# Pecking order financing and inclusion of innovative SMEs in China

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# INTRODUCTION

- The way to the **so-called pecking order financing** theory was opened in particular **by Myers (1984), Myers-Majluf (1984) and Fazzari-Hubbard-Petersen (1988)** and laid the foundations for **the study of firms financing hierarchies**.

- According to these approaches **the sources of financing are not perfect substitutes,** one as good as another.

- Firms **follow indeed a hierarchic order** in their use on the basis of which **internal sources (internal cash-flows) are to be preferred to bank credit,** which in turn is favored **above the direct issue of shares**.

# INTRODUCTION

- More recently **this traditional pecking order has been reconsidered** for the **study of innovative firms' financing** (Audretsch-Lehmann, 2002; Cosh-Hughes, 2003; Sau, 2008) **since they have peculiar characteristics** that set them **largely apart from the traditional firms** (Gompers-Lerner, 1999; Antonelli-Teubal, 2006).
- **The innovative firms** are **indeed markedly speculative agents** in that **they may well find themselves** bearing liabilities (above all in the start-up stage) in excess of the expected future income flows.
- Quite often the **innovative firms are not even in a condition to be able to offer sufficient guarantees**, whether implicit or explicit, **to alleviate the creditor's risk**.

# INTRODUCTION

- The first observation to make with regard to the innovative firms has to do with **the fact that the financial requirements and degree of risk often depend on the stage of development (i.e. age) reached with the investment plan.**
- Basically, we can distinguish **four different stages**:
- **seed** (conception of the innovative idea)

(0-1 year)

- **start-up** (starting on the innovative process), (Chuangban jieduan)

(1-3 years)

- **early growth** (initial stage of expansion), (Touru jinying jieduan)

(4-10 years)

- **sustained growth** (consolidation stage), (Zhenzhang fazhan jieduan)

(>10 years)

# INTRODUCTION

- To put it in a few words, **the phases calling for financing are in particular, then, the start-up and early growth stages** of the innovative project, **while it is the seed and start-up stages that show the highest degrees of risk**.
- Indeed, according to the theory quoted, **inside finance and private equity (venture capital) are crucial both for the inclusion in the process of financing and for the development of innovative** small medium enterprises (SMEs).
- The **banking support and public equity financing follow** indeed in the pecking order, **since more information, collaterals and/or tracks records are essential to avoid credit and equity rationing**.
- **The traditional hierarchy** considered for traditional firms, **which sees the use of debt capital preferred to risk-capital** is **in fact perfectly inverted** in the case of the innovative firms.

# FIG.1 Pecking Order for Innovative Firms

**Insider Finance - Angel Finance – Easy-term public financing**

⇓

**SEED**

⇓

**Venture Capital Financing**

⇓

**START-UP**

⇒ **IPO**

⇓

**Inside Finance (cash-flows) – New debt financing - Business credit**

⇓

**EARLY-GROWTH**

⇓

**New Shares and Bonds Issues**

⇓

**SUSTAINED-GROWTH**

# INTRODUCTION

This paper considers **pecking order financing** theory to account for the development of innovative SMEs firms in China at **different stages/ages** of **business development** and is based particularly on **World Bank Survey data (2013).**

- The **emergence and development of high-tech SMEs** in China is relatively recent, having primarily occurred **over the last 20 years** (cf. Ahlstrom and Bruton 2002 and Li Xiao, 2011**).**
- As argued by **Li Xiao (2011, p. 218-219), the changing financial environment and its relationship to high-tech SMEs** may appropriately be examined in **two distinct phases**, **the mid-1980s to the mid-1990s**, followed by **the late 1990s to the present time**.

# High-tech Pecking Order Financing in China

- The **first phase** stemmed from the promulgation of ‘the Decision on the **Reform of the Science and Technology Management System’ by the Chinese Communist Party Central Committee in the mid-1980s**. Permission **was given to state-owned organizations such as universities, research institutes, and local governments to establish self financed and market-driven new ventures.**

- These early high-tech SMEs **were jointly found by groups of academics combined with a public body** known as a **‘supervisory agency**’ (e.g. university, research institute or local government) (see, **Li Xiao (2011)**.

- The **initial capital investment** usually came from **the supervisory agencies** (i.e. **easy-term public finance FIG. 1**).

# High-tech Pecking Order Financing in China

- As regards the **second phase**, the supply of investment capital **has switched** from the **public sector supervisory agencies**, to a more **market-oriented provision** by the private, commercial and public sectors.
- Nevertheless, although the business environment for the private sector in China has improved in recent years, **the financial infrastructure has lagged far behind that in developed countries**.
- **As we try to argue later, large disparities** remain in the development **of banking sectors and venture capital** markets **between western countries and China** (Pukthuanthong and Walker, 2007; Guariglia-Liu, 2014) **even if** the **World Bank Survey** data show **some improvements** as regards **the financial constraints of innovative firms.**

# High-tech Pecking Order Financing in China

-The World Bank survey data show **that for all the firms having an age longer than 4 years** the internal financing (internal cash-flows) accounted **for more than 86%** of their working capital, **while banking loans account for about 8%** (**see Table 2).**

-For firms **which have innovation in the last 3 years**, more than 76% said **there is no obstacle or just minor obstacle**. But **compared** with firms **that dididn't introduce any new product/service** in the last 3 years, **innovative firms are facing higher financing obstacles**. **So innovation introduces financial constraints** (**see Table 7**).

-Unfortunately **Venture Capital and Private Equity** are **not included in the dataset**.

# TABLE 2 Proportion of Working Capital

| Variable | Full sample | | Firms with innovation in last 3 years | |
|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. |
| Internal funds or retained earnings | 86.74889 | 24.6815 | 85.69762 | 23.14755 |
| Borrowed from banks: private and state-owned | 6.543704 | 14.88473 | 7.97619 | 14.92404 |
| Borrowed from non-bank financial institutions which include microfinance institutions, credit cooperatives, credit unions, or finance companies | 0.5325926 | 5.726835 | 0.5269841 | 4.938549 |
| Purchases on credit from suppliers and advances from customers | 2.74037 | 10.22708 | 3.421429 | 10.65404 |
| Other, moneylenders, friends, relatives, etc. | 0.4103704 | 4.395142 | 0.4452381 | 3.918067 |
| Number of observations | 2700 | | 1260 | |

Data source: World Bank Enterprise Survey 2013

## TABLE 7. Whether Access to Finance is an Obstacle (Percent)

| To what degree is Access to Finance an obstacle to the current operations | In last 3 year, introduced new products/services? (Percent) | | |
|---|---|---|---|
| | Don't know | Yes | No |
| Don't know | 0 | 0.48 | 0.28 |
| Does not apply | 0 | 0.63 | 0.7 |
| No obstacle | 50 | 35.08 | 49.65 |
| Minor obstacle | 12.5 | 41.19 | 32.75 |
| Moderate obstacle | 12.5 | 18.25 | 12.43 |
| Major obstacle | 12.5 | 3.73 | 3.56 |
| Very severe obstacle | 12.5 | 0.63 | 0.63 |

Data source: World Bank Enterprise Survey 2013

# High-tech Pecking Order Financing in China

High tech SMEs' strong reliance on **internal financing started to decrease since the 10th year of their operation**, and for those **enterprises younger than 5 years, internal resources accounted for 92% of their total financing** (Yan & Ai, 2010).

The high tech enterprises listed on China's Nasdaq, namely **Growth Enterprise Market** show that the **484 listed enterprises are on average more than 14 years old,** and nearly **11 years old** when they were **listed for the first time** (see **Table 1- Age at IPO**).

- In addition, their mean registered assets stood at 361,772,255 RMB ($56,891,824), and their mean staff number is very high close to 1311. **This means the IPO threshold for high tech enterprises is still very high in China**, and those **who could get financial support** from **the stock market are mainly medium sized or even big enterprises**.

| | TABLE 1 | Summary Statistics of Companies Listed (484) on the Growth Enterprise Market | | | | |
|---|---|---|---|---|---|---|
| | Age | Age at IPO | Registered Assets (RMB) | Staff Number | Total Shares | |
| | | | | | | |
| **Mean** | 14.21342 | 10.89376054 | 361772255.6 | 1311.559917 | 359696440.4 | |
| **Standard Error** | 0.179917 | 0.18980135 | 14017113.44 | 177.3727378 | 13930194.43 | |
| **Median** | 14.0124 | 10.0079 | 272774907.5 | 780 | 271487969.5 | |
| **Mode** | 12.0306 | 10.0419 | 120000000 | 339 | 120000000 | |
| **Standard Deviation** | 3.958175 | 4.175629695 | 308376495.7 | 3902.200232 | 306464277.4 | |

# High-tech Pecking Order Financing in China

- The evidence **shows that banking credit** support for the SMEs is still limited in China (cf. **Table 3**).
- This is **in compliance with** the analysis by Guariglia and Liu (2014) conducted on more than 120,000 mainly unlisted Chinese firms over the period between 2000 and 2007, and found that the innovation activities conducted by Chinese firms **are constrained by the availability of internal finance**, with **private small firms suffering the most among other ownerships** (Guariglia & Liu, 2014, i.e. "**Political" Pecking Order in the Chinese capital market!**).
- In addition, they observed that such constraint **is particularly binding to the innovation activities of small firms** – those **are located in the coastal provinces**, with **low political affiliation** as well as for sole proprietorship firms.

| TABLE 3. Proportion of Working Capital by Firm Size | | | | | | |
|---|---|---|---|---|---|---|
| | Small | | Medium | | Large | |
| Variable | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Internal funds or retained earnings | 89.78305 | 22.35612 | 85.73053 | 26.0626 | 84.06192 | 25.40345 |
| Borrowed from banks: private and state-owned | 4.295661 | 12.78803 | 6.270526 | 13.95709 | 9.820817 | 17.71899 |
| Borrowed from non-bank financial institutions which include microfinance institutions, credit cooperatives, credit unions, or finance companies | 0.5045409 | 5.589468 | 0.4821053 | 5.784248 | 0.6324111 | 5.837108 |
| Purchases on credit from suppliers and advances from customers | 3.072654 | 11.0602 | 2.447368 | 9.44536 | 2.673254 | 10.03509 |
| Other, moneylenders, friends, relatives, etc. | 0.308779 | 3.560092 | 0.6515789 | 5.730851 | 0.2411067 | 3.316004 |
| Observation | 991 | | 950 | | 759 | |
| Data source: World Bank Enterprise Survey 2013 | | | | | | |

## TABLE 4. Proportion of Working Capital by Firm Age

| | Firm age ≤10 | | Firms age >10 | |
|---|---|---|---|---|
| **Variable** | Mean | Std. Dev. | Mean | Std. Dev. |
| **Internal funds or retained earnings** | 82.7327 | 28.52396 | 87.28505 | 24.07846 |
| **Borrowed from banks: private and state-owned** | 8.292453 | 17.96595 | 6.310243 | 14.41212 |
| **Borrowed from non-bank financial institutions which include microfinance institutions, credit cooperatives, credit unions, or finance companies** | 0.0566038 | 3.742071 | 0.5961377 | 5.939549 |
| **Purchases on credit from suppliers and advances from customers** | 3.886792 | 12.39618 | 2.587322 | 9.894686 |
| **Other, moneylenders, friends, relatives, etc.** | 3.3584906 | 0.792377 | 0.4172964 | 4.470126 |
| **Observation** | 318 | | 2382 | |

**Data source: World Bank Enterprise Survey 2013**

## TABLE 5. Reasons Why Firms Didn't Apply for Any Credit or Loan

| What was the main reason why this establishment did not apply for any line of credit or loan | In last 3 years, introduced new products/services? | | | |
|---|---|---|---|---|
| | Don't know | Yes | No | Total |
| Don't know | 0 | 14 | 7 | 21 |
| No need for a loan - establishment had sufficient capital | 4 | 495 | 598 | 1,097 |
| Application procedures were complex | 1 | 97 | 114 | 212 |
| Interest rates were not favorable | 0 | 76 | 114 | 190 |
| Collateral requirements were too high | 0 | 58 | 105 | 163 |
| Size of loan and maturity were insufficient | 0 | 41 | 85 | 126 |
| Did not think it would be approved | 0 | 31 | 51 | 82 |
| Other | 0 | 15 | 15 | 30 |
| | | | | |
| Total | 5 | 827 | 1089 | 1,921 |

Data source: World Bank Enterprise Survey 2013

# TABLE 6. Whether Access to Finance is an Obstacle

| To what degree is Access to Finance an obstacle to the current operations | In last 3 year, introduced new products/services? | | | |
|---|---|---|---|---|
| | Don't know | Yes | No | Total |
| Don't know | 0 | 6 | 4 | 10 |
| Does not apply | 0 | 8 | 10 | 18 |
| No obstacle | 4 | 442 | 711 | 1.157 |
| Minor obstacle | 1 | 519 | 469 | 989 |
| Moderate obstacle | 1 | 230 | 178 | 409 |
| Major obstacle | 1 | 47 | 51 | 99 |
| Very severe obstacle | 1 | 8 | 9 | 18 |
| Total | 8 | 1260 | 1432 | 2,700 |

Data source: World Bank Enterprise Survey 2013

## Whether Access to Finance is an Obstacle

| To what degree is access to finance an obstacle to the current operations | Full sample | | IT industry | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| **Don't know** | 10 | 0.37 | 1 | 0.7 |
| **Does not apply** | 18 | 0.67 | 1 | 0.7 |
| **No obstacle** | 1157 | 42.85 | 71 | 49.65 |
| **Minor obstacle** | 989 | 36.63 | 42 | 29.37 |
| **Moderate obstacle** | 409 | 15.15 | 22 | 15.38 |
| **Major obstacle** | 99 | 3.67 | 6 | 4.2 |
| **Very severe obstacle** | 18 | 0.67 | 0 | 0 |
| **Observation** | 2700 | | 143 | |

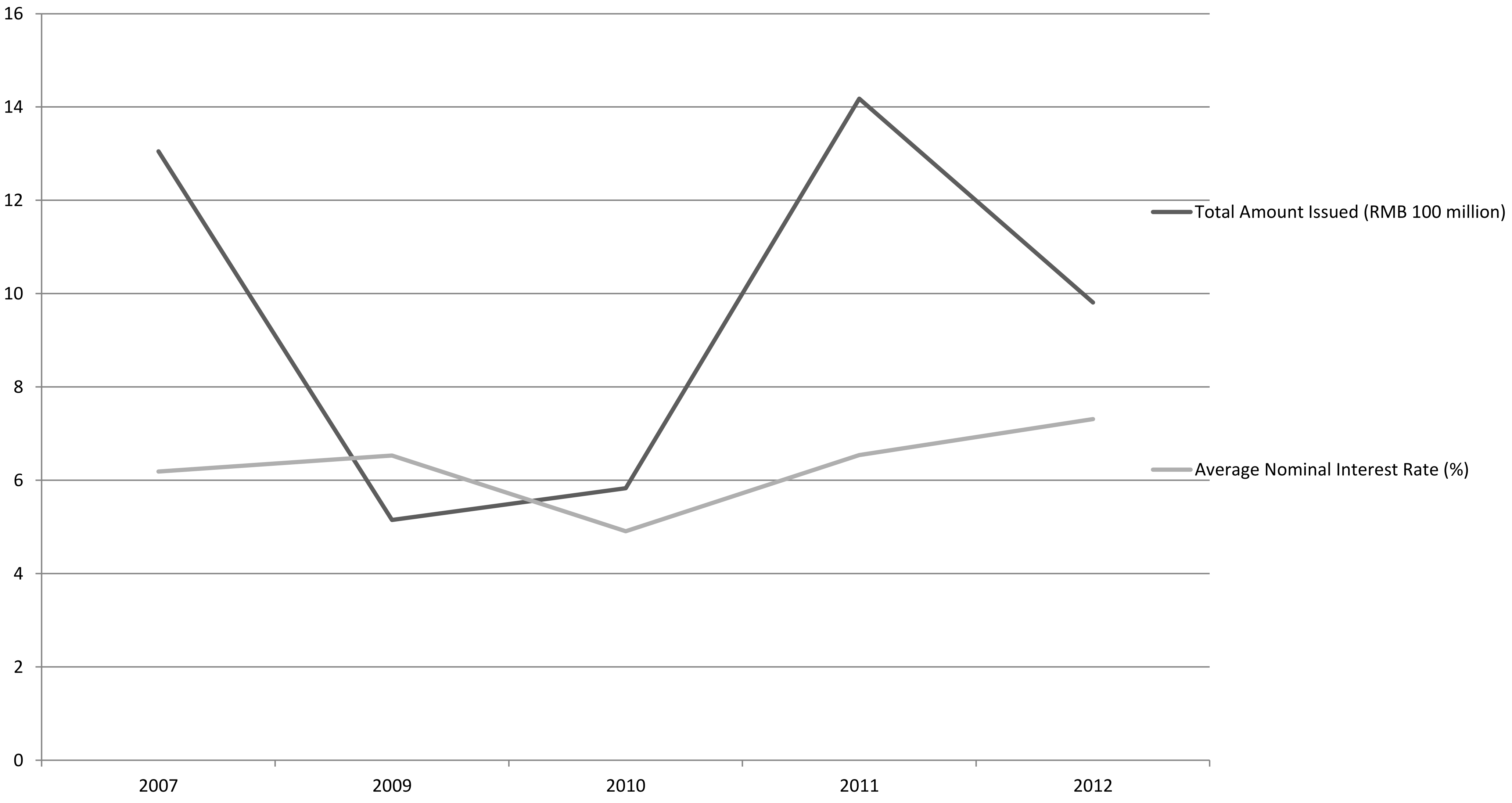
**Data source: World Bank Enterprise Survey 2013**

## Table 8. Increase in Chinese MSE* and SME** Financing in 2013 (Unit, 100 million RMB)

| | |
|---|---|
| Increase in outstanding bank loans to MSE | 29900 |
| Market capitalization increase in SME board | 8400 |
| Market capitalization increase in GEM board | 6268 |
| Stock Market Refinancing | 524.58 |
| VC investment | 419.87 |
| Private Placement MSE Bonds | 259.65 |
| Collective SME Note | 60.39 |
| Increase in P2P lending | 212 |
| | |
| MSE*-micro and small sized enterprises<br>SME**-small and medium sized enterprises | |

Sourse: Wind Info, People's Bank of China, China MSME Finance Report 2014

# Figure 2  SME collective Bonds Issuances (2007-2012)



# High-tech Pecking Order Financing in China

- The findings show **also the importance of informal financial** sources from **moneylenders, friends, relatives, individuals and firms' employees for high-tech SMEs (cf. TAB. 4).**
- **Such sources have become a central aspect of the financial infrastructure for the high-tech sector in China (cf. Li Xiao, 2011). Informal suppliers** were typically **owners of existing high-tech business** who have the appropriate knowledge to evaluate the targeted projects.

- However as point out again by Li Xiao (2011, p. 224) , "the lack of **any legal status of informal finance** and practical **knowledge of investing in small businesses** may mean that *individual investors* **prefer to provide funding with short-term finance** and **in small amounts to high-tech SMEs at all stages of business development"**.

# CONCLUSIONS

- The aim of this study **was to investigate the availability and nature of various sources of finance** for **innovative Chinese SMEs** during the **business development.**
- The overall findings are that the **scale and diffusion of venture capital** activity in China **remains limited even if the situation seems to improve** (see TAB. 8), **self-finance and informal finance from individual investors and private firms are consistently the key sources**, with **bank finance yet to become significant** sources, particularly at the start-up and early stages.
- In summary, **innovative SMEs in China, compared to technology-based small firms in western countries**, **have fewer formal sources** of finance available and may have a need **for medium and long-term financing**.

# CONCLUSIONS

- Although **this reliance on self-financing is in compliance with** the position **in other developed countries**, a **distinctive feature in China is that informal suppliers of finance generally act as a substitute for the more formal financial providers, i.e. the banking sector.**
- This is consistent with previous empirical findings in China (Tsai 2002, Li Xiao, 2011) that **the SMEs private sector** has been sufficiently funded **by informal sources of finance**.
- The **firms involved** found **the informal sources of finance** more appropriate than formal ones in satisfying their needs although this involved **utilizing the founder's existing social networks** to gain access to informal sources.