise of entries into more foreign countries, MNCs will face more diverse market environments; in turn, TMT members need to deal with information of larger size and more complexity. The heavier burden, hence, increases information processing demands from senior managers (Sanders & Carpenter, 1998).

(2) Agency theory

Agency theory was primarily talking about risk sharing (Wilson, 1968) and was broadened to the relationship between the principal and the agent, aiming at improving the efficiency of the organization (Eisenhardt, 1989). With the further penetration into global markets, the needs of senior executives, equipped with market-specific and professional knowledge are urgent. Senior executives, especially those working in the oversea subsidiaries, serve as the agents for the MNCs to cope with the foreign market uncertainty and risks. They are strictly selected and disciplined to guarantee the smooth operations abroad.

Taking these two theories together, we can conclude that the increase in degree of internationalization will bring about more complexity in organization governance, thus stimulating the overall information-processing and agency demands to institute more efficient governance arrangements (Finkelstein & Hambrick, 1996). Based on this, the high complexity and high requirements of multi-national operations for TMT members need to be remedied with appropriate compensation levels. Further, the positive relationship between degree of internationalization and pay level of TMT members have been supported by tremendous empirical evidences. What's more, organizations, like MNCs, usually distribute incentive measures to members in order to induce them to contribute to intended activities, according to 'Incentive Theory' (Clark & Wilson, 1961). Main types of incentives include: 1. material-- tangible rewards which mostly have monetary value; 2. solidary-- intangible

rewards which derive mainly from the acts of organizations; 3.purposive-- intangible rewards which derive mainly from the stated end. For example, Employee compensations are the most common form in terms of material incentives. From the perspective of Content-Based Incentive Theory, employee compensations not only fulfill psysiological needs and safety needs of low hierarchy, but play an important role in esteem needs and self-actulization needs of high hierarchy as well (Maslow, 1954). The incentive effects of compensations on TMT members are reflected in the overall organizational performance as they are decision-making center of whole organization which leads the strategic direction. Whereas, employees not merely compare salaries to their past numbers, but with other internal members, especially those similar to themselves, as well. Based on the Equity Theory (Adams, 1965), large pay gap will cast significantly negative effects on employees' job performance (Bloom & Michel, 2002).

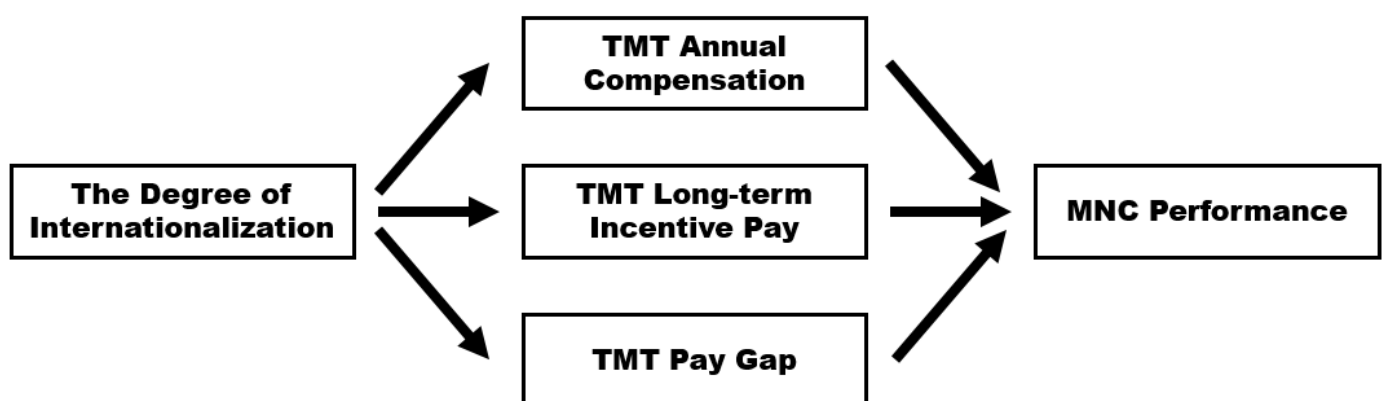
Accordingly, we put forward the following hypotheses:

Hypothesis 2a: In China high-tech industry, annual compensation of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Hypothesis 2b: In China high-tech industry, long-term incentive pay of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Hypothesis 2c: In China high-tech industry, the pay gap between CEO and TMT will positively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Graph 2. Theoretical Model



4 Research Method

4.1 Sample and Data Sources

The research objects are all selected from the high-tech industry in China, including information technology, biotechnology and new material technology, these three sub-industries. Among them, we target at all the companies publicly listed in Shenzhen & Shanghai Stock market which conduct business in more than one country besides their own home countries. By filtrating according to the three requirements below: 1.High-tech industry; 2.Internationally operated; 3.Publicly listed, the sample number of companies finally stops at 120 after deleting some of the invalid groups. This study also adopts time-series factors into consideration to implement internal comparisons, so for each company, we choose all data between 2013 and 2016. In summary, the sample size is 360.

The data collection method consists mainly of two source:

(1) First-hand Data

First-hand data includes: *Independent Variable—Degree of Internationalization (DOI)*, *Mediating Variable—TMT Annual Compensation*, *Mediating Variable—TMT Long-term Incentive Pay* and *Mediating Variable—CEO-TMT Pay Gap*. All data comes from the annual reports of 120 companies from 2013 to 2015

(2) Second-hand Data

Second-hand Data includes: *Dependent Variable—MNC Performance* and *Control Variable—Firm Size*. All data comes from *TongHuaShun*, a famous internet finance platform. The time period ranges from 2014 to 2016.

The data set is typical panel data, which is composed of time series data and cross-section data matrix.

To cope with panel data, we use STATA 12.0 to run regression analysis. As a result of the huge differences among various companies, the potential existence of cross section heteroscedasticity may bring about serial correlation. Accordingly, Fixed Effects Model(FE) is introduced to avoid the disadvantages of Ordinary Least Square Method(OSL).

4.2 Variable Measurement

Independent Variable—Degree of Internationalization (DOI):

Due to the lack in availability of certain data and limited exposure from annual reports, it's very difficult to adopt multi-dimensional method to measure degree of internationalization (DOI). For example, the number of foreign employees and monetary value of overseas assets are not mentioned in many organizational annual

reports. Thus, we adopt the ratio of foreign sales to total sales(FSTS) to measure DOI (Grant, 1987).

The specific formula is illustrated as below:

$$DOI = 1 - \text{Domestic Revenue/Total Revenue}$$

Mediator 1—TMT Annual Compensation:

In the academic context of China, Xue and Han (2007) choose the sum of top three senior managers' compensations on behalf of overall payment of TMT. Obviously, this method seems too narrow to represent the whole TMT members. Wei (2000) introduces the logarithm of sum of all the TMT members' compensations. However, this new act also ignores the influence of TMT size, which amplifies the causality effect if the team size is very large. Based on the above, we use the average of TMT members' annual salary.

The specific formula is illustrated as below:

$$TMT \text{ Annual Compensation} = \text{Sum of Every TMT Member's Annual Salary/Number of TMT Members}$$

Mediator 2—TMT Long-term Incentive Pay:

The measurement of TMT long-term incentive pay is based on the number of stock option which the company reward for their job performance in the end of different years. To eliminate the effects of the difference among different company situations, we bring in the total number of publicly listed stock into the measurement (Carpenter & Sanders, 2004).

The specific formula is illustrated as below:

$$TMT \text{ Long-term Incentive Pay} = \text{Sum of Every TMT Member's Sock Option/Number of Total Stock Option}$$

Mediator 3—CEO-TMT Pay Gap:

Henderson and Fredrickson (2001) use the natural logarithm of the difference between CEO compensation and the average of the total compensation paid to top four members of the TMT to measure CEO-TMT Pay Gap. This study basically follows their example, apart from that, we adopt average of the whole team for TMT pay level rather than top four members, to keep consistency with measurement method above.

The specific formula is illustrated as below:

$$TMT \text{ Pay Gap} = CEO \text{ Annual Compensation} - TMT \text{ Annual Compensation}$$

Dependent Variable—MNC Performance:

In consideration of the characteristics of panel data, it's necessary to set a significant time gap between independent variables and dependent variables. In this study, we assume that DOI of this year will influence the company performance of next year, thus, the time gap is one year. Amongst the past researches, financial performance data is most widely used to measure the overall company performance, such as ROE (Chang &

Gong, 2012), ROA (Carpenter & Sanders, 2002), EPS (Lin & Pantzalis, 2009) or Tobin's Q (Mehran, 1995). Considering that the sample companies are all publicly listed, this study chooses EPS as the measurement of MNC performance from all the return-related indexes.

Control Variable—Firm Size:

Firm size plays a very significant role in senior manager compensations (Finkelstein & Hambrick, 1996) and has been a typical indicator of company's financial performance (Nielsen, 2010). What's more, a larger-scale company also exhibit higher DOI (Thomas & Eden, 2004). To eliminate external effects out of the main model, it's chosen as the control variable and we use a logarithmic function in order to meet normal distributions requirements.

The specific formula is illustrated as below:

$$\text{Firm Size} = \ln(\text{Total asset of the company})$$

5 Results and Analysis

For this part, we will present with the data results after Stata regression analysis of different models with three independent mediators-- TMT Annual Compensation, TMT Long-term Incentive Pay and TMT Pay Gap. The FE model method is adopted and the details are as below:

5.1 Descriptive Statistics

Table 7 reveals the descriptive statistics of main variables in the theoretical model. The difference of DOI among different MNCs in high-tech industry varies significantly from one company to another, ranging between 0 and 93.83. The average degree of internationalization is around 18.6.

In regard to TMT annual compensation, we use the logarithmic function to leverage the average of the whole team. So, as a matter of fact, the mean number of TMT annual salary on an industry level is 470,452.5 RMB; the min number is 17,600 RMB and the max number is 2,574,723 RMB. Next is TMT long-term incentive pay, namely stock option. Generally speaking, the ratio of TMT's stock option to company stock option is relatively low in China high-tech industry. We can see that the average ratio is only around 0.01%, implying this incentive measure hasn't been widely applied for senior managers in many high-tech companies. After that, it's obvious that CEOs generally gain higher compensations than TMT members and the average gap between these two reaches up to 75,666 RMB every year.

With respects to dependent variable, earning per share ranges from -0.96 to 2.73 in the whole industry and the average index is around 0.456, which is also a positive but modest number.

The last one is the control variable—firm size. We also use the logarithmic function before processing. Hence, the actual mean corporate total asset is RMB 3,083,697.74; the actual max corporate total asset is RMB 74,344,088,677.

Table 7. Descriptive Statistics of Variables

Variables	Obs	Mean	Std. Dev	Min	Max
DOI	360	18.60831	23.44404	0	93.87
TMT Annual Compensation	360	3.85111	0.668981	0.5653138	5.550912
TMT Long-term Incentive Pay	360	0.0102621	0.0288199	0	0.170997
TMT Pay Gap	360	7.566612	0.4018371	0	7.771067
EPS	360	0.4556583	0.5300638	-0.96	2.73

Firm Size	360	21.91045	1.212282	14.94164	25.03197
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5.2 Correlation Coefficients

Table 8 lists all the correlation coefficients between different variables.

First of all, let's focus on the correlation between DOI and EPS and coefficient is -0.1527, showing the significant correlation between the independent variable and dependent variable. What's more, the relationship is also negative, which supports our assumption about Hypothesis 1 in an indirect way.

In addition, the correlation coefficient between DOI and TMT Annual Compensation is -0.0347; the correlation coefficient between DOI and TMT Long-term Incentive Pay is -0.0435; the correlation coefficient between DOI and TMT Pay Gap is 0.0205. Although all the results are not significant, but the role of mediators in the model functions just as the way that we expect.

Table 8. Correlation Coefficients among Variables

	DOI	TMT Annual Compensation	TMT Long-term Incentive Pay	TMT Pay Gap	EPS	Firm Size
DOI	1.0000					
TMT Annual Compensation	-0.0347	1.0000				
TMT Long-term Incentive Pay	-0.0435	0.0175	1.0000			
TMT Pay Gap	0.0205	-0.1733*	0.0179	1.0000		
EPS	-0.1527*	0.2929*	0.1028*	0.0028	1.0000	
Firm Size	0.0025	0.5395*	-0.0346	0.0581	0.2051*	1.0000

5.3 Regression Model

In table 9, we put all the regression results together. Above all, let's first focus on the model 1 of main effect. The coefficient of regression between DOI and EPS is -0.002 and the T-test value is -2.218, which are not only significant on the level of 0.05, but also negative. The results show great support for Hypothesis 1: MNC's performance is negatively associated with its degree of internationalization (DOI). That's to say, in the China high-tech industry, the more countries that a company enters, or the higher percentage that overseas asset accounts for, the worse performance that the company shows in the end of year instead. Accordingly, Hypothesis 1 is completely validated. The moderating effect of firm size is also perfectly significant on the level of 0.01. The positive value reflects that if a MNC has a larger asset scale, they will present better

performance outcomes.

Furthermore, the three models mediated by three pay-related variables are relatively independent; thus we will analyze the data results separately in the following parts:

(1) Model 2a—Mediated by TMT Annual Compensation

In the first model, the regression coefficient of mediator 1-- TMT Annual Compensation, is 0.808, which is perfectly significant on the level of 0.01. Besides, the regression coefficient of interaction term of 'DOI*TMT Annual Compensation' is 0.013, which is perfectly significant on the level of 0.01. And the T-test value is 2.811. The results provide valid proof for Hypothesis 2a and the positive value goes just as predicted that annual compensation of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance. Given that, we can say that Hypothesis 2a is perfectly validated, implying that if a company offers TMT members higher average annual compensations, the negative relationship between DOI and performance will weaken down. What's more, the moderating effect of firm size isn't significant on any level, so the control variable casts no influence in Model 2a.

(2) Model 2b—Mediated by TMT Long-term Incentive Pay

In the second model, the regression coefficient of mediator 2-- TMT Long-term Incentive Pay, is 1.352, which is comparatively significant on the level of 0.05. Besides, the regression coefficient of interaction term of 'DOI* TMT Long-term Incentive Pay' is 0.108, which is comparatively significant on the level of 0.05. And the T-test value is 2.421. The results provide valid proof for Hypothesis 2b and the positive value goes just as predicted that long-term incentive pay of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance. Given that, we can say that Hypothesis 2b is completely validated, implying that if a company offers TMT members higher percentage of stock options, the negative relationship between DOI and performance will weaken down. What's more, the moderating effect of firm size is perfectly significant on the level of 0.01, so the control variable casts a positive influence on MNC performance.

(3) Model 2c—Mediated by TMT Pay Gap

In the third model, the regression coefficient of mediator 3-- TMT Pay Gap, is 0.5, which is barely significant on any level. Besides, the regression coefficient of interaction term of 'DOI* TMT Pay Gap' is -0.02, which is barely significant on any level, either. And the T-test value is -0.998. The results provide inadequate proof for Hypothesis 2c that the pay gap between CEO and TMT will mediate positively the relationship between degree of Internationalization (DOI) and MNC Performance, although the negative value goes just as predicted. Given that, we can say that Hypothesis 2c isn't successfully validated.

Table 9. Regression Model of Three Models

	EPS	EPS	EPS	EPS	EPS	EPS
DOI	-0.002** (-2.218)	-0.002** (-2.129)	-0.002** (-2.326)	-0.002** (-2.003)	-0.004*** (-3.584)	0.154 (0.987)
TMT Annual Compensation	0.391*** (3.900)			0.808*** (5.073)		
TMT Long-term Incentive Pay		1.761*** (2.598)			1.352** (2.311)	
TMT Pay Gap			0.109 (0.214)			0.500 (0.853)
DOI*TMT Annual Compensation				0.013*** (2.811)		
DOI*TMT Long-term Incentive Pay					0.108** (2.421)	
DOI*TMT Annual Compensation						-0.020 (-0.998)
Firm Size	0.050*** (2.678)	0.085*** (5.257)	0.084*** (5.084)	0.038 (1.466)	0.094*** (4.234)	0.084*** (5.065)
Cons	-0.829** (-2.151)	-1.449*** (-4.094)	-2.238 (-0.594)	-0.661 (-1.220)	-1.540*** (-3.163)	-5.211 (-1.185)
N	360	360	360	360	360	360
R-square	0.130	0.098	0.088	0.129	0.091	0.089

5.4 Summary of Data Results

In the fourth chapter, we put forward the following assumptions based on the past literature materials and our own theoretical models:

Hypothesis 1: In China high-tech industry, a MNC's performance is negatively associated with its degree of internationalization (DOI).

Hypothesis 2a: In China high-tech industry, annual compensation of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Hypothesis 2b: In China high-tech industry, long-term incentive pay of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Hypothesis 2c: In China high-tech industry, the pay gap between CEO and TMT will positively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

After the data processing with Stata and related regression analysis, the results show that Hypothesis 1, Hypothesis 2a and Hypothesis 2b have been well validated, signifying that in China high-tech industry, MNC with higher degree of internationalization turn out to make worse performance; Meanwhile, this negative

relationship is significantly mediated by TMT pay-related factors, which means, if TMT members are provided with higher annual salary and higher stock options, to certain extent their efforts will help improve the organization performance despite that the company is highly international. What's more, firm size can also moderate the dependent variable in that the larger scale or more asset a MNC has, the better the company will perform, compared with those small peers.

6 Case Analysis

We have raised theoretical models and made regression analysis from an industry level, which helps us gain macro insights about internationalization status quo among China high-tech MNCs. To obtain better understandings about internationalization from different perspectives, it's essential to take one typical MNC as example to conduct a case study, penetrating into more micro details. Therefore, we will further analyze the internationalization processes of ZTE Corporation in this section, to uncover the authentic business conditions inside the organization.

6.1 Company Introduction

ZTE Corporation is a famous Chinese multinational telecommunication equipment and system company headquartered in Shenzhen, Guangdong.⁴ The main business units consist of three aspects: 1. carrier networks, including access, exchange, optical transmission, wireless and data telecommunications gear; 2. terminals, including mobile phones; 3. telecommunication, including telecommunications software. It is not only a global product and service provider, but undertakes OEM business as well. ZTE has the most complete telecommunications product line in this industry, covering every vertical sector of wireless networks, core networks, access & bearer networks, services and terminals markets.

Table 10. Revenue Composition Divided by Business Units

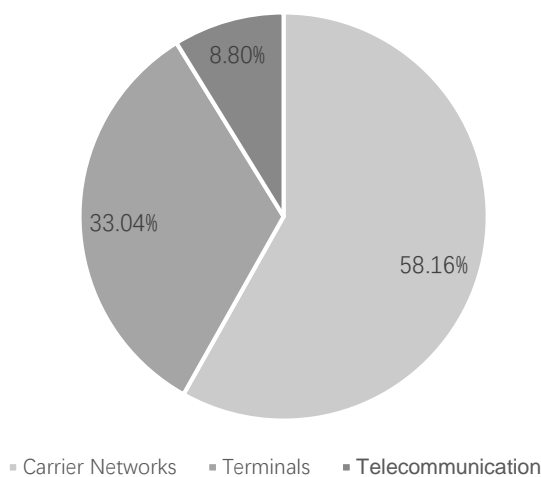
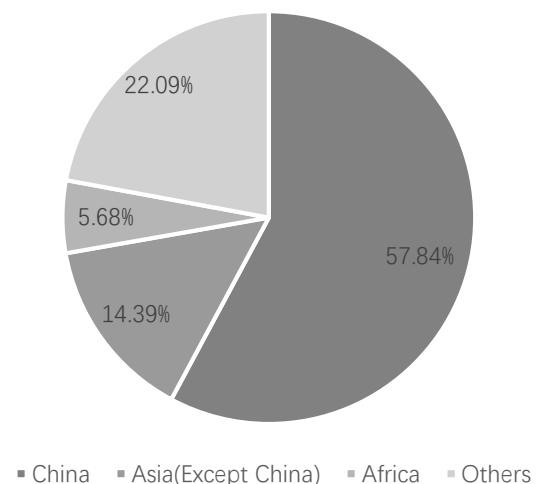


Table 11. Revenue Composition Divided by Geography⁵



Within the organization, there's a common consensus, called "three decades", which is used to summarized the development history of ZTE:

⁴ <https://en.wikipedia.org/wiki/ZTE>

⁵ 2016 ZTE Annual Report

(1) The first decade 1985-1994: ZTE clarified its unique development strategy in the industry that it will insist on independent research and development in telecommunication technology; and made preliminary progresses in China rural market;

(2) The second decade 1995-2004: ZTE started to pursue an internationalization strategy and achieved great breakthroughs after taking the leading position in domestic market;

(3) The third decade 2005-2014: ZTE became a competitive global player in telecommunication industry and ranked as world class telecommunication manufacturer; so far, it has successfully implemented ‘Rural market - Urban market – global market’ three-step development strategy.

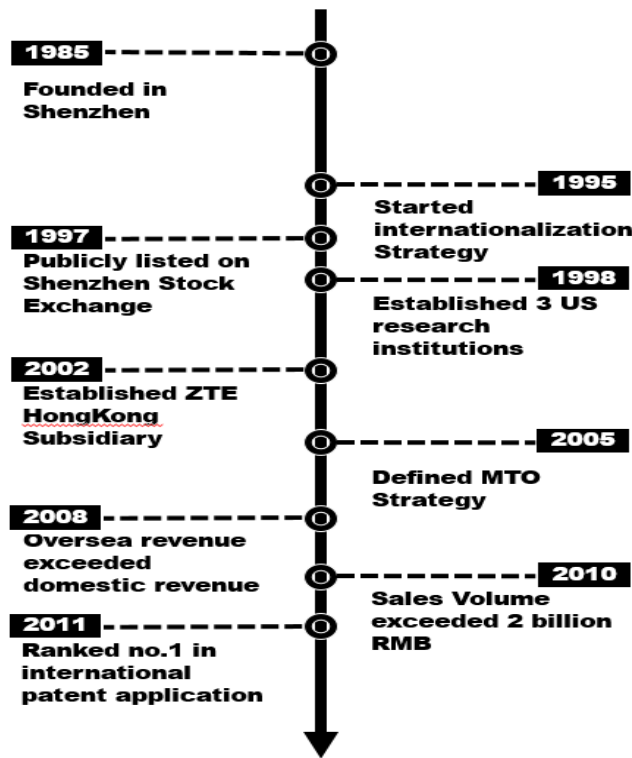
6.2 Historical Development of ZTE Internationalization

ZTE has been constantly committed to offering end-to-end products and services to deliver excellence and value to consumers, operators and business organizations from over 160 countries around the world to enable increased productivity and connectivity.⁶

After founded in 1985, ZTE has been trying to enter different foreign counties, expanding its business scope. The telecommunication industry is one of first markets in China that opens to foreign investors in the 1990s; thus fierce competition among domestic players and western giants, such as Nokia, Cisco and Ericsson, speeded up the business war over new markets. What’s more, for this kind of high-tech companies, the fixed cost of new technology, such R&D invest, can be a heavy burden for organization finance capacity; while, the variable cost is significantly low, in light of the existing technology. Therefore, it’s highly beneficial to promote scale of economy if companies can sell as many products or offer as much service as possible globally. All these factors above motivate ZTE to pursue an internalization strategy from the beginning.

⁶ http://www.zte.com.cn/global/about/corporate_information

Graph 3. Brief Historical Development History of ZTE



In general, we can divide the internationalization processes of ZTE into five phases according to the milestone events taking place over history:

(1) Phase 1: 1995-1997 Exploration in developing countries

1995 is the beginning of internationalization strategy as ZTE joined in ITU (International Telecommunication Union) in Genova. At that time, ZTE also ensured its dominant position to lead in China domestic market, with more focus on the oversea markets.

However, due to the strong presence of giant telecommunication companies from developed countries, such as Ericsson and Alcatel, what was left in the global market for ZTE is only some underdeveloped countries. Lacking independent and advanced telecommunication technology, ZTE targeted at some developing countries in the beginning where western players' concentration ratios is relatively low. Its main business activities included exporting products to Indonesia, Malaysia and some African countries, on a small scale. In spite of various limitations in organization capacity and innovation capability, ZTE still tried to set up some small subsidiaries to explore the market characteristics of foreign countries; for example, in 1996, ZTE successfully bid for the switch project in Bangladesh, with total contracting rights.

(2) Phase 2: 1998-2001 Preparations for future expansion

After continuous trial and error in developing countries, ZTE thought that it was time to turn into an authentic global player from 1998. During this period, ZTE was capable of exporting mature communication system

equipments to global markets; what's more noteworthy is that it started to participate into projects of network infrastructure construction in certain countries. To strengthen its market position, ZTE set up over 20 sales and after-sales offices in foreign markets; resulting from these efforts, the overseas sales reached up to 3 billion RMB in 1999. It is a giant step for this emerging company as the breakthroughs were reflected not only in the increase of number of foreign countries entered, but in the expanding organization technology capability as well.

(3) Phase 3: 2002-2004 Accelerating to penetrate deeper

After the preparations in the primary stage, ZTE was clearly aware of the economic benefits of internationalization as the earnings of some global deals are several times higher than the domestic ones. Therefore, ZTE comprehensively improved its inputs into overseas markets from different aspects, including capital, talent and other resources. Fortunately, its efforts paid off in this period. By the end of 2004, ZTE set up over 50 foreign representative offices and its business scope covered over 70 countries, consisting of not only developing countries, like Pakistan and Vietnam, but developed markets, like Hong Kong, America and Cyprus as well. Especially in Africa, ZTE formed strategic partnership with national telecommunication companies and made a great figure in these emerging markets. What's more, the successful entries into some high-potential markets, such as Brazil, Russia and India, also provide strong confidence for this organization's long-term development.

(4) Phase 4: 2005-2009 Yin's robust strategy

Similar to other Chinese companies, the main comparative advantage of ZTE lies in the low cost, implying that the revenue of ZTE mainly came from low-end product, low-end clients and low-end markets. To promote a sustainable development in global markets, Yimin Yin, then-CEO of ZTE, set year 2005 as 'the year of internationalization' and put forward a robust expansion plan— 'cash flow first, revenue second, scale third'. Yin consistently followed the ZTE's robustness orientation and took three important measures to support the front-line projects in overseas markets:

1. Different marketing divisions worldwide were integrated in a systematic way. Among that, division II, which used to take charge of domestic markets, and division III got merged together. And top management team decided to increase resource inputs to strengthen operational capacity of three divisions, responsible for overseas markets.
2. In 2007, ZTE transferred the organization structure from division system to matrix structure, which is composed of marketing, R&D, production, etc.
3. A new budget system was implemented to guarantee the quality of large-scale turkey projects. The specific management method changed from simple expenditure budget to comprehensive operating budget, which took

more factors into consideration.

(5) Phase 5 2010-2016 Shi's aggressive strategy

After Lirong Shi became the new CEO of ZTE, his ambition to shorten the distance with main competitors and to break further into western markets was getting more and more evident. Despite the depression in the global markets, resulting from European debt crisis and Brexit, an aggressive strategy was already in process. Many R&D engineers from headquarter were reassigned as sales representatives to serve for big telecom operators in Europe.

Table 12. ZTE's Main Cooperation Project with Western Operators

Cooperation Period	Partner Operator	Contract Standard
2010-2011	Austria Hi3G	HSPA+/LTE
2010-2012	Germany E-plus	HSPA+/LTE
2010-2012	Belgium KPN	HSPA+
2010-2012	Portugal Optimus	GSM/UMTS/HSPA+
2010-2012	Hungary	GSM/UMTS/HSPA+/LTE
2011-2012	Sweden	LTE FDD/TDD

However, the rapid increase of global market share in western countries didn't successfully convert into the desired profits. On the contrary, the expansion in scale massively consumed the capacity of ZTE's limited cash flow. In 2012, ZTE reported its full-year loss at 2.84 billion RMB.

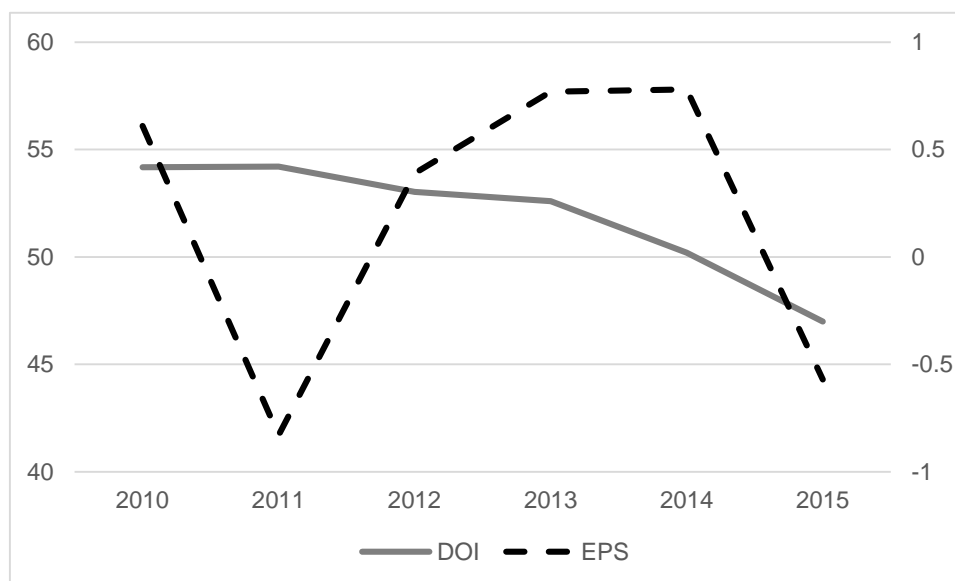
6.3 Case Analysis

After reviewing ZTE's history of internationalization in a qualitative way, in this part, we would like to analyze the nature of internationalization development from a more quantized perspective. Accordingly, we collect all the data about degree of internationalization and MNC performance from 2010 to 2015. To be consistent with the research method mentioned before, degree of internationalization is still measured by *Overseas Revenue/Total Revenue*; and MNC performance is still measured by *EPS*.

As illustrated in the table below, DOI for ZTE in 2010 is 54.18%, in 2011 is 54.21%, in 2012 is 53.03%, in 2013 is 52.60%, in 2014 is 50.20%, and in 2015 46.99%. The changing trend of this factor goes up slightly in 2010 and declines rapidly year by year. At the same time, EPS for ZTE in 2010 is 0.61, in 2011 is -0.83 in 2012 is 0.39, in 2013 is 0.77, in 2014 is 0.78, and in 2015 is -0.57. On the contrary, this factor decreases

significantly in the beginning and starts to grow gradually after 2011. Although EPS in 2015 goes down distinctly, overall, we can say that degree of internationalization and MNC performance changes in totally opposite directions.

Table 13. ZTE's DOI & EPS Data 2010-2015



To be more specific, when degree of internationalization of ZTE shows a strong evidence of growth, its financial performance index starts to decline, in terms of stock earning; Similarly, when degree of internationalization drops down, its financial performance shows more positive signals. Based on all these facts, the conclusion is that for ZTE, the relationship between degree of internationalization and its financial performance is negative, which validates Hypothesis 1 with convincing evidence again.

In addition, we also collect data about TMT pay of three aspects: TMT annual compensation, TMT incentive pay, CEO-TMT pay gap, to verify the mediating effects in the models. However, the data size isn't adequate enough for us to discover the nature behind the changing trends.

Table 14. ZTE's TMT Pay Data 2010-2015

Year	DOI	TMT Annual Compensation	TMT Incentive Pay	CEO-TMT Pay Gap	EPS
2010	54.18%	140.61875	0.1917%	101.18125	0.61
2011	54.21%	125.50625	0.2192%	176.79375	-0.83
2012	53.03%	54.22142857	0.1764%	37.27857143	0.39
2013	52.60%	95.31	0.1840%	-28.01	0.77
2014	50.20%	256.4722222	0.1281%	126.3277778	0.78
2015	46.99%	339.25	0.1373%	217.75	-0.57

Taking advantage of financial data from annual reports, this case example uncovers the negative association between degree of internationalization and related performance in ZTE. To better understand the reasons for the phenomenon, we conduct two interviews with two overseas employees from ZTE. As demonstrated in the table below, Ms Shen and Ms Chen both work in HR departments, the former in Brazilian market and the latter in Italian market. During the interview, we carry out detailed discussions about their jobs, local markets and business challenges that ZTE faces in overseas markets.

Table 15. Interview Results from two ZTE Employees

Name	Ms Shen	Ms Chen
Position	HR manager	HR specialist
Subsidiary	San Paulo, Brazil	Milan, Italy
Internationalization Challenges	<ul style="list-style-type: none"> Limited knowledge and understanding about local laws and government policies; Headquarter culture has difficulty to blending into local organizations; Government issues due to the prejudice over Chinese companies. 	<ul style="list-style-type: none"> Difficult to transplant headquarter culture to global subsidiaries; Difficult to handle public issues or government issues due to great cross-culture differences.

Italy has been a developed country historically, while Brazil stands out in global markets just in the recent years. There is massive difference in various aspects about these two markets. Nevertheless, both two interviewees hold the opinion that the main challenges for ZTE lies in the limited knowledge about local markets and rising management costs resulting from oriental and western culture difference. What's more, compared with mature and open European markets, ZTE has more trouble negotiating public issues with governments and local authorities in Brazil, since the level of transparency and openness in this market is relatively low.

The results from interviews agree with our theoretical hypotheses in hypothesis development part. As a young player in global telecommunication environments, it's inevitable for ZTE to confront with challenging issues, like 'Liability of Newness' and 'Liability of Foreignness'. Rapid growth in geographical distribution brings about more cultural diversification and operational diversification, thus increasing the financial costs and operation risks for ZTE.

6.4 Summary of the case

In this chapter, our study takes a typical MNC example from China high-tech industry to penetrate the nature of internationalization from a micro point of view. After teasing out the development history and analyzing the data characteristics, our study concludes that for ZTE, the relationship between degree of internationalization and financial performance is obviously negative. To uncover the mystery, interviews with ZTE employees are adopted to summarize the reasons for our findings. Combining regression model results and case example findings, our hypothesis 1 about main effect between degree of internationalization and MNC performance is strongly validated, implying that in China high-tech industry, the increase in the number of foreign countries entered may lead to negative financial performance.

7 Discussions and Managerial implications

Nowadays, the fierce competition of business markets encourages and pushes more and more companies to execute an internationalization strategy. Companies from China high-tech industry are becoming the main force in the global trend. Despite being young and inexperienced, their inherent comparative advantages in advanced technology or low price, earn them an important place among the global competition.

To better understand the industry, we investigate a research into the relationship between internationalization level and relevant performance of MNCs from China high-tech industry, providing empirical insights in an academic perspective. Moreover, we introduce senior managers as mediators to explain the mechanism as their significant influences on company performance and strong connections with DOI. The past researches target more at CEO (Henderson & Fredrickson,1996; Sanders & Carpenter,1998) with little attention on TMT members, who can also impact organization operations and development significantly.

Hence, this study sets up a theoretical model with three TMT pay-related mediators. The regression processing with STATA, the results validate our Hypothesis 1, Hypothesis 2a and Hypothesis 2b. Accordingly, we can say that in China high-tech industry, there is a negative relationship between the degree of internationalization and MNC performance; furthermore, TMT annual compensation and TMT long-term incentive pay will weaken the negative relationship. And the control variable, firm size, also plays a positive role in the main effect, model 1 mediated by TMT annual compensation and model 2 mediated by TMT long-term incentive pay. To be specific, MNCs with higher degree of internationalization will probably perform worse than their peers; but higher levels of TMT pay in terms of both annual salary and stock option will relieve the effects, implying that the incentive of higher pay will motivate TMT members to make efforts into improving overall organization performance. Moreover, the bigger firm size is, the better they will perform, which goes well with our common sense in China high-tech industry.

7.1 In-depth discussions

(1) Impact of Degree of Internationalization (DOI) on MNC Performance

Hypothesis 1-- In China high-tech industry, a MNC's performance is negatively associated with its degree of internationalization (DOI), has been validated as predicted. There are many assumptions about the relationship between degree of internationalization (DOI) and MNC's performance—positive, negative, U-shape or inverted U-shape, etc. The regression results turn out to be negative.

Our regression results of China high-tech industry are consistent with the conclusions of Collins(1990). The main reason accounting for the phenomenon is that the high-tech industry is relatively compared with other

mature industries. Most companies were established around 1990 and pursued an internationalization strategy around 2008; some of them entered foreign markets even after 2012.

The limited operation and management experience, both domestically and globally, may probably bring about two typical issues ‘Liability of Newness’ and ‘Liability of Foreignness’ (Hymer & Stephen, 1976). After entry of into a totally foreign country, young MNCs will unavoidably lack essential market-specific knowledge of different aspects related to their business. What’s worse, it’s very difficult to learn from home country since their domestic experience is quite limited as well. Hence, it is getting more difficult to make impressive performance in the first few years, despite that they have advantages over technology or cost. What’s more, organization learning theory (Barkema & Pennings, 1996) points out that when the internationalization degree increases, MNCs will face more and more challenges and difficulty, in terms of cultural diversification, market heterogeneity, political risks and geographical distribution; thus increasing sharply the financial costs and operation risks for these young players, compared with those domestic competitors from host countries.

(2) Impact of Mediator—TMT Annual Compensation between DOI on MNC Performance

Hypothesis 2a-- In China high-tech industry, annual compensation of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance, has been validated as predicted. To be specific, given the negative relationship between degree of internationalization and MNC performance, the regression result about mediating effect of TMT annual compensation is positive.

That is to say, those MNCs from China high-tech industry with a higher level of internationalization turns out to make worse performance in the first few years; while if TMT members are offered with a higher level of annual salary, their efforts are helping to improve the organizational performance compared with peers, despite the higher DOI.

From an academic perspective, the regression results show significant empirical evidence to support ‘Incentive Theory’ (Clark & Wilson, 1961). When MNCs offer TMT members higher level of annual salary, this short-term incentive measure will effectively motivate them to increase their inputs towards organization interests, which vividly reflected in improvement of the final performance. This significant result also confirms our opinion about the important influences of TMT members on corporate governance at the same time. TMT annual compensation is one of incentive measures applied to human resource management; it is more essential to prove TMT’s irreplaceable role in corporate governance.

(3) Impact of Mediator—TMT Long-term Incentive Pay between DOI on MNC Performance

Hypothesis 2b-- In China high-tech industry, long-term incentive pay of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance, has been validated as

predicted. To be specific, given the negative relationship between degree of internationalization and MNC performance, the regression result about mediating effect of TMT Long-term Incentive Pay is positive.

That is to say, those MNCs from China high-tech industry with a higher level of internationalization turns out to make worse performance in the first few years; while if TMT members are offered with a higher percentage of stock option to all stock, their efforts are helping to improve the organizational performance compared with peers, despite the higher DOI.

From an academic perspective, the regression results show adequate empirical evidence to support ‘Incentive Theory’ (Clark & Wilson, 1961), although the mediating effect of Model 2 is less significant than Model 1. When MNCs offer TMT members higher percentage of stock option, this long-term incentive measure will effectively motivate them to increase their inputs towards organization interests, which vividly reflected in improvement of the final performance. This significant result also confirms our opinion about the important influences of TMT members on corporate governance at the same time. TMT long-term incentive pay is one of incentive measures applied to human resource management; it is more essential to prove TMT’s irreplaceable role in corporate governance.

(4) Impact of Mediator—TMT Pay Gap between DOI on MNC Performance

Hypothesis 2c-- In China high-tech industry, the pay gap between CEO and TMT will mediate positively the relationship between degree of Internationalization (DOI) and MNC Performance, hasn’t been validated as predicted.

Our academic assumption is that, based on Equity Theory (Adams, 1965), the pay gap between CEO and TMT members will discourage TMT members from motivating themselves to work harder, thus MNCs’ performance will be affected in a negative way. However, we don’t have enough data evidence to support this primary assumption.

A potential theory to explain the mismatched fact is the perception of justice. Curtis Conover and Chui(2011) conducted a cross-cultural research among students from America, China, Korea and Mexico and the results show that countries of origin can influence people’s perception of justice. The long history of feudal hierarchy in China has somewhat alleviated people’s sensitivity towards justice. China is a typical oriental country with a high-level of power distance based on Hofstede’s PDI survey (Hofstede, 1980), implying that people here have a higher level of tolerance towards the inequality of power distribution in an organization. Accordingly, we can assume that the equity theory doesn’t apply well in the China high-tech industry background as the related past researches are mostly implemented in the western organizational environments. Here in China, it is speculated that TMT members from high-tech industry won’t feel uncomfortable if they find there is a gap between their annual pay and their CEOs’, thus leaving no significant effects on corporate performance.

However, so far, this is just an assumption to explain the mismatch in regression data, which still needs further tests and confirmations.

7.2 Limitations and Future Development

This study has been trying to implement a complete and logic study to investigate the internationalization dynamics in China high-tech industry. While, the objective limitations can be inevitable given the current academic situation:

The first limitation is the limited number of samples. In this study, we choose the companies which meet the following requirements: 1.High-tech industry; 2.Internationally operated; 3.Publicly listed. The number is already quite small given this industry mainly consists of young players and the survival rate tends to be surprisingly low. Given the fact above, it leaves little to pick up when we try to further conduct a time-series research. Hence, we can only set up a relatively short period 2013-2016. In the end, 120 companies with three-year-long operation data are left after all the screening and filtrating processes.

The second limitation is the limited availability of some variables. The ‘Multi dimensions & Aggregate index’ approach is widely adopted by many researchers, which integrates synthetically the ratio of foreign sales to total sales, the ratio of foreign assets to total assets and the ratio of foreign employees to total employees (Barkema & Vermeulen, 1998). This study intended to follow the same approach, however, the ratio of foreign assets to total assets and the ratio of foreign employees to total employees, the data of these two dimensions can’t be found in most of the company annual reports. To guarantee the appropriate number of samples, we have to use one-dimension approach, thus making the measurement of DOI much more simple.

The third limitation is the limited effects to other industries. This study focus only on the high-tech in China. All the theoretical model and related hypothesizes are constructed based on the industry characteristics. Accordingly, the analysis results from STATA and final conclusions can’t apply widely to other industries, such as manufacturing and pharmaceuticals industry.

In conclusion, we suggest that future studies should attempt to overcome the relevant limitations by extending our study with more MNC samples of a longer operation period from different industries. Big samples can not only guarantee better research reliability, but bring about broad insights which can be applied to all walks of life as well. What’s more, future researchers could introduce new concepts, new variables and new approaches into the present theoretical model, expanding our understandings about TMT pay’s effects between degree of internationalization and MNC performance. For example, the current study focuses more on the independent effects of different pay-related factors, like annual salary, stock option and pay gap; Instead, future study could

penetrate into the phenomenon in a more systematic way, such as pay structure. Rather than testing different variables separately, multinational companies are more eager to know how to make up an appropriate compensation portfolio to motivate senior managers. It is not merely of high practical value in terms of business, but also uncovers a new field for academic research.

7.3 Managerial Implications

Internationalization has become an irreversible trend all over the world. More and more companies from China high-tech industry choose to pursue this strategy, joining the global competition for new markets. Through investigation, we find the negative relationship between the degree of internationalization and MNC performance; And this connection is negatively mediated by TMT annual compensation and TMT long-term incentive pay. Our study not only aims at enriching the existing academic field of internationalization, but dedicates to inspire more companies and governments with practical empirical evidence as well.

(1) Reinforce awareness of potential challenges before entry

For most companies who have not entered any foreign countries, overseas markets seem like the vast virgin territory, meaning the new customer base, new material source or new promising opportunity. Nevertheless, what they have ignored is the tremendous risks and potential costs behind the superficial prosperity.

The empirical evidence from China high-tech industry reflects the surprisingly negative relationship between degree of internationalization and MNC performance, implying that there is a great probability your company will have worse performance in terms of financial return-related indexes, even though your global market share has been rising steadily in the recent years. Many irresponsible critics contribute unsatisfactory and unsustainable status quo to the strategy of internationalization itself.

Is internationalization strategy totally a waste of time and resources from the beginning, which is doomed to fail? Of course not. A large number of western companies transformed into global giants through this strategy. Hence, the main reason turns out to be that the organization wasn't well prepared both physically and mentally indeed. Internalization is a long process which takes a mass of time, resources, efforts from employee of generations. Chinese MNCs have to make full preparations when designing and planning the long-term internationalization strategy, especially in that they are quite junior players in the global stage. Deep researches and investigations into the local market is just one important part, contingency measures against potential losses or risks can't be ignored either.

(2) Highlight the value and strengthen the cultivation of Top Management Team

There's no doubt that CEO plays an essential role in an organization's long-term development; comparatively,

the value of TMT is relatively underestimated in terms of both academic perspective and practical perspective. Based on this study, TMT members are capable to improve the overall performance of MNCs through certain incentive measures.

Internationalization is a significant process of expansion which includes not only the increase of market share, annual revenue, all these return-related indexes, but the growth of employees as well. And TMT members are the core composition of employee group as they play the role of decision-making center in the whole organization, leading the long-term strategic direction. Therefore, the importance of cultivating TMT members can't be overemphasized.

In terms of Information Processing Theory and Agency Theory, requirements and challenges towards TMT members are getting more and more strict with the rapid increase in degree of internationalization. What the organization need to solve is much more than only blindly accelerating the number of TMT members; more importantly, is to strengthen their comprehensive competences. This conclusion demands an efficient and goal-oriented talent cultivation system. Of course, recruiting mature professional managers can be another solution to the organizational demand, but this method is way more costly and less organization-specific.

(3) Integrate different pay-related measures to improve organizational performance

Our research concludes that despite the negative relationship between degree of internationalization and MNC performance, pay-related incentive measures can mediate the model in a negative way, implying that higher annual compensation and long-term incentive pay help motivate TMT members to promote organizational return index, even with very high internationalization level.

From the MNC's point of view, any methods which can improve the general performance should be appreciated. According to this study, annual salary incentive is extensively applied into the high-tech industry in China and the average TMT annual salary of industry level reaches up to 470,452.5 RMB. By contrast, the mean of TMT stock option to total corporate stock option in high-tech industry is around 0.0102621%, which way lags behind the western average level.

There is abundant empirical evidence to support our point that stock ownership incentive, as an important motivator, is underutilized. It's necessary to motivate TMT members to put efforts into corporate governance; pay-related measures can be most direct method to realize the goal. Given the current situation, MNCs can increase stock option in the pay portfolio for TMT members to stimulate their positive behaviors, in order to further improve MNC performance on an organizational level.

(4) Provide more political support for high-tech MNCs by China governments

We have offered certain advice for MNCs from China high-tech industries to better execute

internationalization strategy. However, the rapid growth and developments of MNCs can't do without the support from home country governments either. More or less, host country governments will release certain policies for the sake of domestic companies; at the same time, market competitiveness and bargaining power of foreign MNCs will be shrunk and reduced in an invisible way.

High-tech industry, which include information technology, biotechnology and new material technology, leads the business development direction. In china, this industry is highly flourishing and promising, especially for those IT players. However, despite commanding dominant advantages in technology, they still inevitably meet with various kinds of difficulty and challenges during their movements of internationalization, in that they are too young and inexperienced.

This is the right moment for the governments to come into the play. What they can do is much more than providing information about macro foreign markets and public policy interpretations. What's more, it's essential to make strong connections with MNC subsidiaries abroad through Chinese Embassy, so that they can come forward to coordinate certain major issues through diplomatic channels when MNCs are stuck with local disputes, which companies can do nothing with.

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Acknowledgements

This is the last year of my student life and this thesis would be the last homework that I need to complete in the university. It is such an emotional moment, remarking an end of old memory and a beginning of new life stage. As a country boy growing up in a small village, I can't imagine what I have gone through in the past years to achieve this far. I feel so lucky for what I have now and would like to express my most sincere gratitude to:

My grandparents, although they passed away over ten years ago, I firmly believe that they would be thrilled to know their beloved grandson would graduate as a master from two top universities.

My parents, who have raised and supported me for over 25 years. They are so selfless that they gave me all that they have. Behind this simple sentence is their generous love to their son all their life.

My mentors, Prof Alessandro Zattoni, Prof Paolo Boccardelli and Prof Yuanxu Li. They accompany me to walk through this special academic journey. Thanks to their constant attention and coach, I would complete this great challenge.

DDIM program of Fudan University and Luiss University. This two years are the best periods in my life. I study different subjects, work in different industries and travel in different countries. There is absolutely no better way to live your young life like this.

Summary

1 Introduction

Since the Chinese Economic Reform and Open Up in 1987, China has been one of the most attractive recipient land of investment all over the world. Nevertheless, what's noteworthy is that China has exceeded Japan as the world No.2 global investor since 2015. During the same year, the outward invest of China surpassed its inward invest, with 18.3% year-on-year growth which reached the new record historically.

Despite its important position in the development of national economy, there have been few researches focusing on high-tech industry in China so far. As more and more Chinese high-tech companies choose to enter different foreign markets, relevant theoretical models also need further enrichment to provide academic guidance and inspirations for internationalization operations. Accordingly, we raise the following research questions, which need further investigations and tests, in the following parts:

(1) What's the relationship between degree of internationalization and MNC performance in China high-tech industry? With the increase of internationalization level, such as larger number of foreign countries entered or higher percentage of revenue from overseas markets, will it bring about more integrated synergies and larger sales volume, or more potential risks and higher operating costs?

(2) What effects will TMT pay cast on the relationship between degree of internationalization and MNC performance in China high-tech industry? TMT members are the core composition of corporate governance system, the level of their incentive has significant influences on organization performance. Hence, if provided with various kinds of incentive measures, in terms of pay, what kinds of new outcomes will be introduced to the model?

(3) Are there any other factors, which can also influence MNC performance, besides the main variables in the model? We take firm size as control variable to see the moderating effect of some internal factors.

Our study successfully strengthens our understandings about internationalization strategy in China high-tech industry through regression analysis and case analysis. This thesis contributes to the existing literature on internationalization of MNC in three aspects:

(1) Our study provides adequate empirical evidence to support the negative relationship between degree of internationalization (DOI) and MNC performance in China high-tech industry. Contrary to common belief, financial performance will significantly worsen down with the increase in the degree of internationalization.

(2) Our study penetrates into corporate governance from a team level, rather than an individual level. The past researches attach more importance to the role of CEO, while this thesis justifies TMT members' value in a convincing way. According the regression data, the results prove that TMT members are totally capable of

improving the organizational performance.

(3) Our study innovatively introduces pay as mediators into the theoretical models. This thesis amplifies the incentive effects of TMT pay, which works effectively to explain the mechanism between degree of internationalization (DOI) and MNC performance.

2 Literature Review

2.1 Multinational Company and Internationalization

2.1.1 Introduction of Multinational Company

Multinational companies (MNC) are the corporate organizations which owns or controls the production or sales of goods and services in at least one country besides its own home country (Voorhees R, 1992). Nowadays, foreign direct investment (FDI) tend to be the main channel for domestic companies to go international; some specific approaches primarily include ‘Merger and Acquisition’(M&A) and Greenfield Investment (Wang M, Wong M, 2009).

2.1.2 Definition of Internationalization

For the moment, there hasn’t been established the widely agreed definition for ‘Internationalization’ in the field of strategy management. Vernon (1966), based on product cycle theory, points out that the degree of internationalization increases as product export evolves into capital or technology export with the development of product life cycle. Johanson and Vahlne (1978), emphasize that internationalization is a consistent process in which the companies gradually increase their international involvement according to company behaviors in business operations. The concept extends as the research goes further and deeper. Annavarjula (2000) measures the internationalization of a firm in terms of three dimensions: overseas operations, overseas asset ownership and international orientation in management style, strategy & organization structure.

2.2 Top Management Team and TMT Compensation

2.2.1 Introduction of Top Management Team (TMT)

The concept, Top Management Team, originates from the Upper Echelons Theory of Hambrick and Mason (1984). A top management team (TMT) is a specific form of team where the members typically consist of some of the top managers, such as vice president and finance manager, in the company (West, 2005). In China, *LAW of Corporation, Article 217*, regulates that top management personnel include general manager, vice manager, chief finance officer, board secretary from listed companies and other employees based on company regulations.

2.2.2 Discussion about TMT Compensation

A new highlight about TMT theory in the recent years is TMT compensation due to the emergence and popularity of new compensation forms applied into employee management system. Related compensation theory of top management team is built on the basis of Human Capital Theory, which emphasizes the value of human (Schultz, 1961). Becker (1962) argues that employees, especially those with high-level skills, have reasonable rights to ask for appropriate part of the retained earnings from employers.

2.3 MNC Performance

Actually, organizational performance consists of three specific types of firm outcomes: 1.financial performance, such as ROA, ROE and EPS; 2.product market performance, such as sales volume, market share and survival; 3.shareholder return, such as added value (Richard & Devinney, 2009).

3 Hypothesis Development

3.1 Degree of Internationalization (DOI) and MNC Performance

There are already plenty of discussions explaining the relationship between degree of internationalization (DOI) and MNC performance. Mainstream opinions are illustrated as below:

(1) Positive relationship between DOI and MNC Performance

The most traditional and common opinion about internationalization is that the higher degree of internationalization that MNCs present, the better performance they will realize in the future. Many classic researches in early time have shown abundant evidence to support this conclusion. The samples of 304 British manufacturing companies by Grant (1987), 192 American manufacturing companies by Tallman(1996) and 399 Japanese manufacturing companies by Delios (1999) all show that degree of internationalization will impact performance positively. The phenomenon not only applies to MNCs of large scale, but exists widely among small-and-medium-sized MNCs as well (Pangarkar , 2008).

There are many theories accounting for the principles of the positive relationship. 1.FDI theory—Dunning (1977) explains MNCs' advantages in ownership, location and internationalization, lead to the success of multinational operations, compared with domestic companies by OLI paradigm; 2.Organization learning theory-- Johanson and Vahlne (1977) raise that internationalization is a progressive process, during which MNCs can learn totally new knowledge through foreign market operations. This kind of new knowledge mainly consist of general internationalization knowledge and market-specific knowledge; 3.Resource-based view theory—Caves(2007) holds the view that internationalization is a great opportunity for MNCs to access

and integrate global resources, further shaping the capacity of efficient resource allocation.

(2) Negative relationship between DOI and MNC Performance

However, some scholars hold the opposite view about the relationship between degree of internationalization and MNC performance, instead they insist that degree of internationalization will impact performance negatively. The first objector is Collins (1990). He collects and analyzes data from three groups of American firms: ones without significant international operations, ones with international operations in developed countries, and ones with international operations in developing countries. The ultimate findings show that developing country with higher level of DOI contribute to inferior performance, but that there are no statistically significant differences in market performance among the three groups. Denis's research (2002) also proves the negative linear relationship between MNC stock market value and degree of internationalization.

To understand the reasons about the negative links between these two variables, we need to introduce two concepts 'Liability of Newness' and 'Liability of Foreignness', implying that MNCs face various kinds of disadvantages and challenges as a newcomer in different foreign markets (Hymer & Stephen, 1976). Organization learning theory also supports this conclusion from a different perspective. Barkema and Pennings (1996) find that the complication of internationalization will increase significantly with the expansion of geographical distribution and cultural diversification, hence enhancing financial costs and operation risks for MNCs.

As a whole, the MNCs from China high-tech industry are relatively young and most of them were established around year 2000, implying that they only have around 20-year-long domestic operation experience. What's more, the turbulent wave of internationalization in China primarily took place around 2008-2010; Thus, we can assume that the current situation in China high-tech industry applies more to the negative relationship assumption as mentioned above.

Hypothesis 1: In China high-tech industry, a MNC's performance is negatively associated with its degree of internationalization (DOI).

3.2 Top Management Team(TMT) Pay between Degree of Internationalization (DOI) and MNC Performance

Taking Information-processing theory and Agency theory together, we can conclude that the increase in degree of internationalization will bring about more complexity in organization governance, thus stimulating the overall information-processing and agency demands to institute more efficient governance arrangements (Finkelstein & Hambrick, 1996). Based on this, the high complexity and high requirements of multi-national

operations for TMT members need to be remedied with appropriate compensation levels. Further, the positive relationship between degree of internationalization and pay level of TMT members have been supported by tremendous empirical evidences.

What's more, organizations, like MNCs, usually distribute incentive measures to members in order to induce them to contribute to intended activities, according to 'Incentive Theory' (Clark & Wilson, 1961). Main types of incentives include: 1.material-- tangible rewards which mostly have monetary value; 2.solidary-- intangible rewards which derive mainly from the acts of organizations; 3.purposive-- intangible rewards which derive mainly from the stated end. For example, Employee compensations are the most common form in terms of material incentives. From the perspective of Content-Based Incentive Theory, employee compensations not only fulfill psysiological needs and safety needs of low hierarchy, but play an important role in esteem needs and self-actulization needs of high hierarchy as well (Maslow, 1954). The incentive effects of compensations on TMT members are reflected in the overall organizational performance as they are decision-making center of whole organization which leads the strategic direction. Whereas, employees not merely compare salaries to their past numbers, but with other internal members, especially those similar to themselves, as well. Based on the Equity Theory (Adams, 1965), large pay gap will cast significantly negative effects on employees' job performance (Bloom & Michel, 2002).

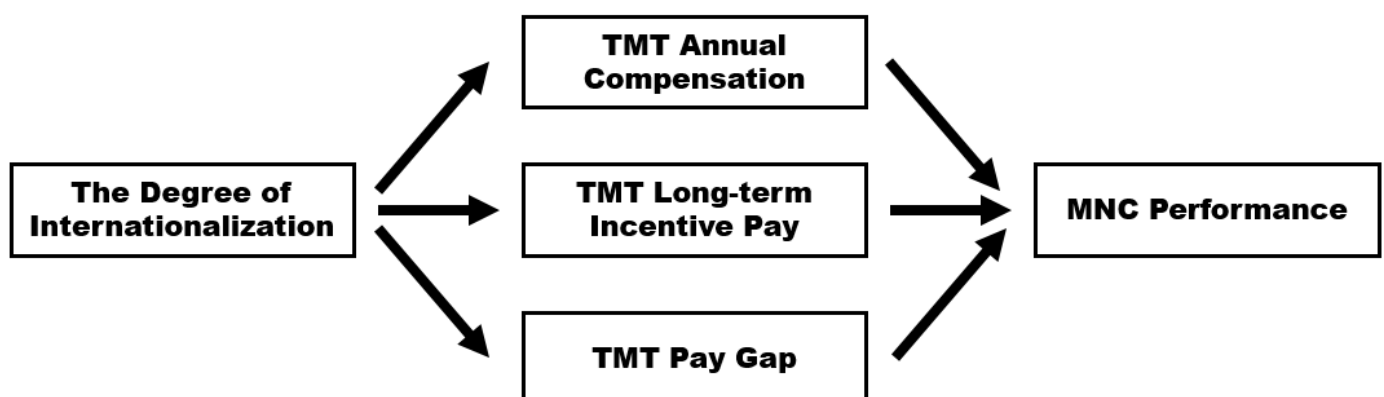
Accordingly, we put forward the following hypotheses:

Hypothesis 2a: In China high-tech industry, annual compensation of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Hypothesis 2b: In China high-tech industry, long-term incentive pay of TMT will negatively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Hypothesis 2c: In China high-tech industry, the pay gap between CEO and TMT will positively mediate the relationship between degree of Internationalization (DOI) and MNC Performance.

Graph 2. Theoretical Model



4 Research Method

4.1 Sample and Data Sources

The research objects are all selected from the high-tech industry in China, including information technology, biotechnology and new material technology, these three sub-industries. Among them, we target at all the companies publicly listed in Shenzhen & Shanghai Stock market which conduct business in more than one country besides their own home countries.

4.2 Variable Measurement

Independent Variable—Degree of Internationalization (DOI):

$$DOI = 1 - \text{Domestic Revenue} / \text{Total Revenue}$$

Mediator 1—TMT Annual Compensation:

$$TMT \text{ Annual Compensation} = \text{Sum of Every TMT Member's Annual Salary} / \text{Number of TMT Members}$$

Mediator 2—TMT Long-term Incentive Pay:

$$TMT \text{ Long-term Incentive Pay} = \text{Sum of Every TMT Member's Sock Option} / \text{Number of Total Stock Option}$$

Mediator 3—CEO-TMT Pay Gap:

$$TMT \text{ Pay Gap} = CEO \text{ Annual Compensation} - TMT \text{ Annual Compensation}$$

Dependent Variable—MNC Performance:

Considering that the sample companies are all publicly listed, this study chooses EPS as the measurement of MNC performance from all the return-related indexes.

Control Variable—Firm Size:

$$Firm \text{ Size} = \ln(\text{Total asset of the company})$$

5 Results and Analysis

5.1 Descriptive Statistics

Table 1. Descriptive Statistics of Variables

Variables	Obs	Mean	Std. Dev	Min	Max
DOI	360	18.60831	23.44404	0	93.87
TMT Annual Compensation	360	3.85111	0.668981	0.5653138	5.550912
TMT Long-term Incentive Pay	360	0.0102621	0.0288199	0	0.170997

TMT Pay Gap	360	7.566612	0.4018371	0	7.771067
EPS	360	0.4556583	0.5300638	-0.96	2.73
Firm Size	360	21.91045	1.212282	14.94164	25.03197

5.2 Correlation Coefficients

Table 2. Correlation Coefficients among Variables

	DOI	TMT Annual Compensation	TMT Long-term Incentive Pay	TMT Pay Gap	EPS	Firm Size
DOI	1.0000					
TMT Annual Compensation	-0.0347	1.0000				
TMT Long-term Incentive Pay	-0.0435	0.0175	1.0000			
TMT Pay Gap	0.0205	-0.1733*	0.0179	1.0000		
EPS	-0.1527*	0.2929*	0.1028*	0.0028	1.0000	
Firm Size	0.0025	0.5395*	-0.0346	0.0581	0.2051*	1.0000

5.3 Regression Model

Table 3. Regression Model of Three Models

	EPS	EPS	EPS	EPS	EPS	EPS
DOI	-0.002** (-2.218)	-0.002** (-2.129)	-0.002** (-2.326)	-0.002** (-2.003)	-0.004*** (-3.584)	0.154 (0.987)
TMT Annual Compensation	0.391*** (3.900)			0.808*** (5.073)		
TMT Long-term Incentive Pay		1.761*** (2.598)			1.352** (2.311)	
TMT Pay Gap			0.109 (0.214)			0.500 (0.853)
DOI*TMT Annual Compensation				0.013*** (2.811)		
DOI*TMT Long-term Incentive Pay					0.108** (2.421)	
DOI*TMT Annual Compensation						-0.020 (-0.998)
Firm Size	0.050*** (2.678)	0.085*** (5.257)	0.084*** (5.084)	0.038 (1.466)	0.094*** (4.234)	0.084*** (5.065)
Cons	-0.829** (-2.151)	-1.449*** (-4.094)	-2.238 (-0.594)	-0.661 (-1.220)	-1.540*** (-3.163)	-5.211 (-1.185)
N	360	360	360	360	360	360
R-square	0.130	0.098	0.088	0.129	0.091	0.089

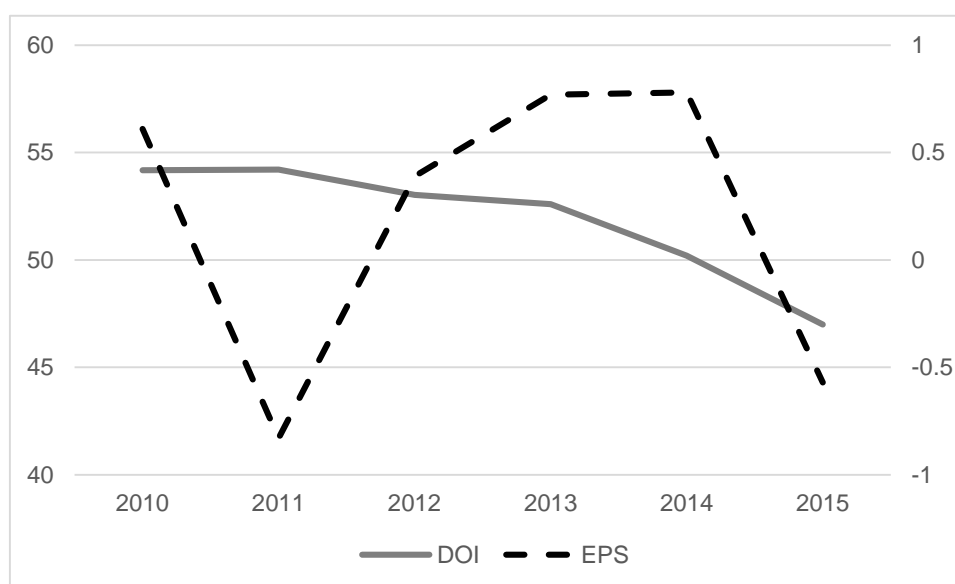
5.4 Summary of Data Results

After the data processing with Stata and related regression analysis, the results show that Hypothesis 1, Hypothesis 2a and Hypothesis 2b have been well validated, signifying that in China high-tech industry, MNC with higher degree of internationalization turn out to make worse performance; Meanwhile, this negative relationship is significantly mediated by TMT pay-related factors, which means, if TMT members are provided with higher annual salary and higher stock options, to certain extent their efforts will help improve the organization performance despite that the company is highly international. What's more, firm size can also moderate the dependent variable in that the larger scale or more asset a MNC has, the better the company will perform, compared with those small peers.

6 Case Analysis

As illustrated in the table below, DOI for ZTE in 2010 is 54.18%, in 2011 is 54.21%, in 2012 is 53.03%, in 2013 is 52.60%, in 2014 is 50.20%, and in 2015 46.99%. The changing trend of this factor goes up slightly in 2010 and declines rapidly year by year. At the same time, EPS for ZTE in 2010 is 0.61, in 2011 is -0.83 in 2012 is 0.39, in 2013 is 0.77, in 2014 is 0.78, and in 2015 is -0.57. On the contrary, this factor decreases significantly in the beginning and starts to grow gradually after 2011. Although EPS in 2015 goes down distinctly, overall, we can say that degree of internationalization and MNC performance changes in totally opposite directions.

Table 13. ZTE's DOI & EPS Data 2010-2015



To be more specific, when degree of internationalization of ZTE shows a strong evidence of growth, its financial performance index starts to decline, in terms of stock earning; Similarly, when degree of

internationalization drops down, its financial performance shows more positive signals. Based on all these facts, the conclusion is that for ZTE, the relationship between degree of internationalization and its financial performance is negative, which validates Hypothesis 1 with convincing evidence again.

In addition, we also collect data about TMT pay of three aspects: TMT annual compensation, TMT incentive pay, CEO-TMT pay gap, to verify the mediating effects in the models. However, the data size isn't adequate enough for us to discover the nature behind the changing trends.

Table 14. ZTE's TMT Pay Data 2010-2015

Year	DOI	TMT Annual Compensation	TMT Incentive Pay	CEO-TMT Pay Gap	EPS
2010	54.18%	140.61875	0.1917%	101.18125	0.61
2011	54.21%	125.50625	0.2192%	176.79375	-0.83
2012	53.03%	54.22142857	0.1764%	37.27857143	0.39
2013	52.60%	95.31	0.1840%	-28.01	0.77
2014	50.20%	256.4722222	0.1281%	126.3277778	0.78
2015	46.99%	339.25	0.1373%	217.75	-0.57

Taking advantage of financial data from annual reports, this case example uncovers the negative association between degree of internationalization and related performance in ZTE. To better understand the reasons for the phenomenon, we conduct two interviews with two overseas employees from ZTE. As demonstrated in the table below, Ms Shen and Ms Chen both work in HR departments, the former in Brazilian market and the latter in Italian market. During the interview, we carry out detailed discussions about their jobs, local markets and business challenges that ZTE faces in overseas markets.

Table 15. Interview Results from two ZTE Employees

Name	Ms Shen	Ms Chen
Position	HR manager	HR specialist
Subsidiary	San Paulo, Brazil	Milan, Italy
Internationalization Challenges	<ul style="list-style-type: none"> Limited knowledge and understanding about local laws and government policies; Headquarter culture has difficulty to blending into local organizations; 	<ul style="list-style-type: none"> Difficult to transplant headquarter culture to global subsidiaries; Difficult to handle public issues or government issues due to great cross-

-
- Government issues due to the prejudice over Chinese companies. culture differences.
-

Italy has been a developed country historically, while Brazil stands out in global markets just in the recent years. There is massive difference in various aspects about these two markets. Nevertheless, both two interviewees hold the opinion that the main challenges for ZTE lies in the limited knowledge about local markets and rising management costs resulting from oriental and western culture difference. What's more, compared with mature and open European markets, ZTE has more trouble negotiating public issues with governments and local authorities in Brazil, since the level of transparency and openness in this market is relatively low.

7 Discussions and Managerial implications

7.1 Limitations and Future Development

This study has been trying to implement a complete and logic study to investigate the internationalization dynamics in China high-tech industry. While, the objective limitations can be inevitable given the current academic situation:

The first limitation is the limited number of samples. In this study, we choose the companies which meet the following requirements: 1.High-tech industry; 2.Internationally operated; 3.Publicly listed. The number is already quite small given this industry mainly consists of young players and the survival rate tends to be surprisingly low. Given the fact above, it leaves little to pick up when we try to further conduct a time-series research. Hence, we can only set up a relatively short period 2013-2016. In the end, 120 companies with three-year-long operation data are left after all the screening and filtrating processes.

The second limitation is the limited availability of some variables. The 'Multi dimensions & Aggregate index' approach is widely adopted by many researchers, which integrates synthetically the ratio of foreign sales to total sales, the ratio of foreign assets to total assets and the ratio of foreign employees to total employees (Barkema & Vermeulen, 1998). This study intended to follow the same approach, however, the ratio of foreign assets to total assets and the ratio of foreign employees to total employees, the data of these two dimensions can't be found in most of the company annual reports. To guarantee the appropriate number of samples, we have to use one-dimension approach, thus making the measurement of DOI much more simple.

The third limitation is the limited effects to other industries. This study focus only on the high-tech in China. All the theoretical model and related hypothesizes are constructed based on the industry characteristics. Accordingly, the analysis results from STATA and final conclusions can't apply widely to other industries,

such as manufacturing and pharmaceuticals industry.

7.3 Managerial Implications

Internationalization has become an irreversible trend all over the world. More and more companies from China high-tech industry choose to pursue this strategy, joining the global competition for new markets. Through investigation, we find the negative relationship between the degree of internationalization and MNC performance; And this connection is negatively mediated by TMT annual compensation and TMT long-term incentive pay. Our study not only aims at enriching the existing academic field of internationalization, but dedicates to inspire more companies and governments with practical empirical evidence as well.

(1) Reinforce awareness of potential challenges before entry

For most companies who have not entered any foreign countries, overseas markets seem like the vast virgin territory, meaning the new customer base, new material source or new promising opportunity. Nevertheless, what they have ignored is the tremendous risks and potential costs behind the superficial prosperity.

The empirical evidence from China high-tech industry reflects the surprisingly negative relationship between degree of internationalization and MNC performance, implying that there is a great probability your company will have worse performance in terms of financial return-related indexes, even though your global market share has been rising steadily in the recent years. Many irresponsible critics contribute unsatisfactory and unsustainable status quo to the strategy of internationalization itself.

Is internationalization strategy totally a waste of time and resources from the beginning, which is doomed to fail? Of course not. A large number of western companies transformed into global giants through this strategy. Hence, the main reason turns out to be that the organization wasn't well prepared both physically and mentally indeed. Internalization is a long process which takes a mass of time, resources, efforts from employee of generations. Chinese MNCs have to make full preparations when designing and planning the long-term internationalization strategy, especially in that they are quite junior players in the global stage. Deep researches and investigations into the local market is just one important part, contingency measures against potential losses or risks can't be ignored either.

(2) Highlight the value and strengthen the cultivation of Top Management Team

There's no doubt that CEO plays an essential role in an organization's long-term development; comparatively, the value of TMT is relatively underestimated in terms of both academic perspective and practical perspective. Based on this study, TMT members are capable to improve the overall performance of MNCs through certain incentive measures.

Internationalization is a significant process of expansion which includes not only the increase of market share, annual revenue, all these return-related indexes, but the growth of employees as well. And TMT members are the core composition of employee group as they play the role of decision-making center in the whole organization, leading the long-term strategic direction. Therefore, the importance of cultivating TMT members can't be overemphasized.

In terms of Information Processing Theory and Agency Theory, requirements and challenges towards TMT members are getting more and more strict with the rapid increase in degree of internationalization. What the organization need to solve is much more than only blindly accelerating the number of TMT members; more importantly, is to strengthen their comprehensive competences. This conclusion demands an efficient and goal-oriented talent cultivation system. Of course, recruiting mature professional managers can be another solution to the organizational demand, but this method is way more costly and less organization-specific.

(3) Integrate different pay-related measures to improve organizational performance

Our research concludes that despite the negative relationship between degree of internationalization and MNC performance, pay-related incentive measures can mediate the model in a negative way, implying that higher annual compensation and long-term incentive pay help motivate TMT members to promote organizational return index, even with very high internationalization level.

From the MNC's point of view, any methods which can improve the general performance should be appreciated. According to this study, annual salary incentive is extensively applied into the high-tech industry in China and the average TMT annual salary of industry level reaches up to 470,452.5 RMB. By contrast, the mean of TMT stock option to total corporate stock option in high-tech industry is around 0.0102621%, which way lags behind the western average level.

There is abundant empirical evidence to support our point that stock ownership incentive, as an important motivator, is underutilized. It's necessary to motivate TMT members to put efforts into corporate governance; pay-related measures can be most direct method to realize the goal. Given the current situation, MNCs can increase stock option in the pay portfolio for TMT members to stimulate their positive behaviors, in order to further improve MNC performance on an organizational level.

(4) Provide more political support for high-tech MNCs by China governments

We have offered certain advice for MNCs from China high-tech industries to better execute internationalization strategy. However, the rapid growth and developments of MNCs can't do without the support from home country governments either. More or less, host country governments will release certain policies for the sake of domestic companies; at the same time, market competitiveness and bargaining power of foreign MNCs will be shrunk and reduced in an invisible way.

High-tech industry, which include information technology, biotechnology and new material technology, leads the business development direction. In china, this industry is highly flourishing and promising, especially for those IT players. However, despite commanding dominant advantages in technology, they still inevitably meet with various kinds of difficulty and challenges during their movements of internationalization, in that they are too young and inexperienced.

This is the right moment for the governments to come into the play. What they can do is much more than providing information about macro foreign markets and public policy interpretations. What's more, it's essential to make strong connections with MNC subsidiaries abroad through Chinese Embassy, so that they can come forward to coordinate certain major issues through diplomatic channels when MNCs are stuck with local disputes, which companies can do nothing with.