How to Improve M&A Loans in China: A Comparison and Risk Management Angle

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ABSTRACT

China is actively leading the Asia-Pacific M&A market with an ascending trend of transaction volume and $770 billion transaction volume in 2016. This trend makes financing fundamental, which affects acquisition scale, structure, consequence and even post-acquisition integration. M&A loans, launched in 2008, have become the most utilized pattern of M&A financing in China. Though it develops fast, multiple problems exist in practice. My research focuses on how to improve M&A loans by solving these problems. To compare the practice in the US and China's M&A lending markets, I explained the four main business models of M&A loans in China and illustrated the bank debt financing in LBO deals in the US. Based on the comparison, I maintained that the main reasons for the defects lay in both macro and micro levels and accordingly made suggestions. Especially, improvement in risk management would allow confidence in business development and product innovation. Thus the problems of credit preference and product homogeneity could be eased. I illustrated utilization of multiple models with a real case. The study also includes empirical and scenario methods in analysis.

Thesis Supervisor: Mark P. Kritzman
Title: Senior Lecturer in Finance at MIT Sloan School of Management

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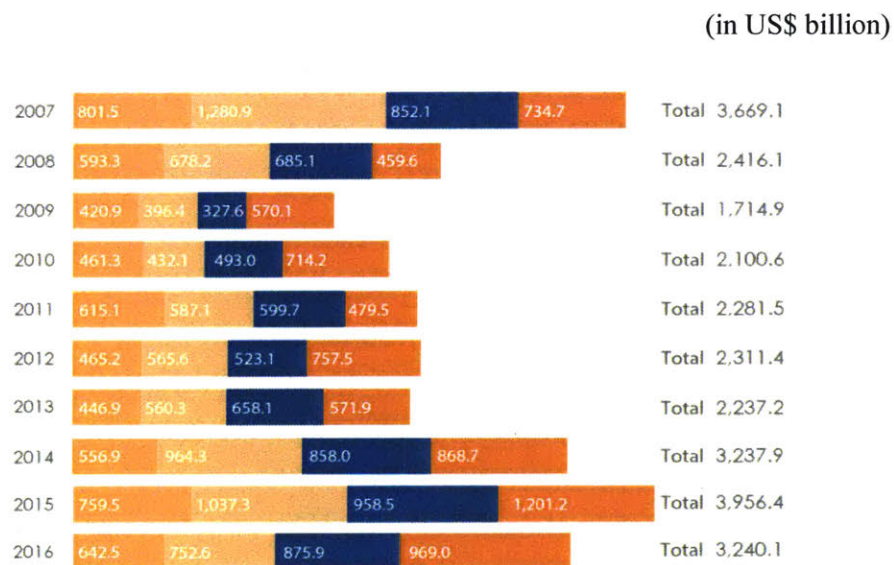
Table of contents

Chapter 1: Background

1.1 A Booming M&A market

M&A has been a household word for the past century. It seems that the uncertainty of the economy has not affected the enthusiasm in the investment of M&A market. In 2016, 17,369 deals were carried out globally, involving the value amount of as much as $3.2 trillion, 63.8% of which were announced transaction values of over $1 billion. Even though the number is not as astonishing as it was in 2015, it still provides a strong proof of the M&A trend.

Figure 1. Global M&A transaction value by quarter (2007-2016)

(in US$ billion)

Year	Q1	Q2	Q3	Q4	Total
2007	801.5	1,280.9	852.1	734.7	Total 3,669.1
2008	593.3	678.2	685.1	459.6	Total 2,416.1
2009	420.9	396.4	327.6	570.1	Total 1,714.9
2010	461.3	432.1	493.0	714.2	Total 2,100.6
2011	615.1	587.1	599.7	479.5	Total 2,281.5
2012	465.2	565.6	523.1	757.5	Total 2,311.4
2013	446.9	560.3	658.1	571.9	Total 2,237.2
2014	556.9	964.3	858.0	868.7	Total 3,237.9
2015	759.5	1,037.3	958.5	1,201.2	Total 3,956.4
2016	642.5	752.6	875.9	969.0	Total 3,240.1

Source: Mergermarket

Regionally, the US kept leading the global M&A market, with a total transaction value of $1.9 trilllion, accounting for 59% of the total volume. On other hand, China was actively leading the Asia-Pacific market, with 11,490 deals and $770 billion in 2016. This record is 21% in deals and 11% in value higher than it was in 2015.

Figure 2. China's booming M&A market (2012-2016)
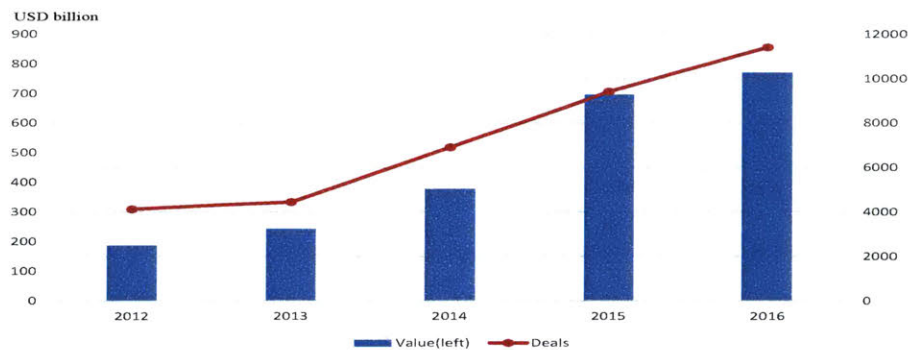
Source: PWC

Though the Chinese government has recently made a U-turn by announcing several restriction regulations, there is no doubt about the ambition and necessity of the Chinese M&A market. The ascending trend of transaction volume can be predicted from the need of globalization and internal improvement of Chinese corporations. Among the top five M&A deals last year, Chinese corporations again showed their passion for the M&A market by investing $45.9 billion to get a top five slot.

Table 1. Top 5 M&A cases in 2016

Deal value(US$bn)	Ann.date	Bidder company	Bidder country	Target company	Target country	Target sector
105	22-Oct.	AT&T Inc	USA	Time Warner Inc	USA	Media
63.4	14-Sep.	Bayer AG	Germany	Monsanto Company	USA	Industrials&Chemicals
51.4	21-Nov.	Sunuco Logistic Partners LP	USA	Energy Transfer Partners LP	USA	Energy, Mining&Utilities
45.9	27-Oct.	Qualcomm Inc	USA	NXP Semiconductors NV	Netherlands	Telecommunications
45.9	3-Feb	China National Chemical Corporation	China	Syngenta	Switzerland	Media

Source: Mergermarket

It is obvious that companies are exerting themselves in searching for different sources of financing to fulfill such large volume of transactions. Acquisition loans are playing an important role in both American and Chinese markets. About 30%-50% of the financing come from loans in the US market. In China, M&A loans have developed

5

rapidly ever since 2008 when the Chinese regulators started to permit such products. Commercial banks that were struggling to find a new business growth point under the gradually narrow interest gap environment were excited. Corporations that needed money to merge or acquire also grabbed this opportunity to expand.

1.2 The development of M&A loans in China's market

Permitting M&A loans in China is like refreshing rain after a long drought. For quite a long time, the borrowers were not permitted to use the loan to engage in equity investment per the law made by China Central Bank. On December 6, 2008 China Banking Regulatory Commission (CBRC) announced "Guideline on Risk Management of M & A Loans in Commercial Banks" ("Guideline"), marking when the M&A loan business was officially thawed after a 12-year period. And it seems that it was the right time for the announcement since China had just been in the ascending economic cycle with great supply and demand of M&A loans (Figure 3).

Figure3. A friendly environment for M&A loans' launch in China
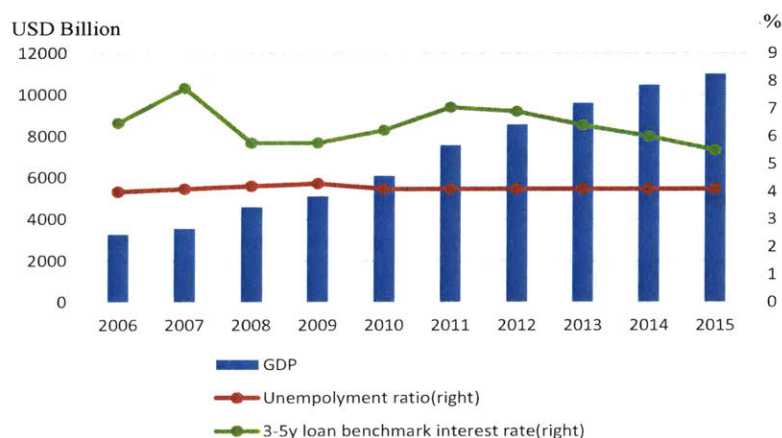
Source: World Bank, China State Statistical Bureau, PBC

In 2015, CBRC modified the "Guideline" to facilitate the "going-out strategy" of Chinese corporations. The main changes are in three aspects: The leverage ratio ceiling

was raised from 50% to 60%; the longest term of loan was extended from 5 years to 7 years; warranty requirements were moderately adjusted, allowing more flexibility for the banks' decisions on the collaterals. With these policy benefits, M&A loans developed fast. Banks moved more quickly in cross-border M&A financing. It is said that China's banks helped finance $157 billion M&A projects in 2016. And the nation's lenders led $19.9 billion of global syndicated loans for M&A, accounting for 4.4% of the total market.

Figure 4. Lending by Chinese banks for global mergers and acquisitions
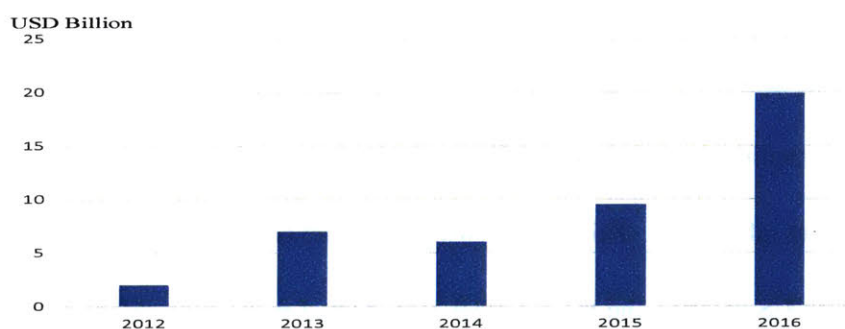
Source: Bloomberg

However, problems also have shown up. SMEs that are in great need of integrating their business to realize economy of scale find it hard to get sponsored by commercial banks. On the other hand, commercial banks' business gets restricted by the capital limit, which means small banks are usually excluded from M&A business. The big commercial banks are still searching for creative ways to balance the risks and the development of business, being more selective when they make the lending decision. Additionally, the products are to some extent again falling into a homogeneity pitfall. In general, there are multiple problems to be solved in China's M&A loan market, especially when they get much more involved in the international market.

1.3 Meaning of research and methodology

The growth of M&A loans is not in line with the risk management ability of China's commercial banks. They do not have much experience in mergers and acquisitions but have to get involved deeply in both China's and the global market. Thus how to manage risks during the process of developing business, how to solve the mismatches of demand for funds and supply, and how to make M&A loans utilized properly in the strategic integration of enterprises are critical issues to work on. However, current research on this topic is relatively limited. And in those existent articles, they are constrained on interpreting the regulations or mainly utilizing qualitative analysis about the risks, lacking forward-looking and quantitative management.

In this thesis, I examine the deficiency of China's M&A loan market, and argue that the risk management ability is critical for sustainable development. Based on the comparison with US practice and the practical case study, I make suggestions on how to improve the acquisition loan financing transaction structure, and utilize different risk management tools. The main methodologies include comparative analysis, case study, empirical and scenario analysis, and model utilization.

Chapter 2: Literature review

2.1 M&M and financial stress cost theory

In M&M (1963), Modigliani & Miller relaxes the assumption of no taxes and maintain

that capital structure does matter in the real world with corporate income taxes, since

interest payments are deductible for tax purposes. Tax deductibility means that interest

is treated like expenses and would be a deduction from revenue before computing

taxable profits. On the other hand, dividends are distributed to shareholders from after-

tax funds. In this way, corporations that finance assets with debt actually have a tax

shield.

However, taxes are not the only consideration when companies decide their ways of

financing. Paul Asquith (2016) believes that if a firm's debt burden is too high, they

may suffer from financial distress and the debt holders could force the firm into

bankruptcy. He argues that the problem with increasing the level of debt is that it also

increases the risk of financial distress. This means that there is a point at which the

firm's debt reaches a level where the tax shield equals the increase in the expected costs

of financial distress. In other words, the company has optimal capital structure at that

point.

In the M&A practice, the acquiring company also should take the financing pattern (i.e.

equity or debt) into consideration. An acquisition loan is to some extent much cheaper

than equity financing but could also cause payment issues. The banks, on the other hand,

should pay great attention to the financial status before granting loans.

2.2 Acquisition lending

The M&A loan is a comparatively new concept in China. It was first mentioned in the

CBRC regulations in 2008. Scholars in China have done much work in interpreting this programmatic document. In *Research on the Policy of M & A Loans*, Kejin Wang (2010) argues that the M&A loan has a broad definition per the regulations since the scope of M&A given by the authority is wide. Mergers and acquisitions include all the activities by which enterprises achieve the merger or actual control of established target business by transferring of existing shares, subscribing new shares, acquiring assets, or assuming debt. The M&A loan is the loan utilized in the above process. Also scholars have done much research on how the loan is different from other kinds of loans and provided general suggestions in managing multiple risks such as strategy, integration, and legal etc. risks. For instance, in "Commercial bank annexation loan risk management," Yuan Lu (2014) maintains that the risks in M&A loans could be identified as strategy risk, legal risk, synergy risk, operation risk and financial risk. But most of the articles failed to provide quantitative risk management measures.

In the US, debt funding also plays an essential role in the M&A process. Commercial banks mainly help LBO buyers with leveraged loans. Glenn Yago and Donald McCarthy (2004) introduce the development history of M&A lending in *The US Leveraged Loan Market: A Primer*: In the mid- to late 1980s, the boom in M&A and leveraged buyout activity involved development of the syndicated loan market. The LBO syndication loan rose to nearly $100 billion in 1988. The primary syndicated loan market came to a close in 1989 when the authorities provided guidelines regarding highly leveraged transactions (HLT), which limited banks' holding HLT loans. In the mid- to late 1990s, borrowings for M&A and LBO activities again became popular in

the primary syndicated loan market, reaching a peak amount of nearly $300 billion in 1999. The loans are usually syndicated, i.e. they are not actually funded by the commercial banks but are instead split up and sold off to other financial lenders such as collateralized debt obligations funds and other institutional investors.

2.3 Classical theories on financial risk management

William F. Maxwell and Mark R. Shenkman (2010) divided the quantitative models that have been developed to estimate default probabilities into two broad categories: fundamental-based models and market-based models. The former relies on account and economic information and the latter relies on security prices. The most commonly used fundamental based models are Altman Z-score and Piotroski's F-score.

Altman Z-Score was one of earliest successful attempts to use financial ratios for bankruptcy prediction. It included five ratio combinations and provided three intervals to describe the possibility for a company to get into financial stress. This model is widely utilized in analyzing the credit risk.

Piotroski's "financial health" F-Score is an investment scoring metric that uses public financial statement data. It helps "identify firms with the strongest improvement in their overall financial condition during the last fiscal year while meeting a minimum level of financial performance." It uses most recent annual data to assign 1 point for "true" value and 0 for "false" value. According to Piotroski, an F-score of 7, 8 or 9 indicates strong and improving financial performance, whereas a score of 1, 2 or 3 indicates weakening financial performance.

2.4 Synergy value

Concepts of Synergy are basically similar in different theories-- the additional value

that is generated by combining two firms. Per *Applied Mergers and Acquisitions*, Robert F. Bruner (2002) maintains that value is created when the returns on the investment exceed the returns required. In "How do Mergers Create Value?" Houston, James, and Ryngaert (2001) believe that the expected synergy comes from forecasted cost savings and revenue enhancements after research in bank mergers. In "Focusing versus diversifying bank mergers: analysis of market reaction and long-term performance", Gayle L. DeLong (2001) also studies bank mergers and finds that investors respond positively to the signs of synergy gains. In *Principals of Corporate Finance*, Brealey, Myers& Allen (2012) argue in the 'Mergers and Economy' chapter that a merger generates synergies if the two firms are worth more together than apart. Gain=$PV_{AB} - (PV_A + PV_B) = \triangle PV_{AB}$.

Chapter 3. Problems in today's M&A loan market in China-A comparison angle

3.1 How do M&A loans work?

3.1.1 The business models in China

M&A loans are issued for financing M&A transactions. One of the most distinguished characteristics of M&A loans is that they are involved in complex M&A transactions. The processes are affected by multiple external factors. The business models of M&A loan in China could be divided into the following categories based on transaction complexity.

 a) Plain Bilateral M&A Loans

Plain bilateral M&A loans are granted to acquiring companies to finance the acquisition. The typical transaction structure is illustrated in Figure 5 below. In the current regulations, authorities show more concerns about this product: First, usage of loans has to follow strict terms and conditions, i.e. plain bilateral M&A loans can only be drawn down for long-term strategic acquisition or mergers instead of short-run arbitrage transactions. At the same time, the regulators encourage the loans should be used in industries which fit the national industrial policies, environmental policies and banks' credit policies. Meanwhile, assets of the target companies are usually pledged as collateral to banks to secure the loan. Also, specific requirements are clearly put forth in terms of financial leverage ratio and single obligor exposure. More specifically, M&A loans should be accounted for less than 60% of the total financing resource, and the balance of M&A loans to the single borrower shall not exceed 5% of the Bank's core net capital in the same period. With more uncertainties, commercial banks charge

higher for reward. Interest rates are usually 30% higher than the benchmark. In certain cases, banks may require performance guarantee or fund supervision for added level of comfort.

Figure 5. Typical deal flow of the plain bilateral M&A loans
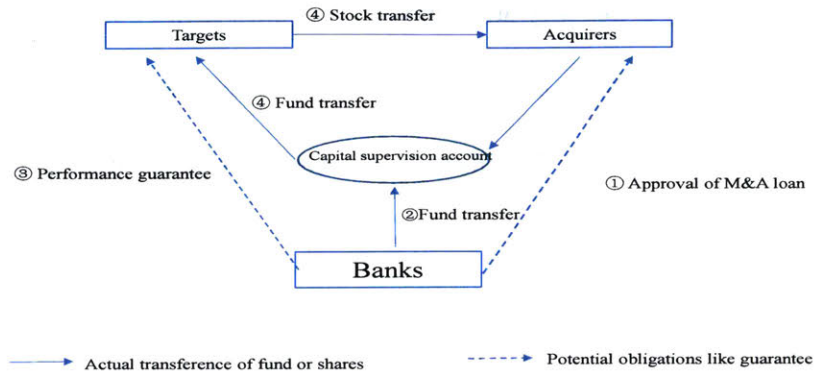
b) *Syndicated M&A Loans*

Syndicated loans are frequently used in the M&A field when banks try to diversify risks. Led by one or several banks, a group of banks and non-bank financial institutions will provide M&A loans to the same borrower under the same agreed terms and conditions. Figure 6 shows a typical structure of this pattern. To the syndicate, the benefit of syndicated loans lies in diversification, as well as opportunities to participate in M&A loans, which could not be financed through a bilateral arrangement due to capital-asset ceilings. In most cross-border M&A transactions, the loans are provided through syndication.

Figure 6. Typical deal flow of the syndication M&A loans
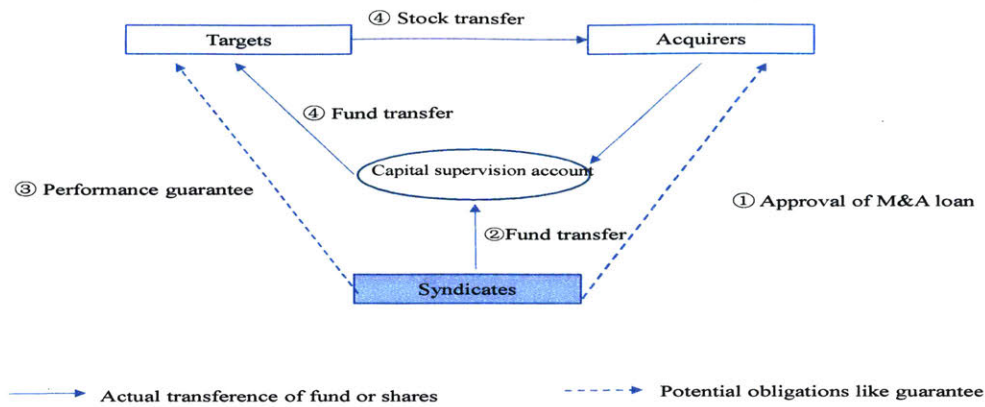
c) *Offshore M&A Loans with Onshore Guarantee*

Offshore loans with onshore guarantees (commonly known as "Nei Bao Wai Dai") are widely used in cross-border M&A transactions. Onshore guarantor, through an eligible financial institution in China, provides offshore banks with a corporate guarantee or security arrangement for the M&A loan granted by the offshore banks. Figure 7 shows the typical way of overseas M&A loans under domestic guarantee.

Figure 7. Typical deal flow of offshore M&A loans with onshore guarantee
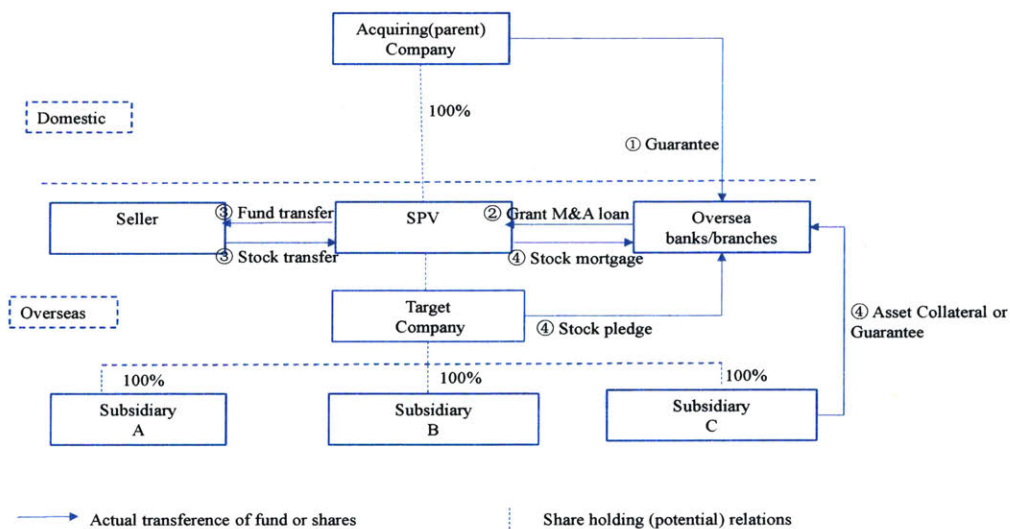
It takes an alternative path in Free Trade Zones (FTZ) (Figure 8). M&A loans could be

issued directly to Free Trade Non-resident (FTN) accounts owned by the entity abroad. In other words, this is actually a domestic loan utilized to fund cross-border M&A projects under a domestic guarantee. Utilizing the preferential policies in FTZ, the acquirers could benefit in two ways. First, the borrowers and guarantors need not register or report to State Administration of Foreign Exchange (SAFE) except in special situations. This is a substantial convenience under the strict FX examination and approval registration system in China. Meanwhile, under the "one project, one discussion report," the ceiling of leverage (60%) could possibly be surpassed.

Figure 8. FTZ M&A loans under domestic guarantee
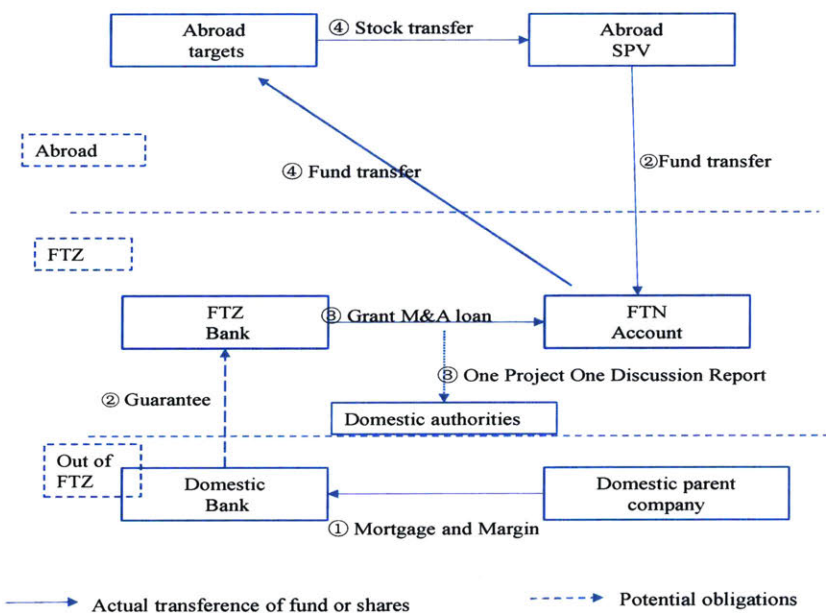
At the beginning of 2017, authorities liberalized the return of foreign funds in overseas loans under domestic guarantee. This modification would expand the utilization of this business model. But more attention should be paid to the regulatory arbitrage.

d) *Bank-trust cooperation M&A loans*

Trust companies, as the only legally eligible organizations besides banks to issue loans in China, have played an essential role in China's capital market. As for M&A loans, trust companies lend money directly or cooperate with banks that are more restricted in issuing loans. This business model is often utilized when commercial banks encounter difficulties lending money directly. Such constraints exist when borrowers are Small and Medium Enterprises (SMEs), which could not meet the qualified borrower standards, or regulations forbid or limit the issuing of loans in certain sectors. [1] However, interest rates are generally 2%-3% higher than in common situations since they also include the payment to trust companies. The bank-trust cooperation pattern is illustrated in Figure 9.

Figure 9 Typical deal flow of bank-trust cooperation M&A loans
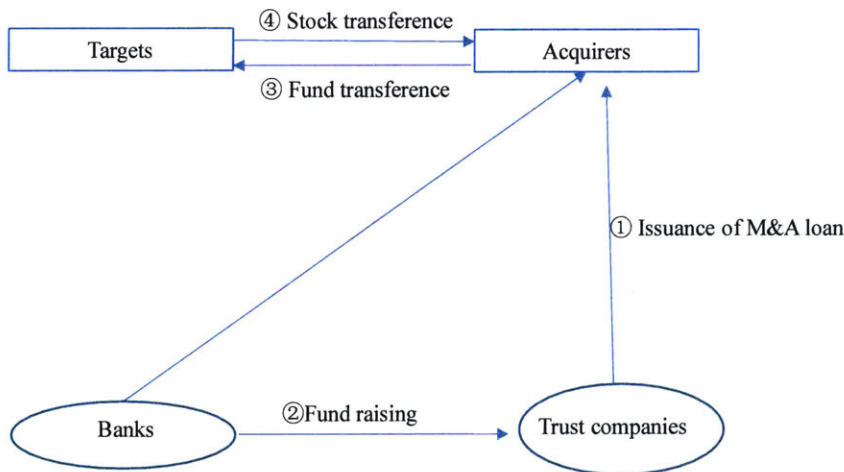
3.1.2 Bank debts in the American M&A market

Bank debt financing also plays an essential role in the American M&A market. Compared with the practice of M&A loans in China, the bank debt market in the US is

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[1]   In 2014, M&A loans in real estate industry were strictly regulated by the authorities, leading the obvious increase of bank-trust cooperation loans.

more sophisticated with multiple participants, diversified products and a hierarchical financing structure.

Considering the increasingly important role of LBOs in the M&A landscape, I illustrate the bank debt in American M&A market with LBO financing. Joshua Rosenbaum and Joshua Pearl (2013) maintain that debt accounts for 60%-70% of financing structure in a traditional LBO. The debt portion is composed of a broad array of loans, securities, and other debt instruments, all of which have relative rankings. Bank debt ranks high in this hierarchical structure, consistently serving as a main source of financing (Figure 10).

Figure 10. Average source of LOB proceeds 2003-2012
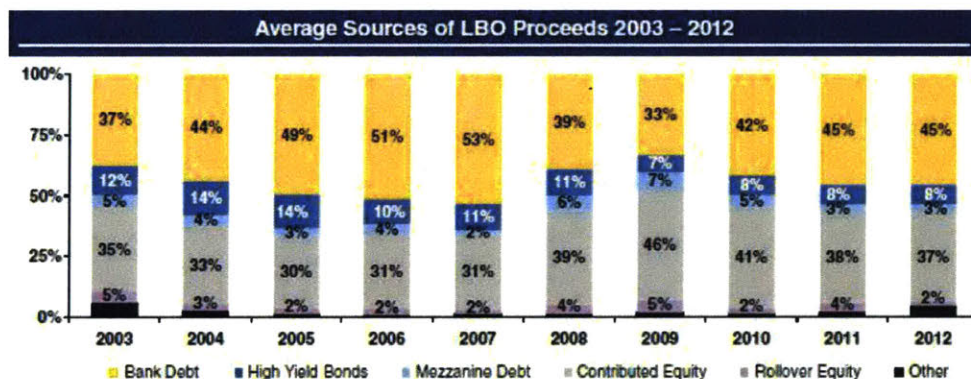
Source: Standard &Poor's leveraged Commentary &Data Group, *Investment Banking*

Bank debts could be classified into two large categories: revolving credit facilities and term loan facilities, depending on whether the borrower is required to repay a fixed amount of principal over a specific period of time. Revolving credit facilities allow borrowers to draw varying amounts. They are usually syndicated to a group of commercial banks and finance companies. Since lenders generally require a first priority security fee to guarantee an advantage in the event of bankruptcy. They

compromise on the cost, making it the least expensive funding resource. When the facilities are secured by a first priority lien on the borrowers' current assets like accounts receivable and inventories, they are named asset-based lending facilities (ABL facilities). ABL facilities provide lenders with extra protections, which are easily turned into cash in the bankruptcy. Thus the financial maintenance covenants could be slightly relaxed. Term loans require principal repayment periodically in the process and cannot be re-borrowed after repayment. Depending on the difference of participants, amortization schedule, maturity date etc., term loans can be classified into three different types.

Table 2. Different types of term loans

Term loans	Investors	Amortization schedule	Typical maturity term
Amortizing term loans	commercial banks and finance companies	substantial principal repayment	five years
Institutional term loans	institutional investors	amortize at a substantially lower rate with a bullet payment at maturity	up to seven years
Second Lien term loans	hedge funds and CLOs	do not amortize	longer than in first lien term loans

Besides the diversified loan products, multiple financing methods have been developed. Public low graded debt, or junk bonds, became popular in the 1980s. Deferred interest debt increased after 1984, further "juniorizing" the subordinated debt. Kaplan &Stein (1991) argue that this process potentially transferred value to the senior bank lenders. The development of non-bank institutions adds to the diversification of LBO financing. The secondary syndication loan market boomed in the early 2000s, allowing for banks with more liquidity and risk transference. Mezzanine debts provide extra access to financing especially for SMEs.

Figure 11. Structured LBO financing market
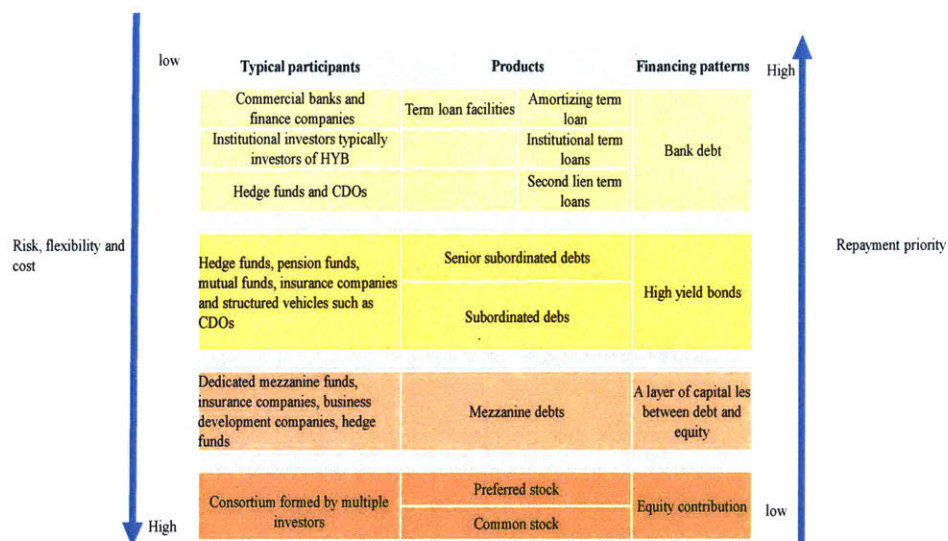
It is hard to weigh the pros and cons of the structured financing especially after the subordinate debt crises. However, we have to admit that the American M&A financing market is comparatively mature, providing more flexibility and accessibility to multiple investors with different risk appetites and return requests. Especially, bank debts in the American M&A market have been structured considering the demands of borrowers and the characteristics of the suppliers.

3.2 Problems about M&A loans in China

3.2.1 Limited participants

Compared with the related business in the American market, China's M&A loans have few participant categories. On the demand side, private enterprises still face financing constrains. State-owned companies and large corporations remain the key players ever since the launch of M&A loans. Private enterprises face financing difficulties due to constrained borrowing channels, especially for cross-border M&A financing which is the most obvious challenge for private enterprises. On the supply side, commercial

20

banks are the main resource of M&A loans. However, trust companies, the only legal lending institutions besides commercial banks, have played an increasingly important role in the process, often act as an alternative resource of financing. Limited availability of suppliers aggravates the difficulty of private enterprises receiving M&A financing.

3.2.2 Lack of diversified products

Though M&A loans developed fast since 2008, they still face product homogeneity issues. Differentiators among banks offering M&A loan products are mostly around price, scale and lender reputation, instead of product features.

The limited product suite of M&A loans offered by commercial banks, on the other hand, provides opportunities for trust companies. This situation happens especially when there are sector policies or borrower-specific restrictions that commercial banks must adhere to in order to stay in business. For instance, the Chinese government recently restricted non-standard financial products in the real estate industry. Companies started to avoid the regulations by using bank-trust cooperation M&A loans or M&A loans issued by trust companies directly. Resource of funds is sometimes the wealth investment products issued by the commercial banks. Though banks treat it as off-balance sheet activity, they are nonetheless exposed to the risk due to the rigid redemption principle in China's capital market. Authorities have enforced many regulations on potential shadow banks. However they remedy problems after the fact.

Figure 12. A typical bank-trust cooperation path
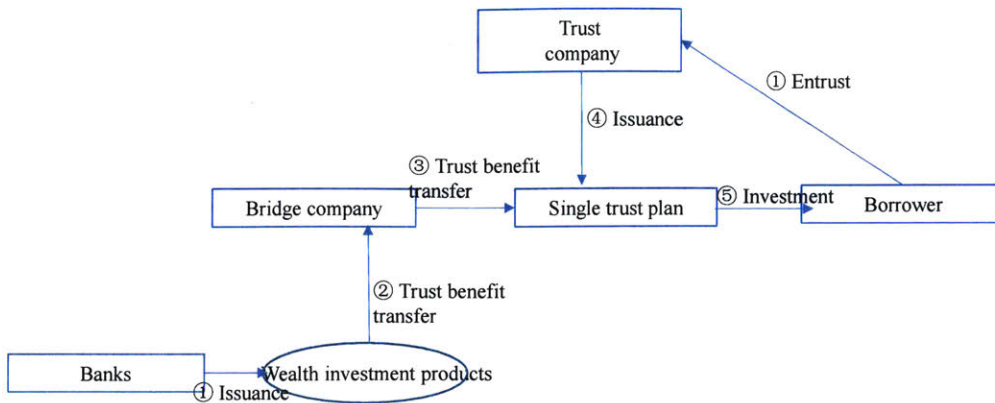
3.3 Reasons underlying these problems

3.3.1 Restrictions and preference of authorities

Among the reasons that led to limited participants, two of them are fundamental: credit preference and "separate operation" regulations.

Credit preference is the main form of financing constraints in China. This could be seen in two aspects--lender qualification and the preference of industry. First, the state-owned companies have priority in the access to M&A loans. Though there is no obvious requirement in CBRC regulations, the preference to state-owned companies over private enterprises still exists in practice. For instance, per the "Guidelines on Risk Management of M & A loans" (CBRC, 2015), commercial banks should in principle require borrowers to provide sufficient guarantees to cover the risk of M&A loans. In practice, the government as a guarantor almost became a "necessary" condition for M&A loans. This actually blocked many private enterprises. Based on my years of experience in commercial banks, risk managers would be more cautious when it comes to the review of M&A loans to private enterprises. Banks usually clearly state in the internal rules that they would preferentially support M&A of large-scale state-owned

enterprises and other large enterprises and preferentially support strategic M&A of good efficiency, the industry vanguards, and high-tech enterprises. State-owned companies with government background or even financial support or guarantee from government would have priority over private companies. Secondly, the credit preference could also be seen in the industry selection. This actually could be easily seen from the regulations. Per "Guidelines on Risk Management of M & A loans" (CBRC, 2015), commercial banks should constantly optimize the loans by actively supporting optimization of industrial structure and destruction of excess capacity ones. In practice, banks consider whether the M&A business is consistent with national industry and environment policies.

Separate operation and management financial systems have existed since 1995 in China. It is commonly accepted that there are three levels of separation: separation of financial and non-financial industries; separation of sub-sectors like the commercial banks, securities and insurance; and separation of related business inside commercial banks, securities and insurance. This system could provide certain convenience for the regulators, but it also brings obstacles to the financial institutions' cooperation and innovation. Some institutions fail to innovate because of the business scope restrictions; some institutions are spoiled by the exclusive business authorization and lack motivation to innovate. This could also explain limited product suites.

3.3.2 Undeveloped capital market in China

It has been highlighted in the Chinese government annual reports that China has to build up a diversified and structured capital market. Steps like encouraging over-the-counter

market (OTC market) have also been taken. But a fundamental reform is still in demand. First, investors need to be diversified, especially institutional investors. It is a common phenomenon that the participants are limited in China's investment field. If we could have diversified sponsors with different risk appetites and return expectations, it would be easier to improve the liquidity and funding resources. Just as in the situation in the American M&A debt market, institutional investors play an important role in making the loans structured. Second, more innovative financing channels should be developed. The derivative market in China is still in an early stage of development. The junk bond market has not risen. As Xiaoling Wu argues,[2] the most serious problem in China's M&A market is not high leverage level but the extreme difficulty in issuing bonds for M&As.

3.3.3 Risk management ability is inadequate

Most of the commercial banks involved in the M&A financing process have noticed the importance of risk management. Internal rules have been made based on the regulations of CBRC. However, risk management is still in an early stage, leaving multiple aspects to be improved.

Most commercial banks in China have developed standards and requirements in the whole process as what they did in the other product. However, qualitative standards are more than the quantitative ones. The thresholds rely severely on the borrowers' background and the historical data in a related industry. For instance, banks tend to be selective in choosing projects. Borrowers with state-owned background that are in line

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[2] Xiaoling Wu's lectures, 2010.

with the national industry policy could be admitted much more easily. Also, synergy analysis is mostly based on historical data in certain industries. When it comes to the risk mitigation methods, they are constrained by the traditional methods like mortgage. Methods involving derivatives have seldom been utilized in hedging the risk. The inadequacy of risk management ability to some extent intensifies problems in M&A loans. Commercial banks tend to be more cautious and selective in the customer access process, blocking more SME borrowers that fail to match their strict filter standards. On the other hand, more off-balance business, wealth management products, are utilized, which probably incur more risks.

3.4 Suggestions for a better M&A loan market in China

To improve the M&A loan market is a grand project, which requires multiple parties' efforts. My suggestions are presented at macro and micro levels.

3.4.1 Macro level suggestions

The improvement of M&A loans needs a better external environment. To ameliorate the capital market in China, I have suggestions in three aspects.

The pros and cons of separate operation in China's financial market have long been discussed. Probably some revelation could be found in the history of the US financial market. In 1933, the Glass-Steagall Act (GSA) separated investment and commercial banking activities after the stock market crash in 1929 and extensive commercial bank failures. Though the act was considered harsh by most of the financial community, more walls were built between insurance and banking in 1956 per Banking Holding Company Act (BHCA). However, more arguments emerged on whether the GSA and BHCA

made the banking industry riskier or safer. Then the Gramm-Leach-Bliley Act was enacted in 1999, ending the separation of business in US financial market. In the words of Reem Heakal (2015), the reasons for the repeal of GSA and the establishment of GLBA showed that even regulatory attempts for safety can have adverse effects. It is argued that situations may be different in the Chinese financial market. But the drawbacks of separation of business have already shown. With the repeal of separate operation, banks could have more incentives in product innovation; information would be more accessible since banks could get involved in the M&A activity in earlier stages. Without the restrictions on the equity investment, banks could take over the management of enterprises by holding their stocks, which is another effective way for risk prevention and mitigation. In general, I believe that the mixed operation would bring more flexibility for the banks, allowing a healthier innovation environment.

Second, authorities should take more measures to activate and regulate institutional investors. China currently has multiple institutional investors including insurance companies, trust companies, securities, fund companies, social security funds, commercial banks, etc. It seems little difference with the developed capital market based on the categories. However, the institutional investors have played less important roles in both the equity and debt markets. As of 2015, institutional investors held only 7% of shares in Shanghai (A) Stock Market, comparing with those who held 45.83% of shares in American market. Situations are even worse in the debt market. Commercial banks have consistently been the largest holder with no less than 60% shares in the bond market. When it comes to the intro-bank bond market, commercial

banks also hold a majority of the bonds, which means the risk is still kept inside the banking system. Also China's pension market is far from mature, with multiple problems to be solved. Reasons lie deeply in the system policy. China's authorities should improve pension management by providing tax incentives, a transparent management system and professional managers. Also, it is also important to loosen the rigid redemption principle, which is a temporary measure in the capital market with a majority of individual investors.

Third, a structured and layered capital market should be built to satisfy different investors' risk appetites. Monotonous indirect financing is still the mainstream in China today. Though the short developing history of China's capital market may justify this, authorities should still take fundamental measures to change the situation. For instance, unity and synergy in the bond market should be rebuilt by fixing the fragmentation led by the four regulatory divisions. A junk bond or high yield bond market should be developed to cater to different investors' requests, bringing more resources to the SMEs. The social security funds' participation in equity investment should be facilitated. M&A equity fund with more influence in the board of companies should be developed. In general, a mature capital environment is one of the main prerequisites for improving M&A loans. This aim cannot be attained in a short time and needs multiple parties' effort. Authorities need to exert fundamental reform to accelerate the process.

3.4.2 Micro Level Suggestions

In the micro level, commercial banks could still make improvements. My suggestions include the business development and the risk management dimensions. The latter is

more practical and fundamental in the current environment with many constraints of product innovation.

As for the business development, banks should diversify both products and services. In the product level, more flexible terms and interest rates could be developed to cater to different client needs. Recently the authorities changed the longest term of M&A loans from 5 years to 7 years, which is more in line with M&A practice. However, the terms of the loans need to be structured. For instance, loans with multiple interest rates, mature terms, and priorities of claims on collateral could be combined into a portfolio to a single lender. Revolving facilities could also be utilized based on periodical evaluation of inventories and receivables. In this way, customers could be encouraged to get the loan that fits their request best. The banks could get more rewards per the price discrimination. In the service pattern, banks could improve the finance advice. Being a finance advisor means that the banks could be involved in the M&A process much earlier. This would provide more inside information of the M&A process, which may not be accessible if the banks work only as lenders. Currently, some banks have already started this business. However, they have not shown competitive advantage in the service ability compared with investment banks. So in the near future, developing the ability of banks to act as financial advisors is still needed.

More fundamentally, commercial banks should improve their risk management capability. This is the prerequisite for banks to carry on innovative business in both current and future environments. First and foremost, more cautious review should be exerted on M&A projects. One of the most important characteristics of M&A loans is

that they rely heavily on the success of the M&A activity. Currently, banks usually care more about the quality of acquirers when make approval decisions. Acquirers with state-owned background or in line with the government's preference would probably get supported by banks. Sometimes risk managers even do not conduct onsite due diligence when the target companies are abroad. I suggest that it is important for the risk managers to have independent first-hand information. Meanwhile, more quantitative techniques should be utilized in the whole process. Per my experience and the surveys to related practitioners, though they do have models in current practice, valuation and quantifying risks remain the largest challenges for the risk managers. Considering the importance and the practical ways to improve, I will further discuss risk management aspects of M&A loans through a case study in the next chapter.

Chapter 4. How to manage substantial risks in M&A loans: Case study approach

As stated in the previous chapter, one of the substantial deficiencies in current regulations is that there are few specific and quantitative standards for the commercial banks to follow. It is said that banks should evaluate operation and financial risks, and regularly assess the future cash flow and the stability of the two sides. However, no specific requirements have been set. In practice, banks tend to neglect the evaluation of a target company or fail to carry out risk management in a quantitative way. My main idea is to suggest that banks recognize, quantify, monitor and manage the substantial risks in M&A loans under a thorough understanding of deal flow and transaction conditions.

In the following part of this chapter, I will illustrate the process of risk analysis with a real case. The standards of choosing the case lay in the following four aspects. Firstly, M&A loans played an essential role in the M&A process. Secondly, M&A loans were arranged in a typical way, which could represent most similar cases. Thirdly, at least one party is a public company, which provides the access to performance records. Fourth, the project has been completed and would serve well for further suggestions on risk management. Based on the above standards, I chose the case of Jiangsu Changjiang Electronics Technology Co Ltd (JCET) vs. STATS ChipPAC Pte. Ltd. (STATS).

4.1 Basic information

4.1.1 Acquiring and target companies

The acquiring company, Jiangsu Changjiang Electronics Technology Co Ltd (JCET), was founded in 1972 in Jiangsu, China. JCET (transaction code-SHSE: 600584) went

public on the Shanghai Stock Exchange in June 2003, with 85,313 million outstanding shares. This company engages in the packaging and testing of integrated circuits and discrete devices, which is a strategic industry in China. It designs and manufactures chips used in discrete devices like switches, schottkies and pins etc. The company also offers lead frame and laminated packaging products, and packaging materials. At the end of 2013, the total assets of JCET were $1.24 billion; total liability was $0.81 billion; operating income was $0.84 billion. JCET ranked sixth place in the world packaging and testing of Integrated Circuit (IC) industry in 2013. JCET had an expansion strategy in three directions. First, it wanted to obtain scale effect, upgrading its rank in the packaging and testing industry. Second, it chose to enrich its product line through advanced technology, realizing full customer coverage in both high and low ends. Third, it planned to enter international markets especially the US and European markets, gaining access to the top 20 world-class customers.

The target company, STATS ChipPAC Pte. Ltd., was founded in 1994 and is headquartered in Singapore. As the world's top semiconductor packaging and testing company, it provides packaging services to support various package technologies; it also provides a suite of test platforms and engineering services comprising test facilities. Other products and services include post-wafer fab process, document library, warehousing, drop shipment, administration, and research and development services. It is equipped with factories in Korea, Singapore, Malaysia and Taiwan. The company's main revenue is from the United States. In 2013, the United States accounted for 69.2% of total revenue, while Asia accounted for 19.0%, and Europe accounted for 11.8%. At

the end of 2013, the total assets of STATS was $2.38 billion; total liability was $1.41 billion; operating income was $1.6 billion. It ranked fourth place in the world packaging and testing segment of IC industry in 2013.

STATS was looking for a strategic partner for multiple reasons. The most important reason is that Temasek[3] that held 84% of its shares was planning to switch from the IC industry as a whole because they believed Singapore lacks an industrial development environment and supporting conditions. Another reason was that STATS had started to lose money since 2011, with a loss of $39 million in 2013.

Figure 13. Composition of the IC industry
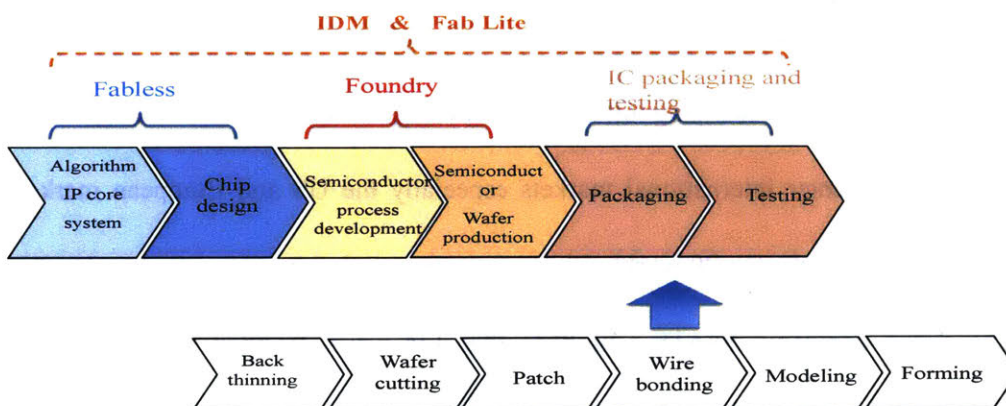
4.1.2 The transaction structure

Though JCET was planning to acquire 100% shares of STATS individually, it could not afford to pay even with debt financing. JCET promoted a $0.4 billion loan application to banks and meanwhile kept searching for strategic partners. In 2014, the National Integrated Circuit Industry Investment Fund (NICIIF) was newly founded by the Chinese government. NICIIF together with another state-owned IC company- SMIC-

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[3] A state owned PE in Singapore.

became the co-sponsors of the acquisition. It turns out that cooperation with the other partners was necessary because the final price of STATS was $0.78 billion, exceeding JCET's affordability even with $0.4 billion loans. The deal flow is shown in Figure 14.

Figure 14. The transaction structure of JCET vs. STATS
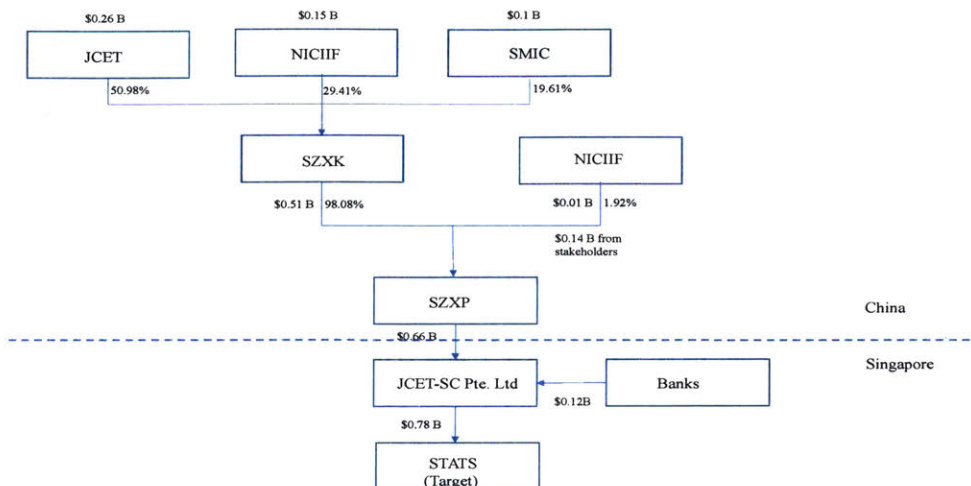
Financing sources of this acquisition were both in equity and debt forms. In the equity side, JCET, NICIIF and SMIC were sponsors, which got the reward of stakes of STATS. NICIIF and SMIC are state-owned funds acting as financial investors. SZXK, SZXP and JCET-SCP Pte.Ltd (Bid Company and borrower) are all SPVs founded for the acquisition facility. In the debt side, M&A loans are proposed by one of their SPVs-JCET-SC. Thus the operation status of JCET, the substantial buyer and borrower, is essential to both the acquisition and the banks that grant the loan. The main terms of the M&A loan are shown in Table 3.

Table 3. The main terms of the M&A loan

Item	Contents
Total Amount	$120,000,000

Loan term	5 years
Interest rate	1 year LIBOR+ 580BPS
Payment arrangement	Interest and principal will be repaid annually
Guarantee	The 100% shares' pledge of STATS; Collateral of JCET's plant in Jiangsu; JCET's holding company as the guarantor
Constraints	EBITDA, debt/equity ratio and other financial ratios should obey what agreed in the contracts; if the borrower is issuing new debt, it should be agreed by the bank beforehand.

The terms of M&A loan have bonded JCET and STATS, which is a typical way in current M&A loan transaction in China. So analysis on both companies should be carried out to manage potential risk.

In the transaction, a special situation is worth mentioning. STATS, the target company, had about $ 0.8 billion long-term debt when the acquisition happened. If the bid company had assumed the debt, JCET could not afford such a huge expense. So the two parties made an agreement about the existing debt: that STATS and its main stakeholder, STSPL, should solve the short-term debt burden before the take-over offer. Specifically, STATS would newly issue about $0.4 billion priority notes maturing after 2020; the Singapore syndicate would provide $0.315 billion loans for STATS maturing after 2020; and STATS would newly issue $0.2 billion permanent debt subscribed by STSPL. This agreement is critical for both the acquisition transaction and the banks' risk analysis.

In the following section, I analyze the transaction in detail from the standpoint of commercial banks. The purpose of this analysis is to examine the reasonability of loan

terms, and to make suggestions for banks' risk management improvement.

4.2 Financial risk

Financial risk analysis, or the fundamental analysis, is basically carried out in almost every case by risk managers. Specifically for the M&A loans, I would suggest that the banks should improve in two aspects. First, the financial risks of both borrowers and targets should be paid equal attention. Second, dynamic monitoring should be carried out, especially after the M&A process. I make the above suggestions because the success of the M&A process would affect substantially the repayment of loans, which means the financial status of both parties should be monitored during the life of M&A loans.

As shown below, multiple methods and models including indicator analysis, Z-score, and F-score are utilized to examine both parties' financial status.

4.2.1 Financial indicator analysis

As mentioned above, the operation status of JCET affects the repayment substantially. The target company's financial status, is also closely related to the loans' payback. Financial indicator analysis provides banks with fundamental information before granting loan.

As shown in Table 4, JCET's revenue growth from 2009 to 2013[4] averaged at 17.8% per annum, which is decent. However, there is a certain saw-tooth pattern in the growth rates. Growth peaked at 52.6% in 2010 then went down to 4.0% in 2011. Similar situations could be seen in the net income margin and growth rate. Such unfavorable

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[4] The loan actually got approved in 2014 and the deal closed in 2015. I took the banks perspective and utilized the data from 2009-2013 for convenience. The following data are in the same period.

situations could to some extent be made up for by the relatively stable gross margin, which was averaged at 19.2% annually.

Table 4. Earnings and profitability metrics of JCET

Earnings &profitability metrics	Historical				
	2009	2010	2011	2012	2013
Revenue growth(YoY)	(0.6%)	52.6%	4.0%	17.9%	15.0%
Gross margin	19.7%	24.5%	17.9%	14.2%	19.8%
EBITDA margin	21.1%	21.2%	14.8%	12.8%	16.5%
EBIT margin	5.0%	9.5%	2.3%	0.1%	4.7%
Net income margin	1.0%	5.7%	1.8%	0.2%	0.2%
Net income growth	-	795.5%	(67.6%)	(84.5%)	6.8%
EPS growth	(75.0%)	800.0%	(70.8%)	(87.3%)	0.0%
ROA	1.6%	4.5%	1.0%	0.1%	2.1%
ROE	1.9%	10.8%	3.5%	1.5%	1.9%

The target company STATS seemed to be struggling for profitability (Table 5). The annual revenue growth rate was negative in 2012 and 2013. The net income growth rate stayed negative after an obvious high growth in 2010. Probably this could explain why the target company was searching for a strategic partner in 2013. However, with the profitability dilemma, STATS still showed potential in a comparatively stable gross margin rate, which was averaged at 16.7% and ROA, which was averaged at 3.2%. The averaged ROA is even higher than that of JCET (1.8%).

Table 5. Earnings and profitability metrics of STATS

Earnings &profitability metrics	Historical				
	2009	2010	2011	2012	2013
Revenue growth(YoY)	(20.1%)	26.6%	1.7%	(0.3%)	(6.1%)
Gross margin	15.7%	20.3%	17.0%	16.9%	13.6%
EBITDA margin	25.4%	27.9%	24.8%	23.5%	23.6%
EBIT margin	5.2%	11.4%	7.7%	6.6%	4.7%
Net income margin	0.8%	6.4%	(0.1%)	1.0%	(3.0%)
Net income growth	-	974.1%	-102.3%	-762.5%	-386.8%
EPS growth	(54.4%)	974.3%	NM	NM	NM

ROA	1.8%	5.3%	3.7%	3.2%	2.0%
ROE	0.7%	9.1%	0.2%	2.4%	(3.9%)

As shown in Table 6, the activity ratios of JCET had been stable since 2009, indicating a relatively mature business condition of the company. The asset turnover has stayed at a level of 0.7x. A slight drop of receivables turnover occurred in 2012, going from a turnover around 8.1x to around 6.6x. It kept dropping to 5.7x in 2013. As a result, days receivable increased from around 45 days to 65 days. As for average days payable out, it has gradually decreased from 124.5 days in 2009 to 89.9 days in 2013. The contrasts of the trends in receivable and payable may show that there is a decline of JCET's bargaining power. It also could be simply due to the management's preference.

Table 6. Activity ratios of JCET

Activity ratios	Historical				
	2009	2010	2011	2012	2013
Asset Turnover	0.5x	0.8x	0.7x	0.7x	0.7x
Receivable Turnover	6.3x	8.0x	8.1x	6.6x	5.7x
Days receivable	57.7	45.6	45.2	55.3	64.5
Inventory Turnover	5.8x	7.1x	6.5x	6.8x	6.7x
Avg. Days Payable out	124.5	122.7	92.5	80.5	89.9

Activity ratios of STATS were comparatively stable (Table 7). Inventory turnover ratios were even higher than those of JCET, which means they probably had a good market share. However, without an increasing or positive net income, the high inventory turnover seems less meaningful. The other activity ratios seem to be stable. The days payable were comparatively shorter than those of JCET. This could be a sign of comparatively weak negotiation power or the difference of transaction routines in multiple markets.

Table 7. Activity ratios of STATS

Activity ratios	Historical

	2009	2010	2011	2012	2013
Total Asset Turnover	0.6x	0.7x	0.8x	0.8x	0.7x
Accounts Receivable Turnover	7.0x	7.0x	7.2x	7.1x	6.4x
Days receivable	52.3	51.9	50.4	51.6	56.7
Inventory Turnover	18.2x	20.3x	17.8x	15.7x	17.1x
Avg. Days Payable out	41.2	38.5	36.0	40.0	41.5

As for the solvency, JCET's leverage ratios were decent. Especially, total liability to asset ratios were stable at around 60% from 2009 to 2013, though with a slight rise in 2013. (Table 8)

Table 8. Leverage ratios of JCET

Long Term Solvency	Historical				
	2009	2010	2011	2012	2013
Total Debt/Equity	98.2%	42.6%	82.5%	119.4%	135.8%
Total Liabilities/Total Assets	62.5%	46.5%	57.5%	63.0%	65.2%

STATS has even more conservative leverage ratios (Table 9). Averaged total liabilities to asset ratio was 51.4% in the past five years. But an increasing trend of debt could be seen, making a red flag of its financial status.

Table 9. Leverage ratios of STATS

Long Term Solvency	Historical				
	2009	2010	2011	2012	2013
Total Debt/Equity	30.5%	82.1%	82.2%	82.5%	94.0%
Total Liabilities/Total Assets	34.3%	54.3%	54.4%	54.9%	59.2%

JCET's liquidity metrics seem to show a less favorable short-term solvency in the past few years (Table 10). Current ratios were mostly less than 1 and the quick ratios were never above 1 in the past five years. JCET probably had a problem in managing working capital. Banks should be concerned about its short-term liquidity solvency.

Table 10. Liquidity ratios of JCET

Short Term	Historical				
Liquidity	2009	2010	2011	2012	2013
Current Ratio	0.6x	1.2x	0.6x	0.6x	0.6x
Quick Ratio	0.5x	0.9x	0.4x	0.4x	0.5x
CFO to Curr. Liab.	0.1x	0.3x	0.2x	0.1x	0.2x
Interest coverage ratio	1.4x	4.1x	0.9x	0.0x	1.4x

STATS's liquidity ratios seem to be comparatively solvent (Table 11). This could be explained by the abundance of inventory and comparatively low leverage ratio. These characteristics allow the target company to be favorable for both the borrowers and lenders of M&A loans.

Table 11. Liquidity ratios of STATS

Short Term	Historical				
Liquidity	2009	2010	2011	2012	2013
Current Ratio	1.3x	1.6x	1.7x	1.6x	1.1x
Quick Ratio	1.2x	1.4x	1.4x	1.3x	0.9x
CFO to Curr. Liab.	0.4x	1.2x	1.2x	1.0x	0.8x
Interest coverage ratio	2.2x	4.2x	1.9x	1.9x	1.3x

The fundamental financial status of the acquirer and target shows some similarities (i.e. stable activity ratios) as well as differences. Specifically, based on the absolute value of current ratio, quick ratio and interest coverage ratio etc., the comparative solvency in short-term liquidity could be a complementarity for JCET.

However, the financial indicator analysis did show some flags for both companies: JCET has saw-tooth pattern revenue growth rate, and relatively low current and quick ratios, while STATS had struggled from profitability: net income growth rate stayed negative in past three years. Such situation would make trend analysis and multiple models necessary for further research. I examine Z-score and F-score models in the following sections.

4.2.2 Z-score analysis

The Altman Z-score is a measure of the likelihood that a public company will declare bankruptcy. A score of 1.8 or lower is an indication of distress and a high probability of bankruptcy, while a score greater than 3.0 is an indication of company health; a score between 1.8 and 3.0 would indicate that the company's future performance should be carefully monitored, though no definitive conclusions can be drawn from this gray area. Banks could use the Z-score before or after granting loans to monitor companies' financial status.

JCET's Z-scores showed high probability of bankruptcy in the past five years (Table 12). Z-score were all lower than 1.8 except in 2010.

Table 12. Z-score of JCET

	2009	2010	2011	2012	2013
Z-score	1.81	4.44	1.61	1.01	1.53

Considering the relatively low Z-score, breakdowns of each variable of the Z-score are worth further research (Table 13). In digging into the factors, NWC/TA, RE/TA, and EBIT/TA were comparatively low in the past five years. These factors back up the flags shown in fundamental analysis that JCET has less favorable short-term solvency and a decline of EBIT margin. Also it provides a caution on JCET's profitability and earning power, which has not been shown in the fundamental analysis.

Table 13. Breakdown of variables in JCET's Z-Score

Variable	This tells you	2009 Value	2010 Value	2011 Value	2012 Value	2013 Value
working capital / total assets (NWC / TA)	liquid assets in relation to size of company	-0.26	0.07	-0.21	-0.28	-0.23
retained earnings / total assets (RE / TA)	measures profitability that reflects company age and earning power	0.13	0.18	0.14	0.12	0.12
earnings before interest and taxes / total assets (EBIT / TA)	measures operating efficiency (apart from tax / leveraging factors); recognizes operating earnings as being important to long-term viability	0.08	0.24	0.05	0.00	0.11
market value of equity / book value of total liabilities (MVE / BVL)	addes market dimension that can show up security price fluctuation as a possible red flag	1.36	3.19	1.01	0.53	0.87
sales / total assets (sales / TA)	standard measure for asset turnover (which varies greaty from industry to industry)	0.50	0.77	0.63	0.63	0.67
Z-score	How likely is a company to fall into bankruptcy?	1.81	4.44	1.61	1.01	1.53

STATS had an average Z-Score stable around 1.6 (Table 14). Especially in the recent three years, there was a descending trend in scores, showing a relatively high possibility of bankruptcy. This is in line with the conclusion that STATS were struggling from the profitability problem these years per the fundamental analysis.

Table 14. Z-score of STATS

	2009	2010	2011	2012	2013
Z-score	1.34	2.24	1.75	1.44	1.08

4.2.3 F-score analysis

F-score analysis could provide banks well-rounded and comprehensive understanding of the companies' financial status, not only showing the possibility of bankruptcy like the Z-score. Flags of comprehensive financial risk could be found in the process.

Based on the recent five years' data, both JCET and STATS's financial health are just fine, with the F-score ranging from 4-8, averaged at 5.6 (Table15). Financial situations were both better in 2010, with only one "0" score in LT debt/total assets increasing. This situation is probably due to the industry's development cycle, or it is partly because of the increasing liquidity brought by long-term debt.

Table 15. F-score of JCET and STATS (in thousands dollars except the ratios)

	JCET					STATS				
Variables	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
ROA	1.6%	4.5%	1.0%	0.1%	2.1%	1.8%	5.3%	3.7%	3.2%	2.0%
Operating cash flow	31641.0	62916.9	76869.6	81217.4	133849.1	201032	465703	389240	375199	380496
Net income	3397.0	31503.5	10678.3	1670.1	1837.2	10053	107978	-2502	16563	-47493
Gross margin	19.7%	24.5%	17.9%	14.2%	19.8%	15.7%	20.3%	17.0%	16.9%	13.6%
Asset turnover	0.5x	0.8x	0.7x	0.7x	0.7x	0.6x	0.7x	0.8x	0.8x	0.7x
long term debt	31488.0	103893.3	71382.1	60180.5	123296.4	233,181	782,434	790,339	792,609	874,281
total asset	695908.5	715374.9	954376.2	1124665.8	1252482.1	2,285,619	2,249,916	2,163,778	2,268,276	2,377,670
LT debt/Total assets	4.52%	14.52%	7.48%	5.35%	9.84%	10.20%	34.78%	36.53%	34.94%	36.77%
Current raio	0.6x	1.2x	0.6x	0.6x	0.6x	1.3x	1.6x	1.7x	1.6x	1.1x
Shares Out.	745,184	745,184	745,184	745,184	853,134	2,202,218	2,202,218	2,202,218	2,202,218	2,202,218
Standards	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
1)ROA is positive	1	1	1	1	1	1	1	1	1	1
2.) Operating cash flow is positive	1	1	1	1	1	1	1	1	1	1
3.) Operating cash flow > net income	1	1	1	1	1	1	1	1	1	1
4.) ROA increased	0	1	0	0	1	0	1	0	0	0
5.) Gross margin increased	0	1	0	0	1	0	1	0	0	0
6.) Asset turnover increased	0	1	0	0	0	0	1	1	0	0
7.) LT debt/Total assets decreased	1	0	1	1	0	1	0	0	1	0
8.) Current ratio increased	0	1	0	0	0	0	1	1	0	0
9.) No new equity issuance	1	1	1	1	0	1	1	1	1	1
Total F-score	5	8	5	5	5	5	8	6	5	4

As for JCET, liquidity seems to be an obvious issue. Current ratio and asset turnover decreased in three successive years. Though ROA ratios were positive, they did not show a consistently increasing trend. The same situation could be found in the trend of gross margin. The ratio of long-term debt to total assets increased in 2013, which was a proof of the lack of liquidity issue. So the banks should be cautious when granting loans. The alternative repayment resources, like the assumption of debt of the target company or a third party strategic partner, could be a good consideration. Could the target company, STATS, be a complementary resource? ROA and gross margin decreased from 2011 to 2013. Current ratio and asset turnover kept decreasing in 2012 and 2013. Especially current ratio fell from 1.6x to 1.1x in 2013. Long-term debt/asset ratio also increased in 2013, leading to the lowest total F-score.

So it seems that acquiring STATS has a complementary function for short-term repayment, as the analysis of financial indicators showed. However, the enhancement

is probably not as high as expected. This could bring in two suggestions: STATS could enhance the credit ability for the borrower because it has comparatively solvent short-term liquidity; however, banks should be cautious that the trend of related ratios show potential risks of the repayment ability of both borrowers and target company. But how much is the complementary effect? How can we quantify the synergy effect? I will elaborate in the integration risk analysis.

To summarize, financial risk analysis provides the fundamental information of the financial status of the related parties. Indicator analysis, Z-score, and F-score could reflect multiple perspectives. Since the M&A is a dynamic process related to multiple parties, it is suggested that multiple and dynamic analysis models should be utilized in the whole process of loans. In this way, the effect of post-M&A could be monitored. But to quantify the synergy effect of M&A and predict the repayment, I suggest the analysis of the free cash flow, which is essential in both the valuation and combined risk analysis.

4.3 Valuation risk

Valuation is critical in granting M&A loans not only because it provides a reference for the loans' quantum but also allows banks to forecast free cash flows (FCFs). By predicting FCFs, banks could forecast the companies' financial performance during the loans' life, taking risk mitigation measures if necessary. Valuation is a comprehensive evaluation of both the companies' operation and related elements that could affect the repayment.

4.3.1 Two valuation approaches

The target company STATS's value could be predicted with the two most common

approaches: the discounted cash flow analysis (DCF) and comparable company analysis. The first approach is more preferable since it provides detailed assumptions with which banks could determine multiple assumptions. Also, the utilization of free cash flows could be an agent for the post-M&A performance evaluation.

I adopted the enterprise FCF model (Table 16) to evaluate STATS. There are two critical steps in the process: the prediction of sales growth rate and the cost of capital. As for the growth rate, I make a conservative assumption: sales decrease by 6% annually in the first two years after acquisition and increase by 3% per year in the last three years. Perpetuity growth rate was set to be 2% after five years. These assumptions are made in reference to both the historical data (2009-2013) and the actual data of revenue. Revenue decreased by 6% in 2013; the actual numbers of 2014 and 2015 (-0.8% and -15.6%) showed that the anticipation should not have been so optimistic. However, in consideration of the possible synergy effect, I make the perpetuity growth rate positive at 2%. The other factors are mostly set as a percentage of sales.

Table 16. Prediction of STAT's free cash flow (in thousands dollars except ratios)

	Historical					Projection				
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sales	1,325,685	1,677,834	1,706,500	1,701,549	1,598,522	1,502,611	1,412,454	1,454,828	1,498,472	1,543,427
Growth Over Prior Year	(20.1%)	26.6%	1.7%	(0.3%)	(6.1%)	(6.0%)	(6.0%)	3.0%	3.0%	3.0%
COGS	1,117,308	1,337,950	1,416,833	1,414,045	1,380,941	1,247,167	1,172,337	1,207,507	1,243,732	1,281,044
% of sales	84.3%	79.7%	83.0%	83.1%	86.4%					
SG&A	95516	101851	105541	122958	96140	90,157	84,747	87,290	89,908	92,606
% of sales	7.2%	6.1%	6.2%	7.2%	6.0%					
R & D Exp.	43,358	47,462	52,962	51,722	46,432	45,078	42,374	43,645	44,954	46,303
% of sales	3.3%	2.8%	3.1%	3.0%	2.9%					
EBIT	69,503	190,571	131,164	112,824	75,009	120,209	112,996	116,386	119,878	123,474
EBIAT	57,687	158,174	108,866	93,644	62,257	99,773	93,787	96,601	99,499	102,484
Plus: D&A	266,630	277,717	292,198	286,407	302,508	270,470	254,242	261,869	269,725	277,817
% of sales	20.1%	16.6%	17.1%	16.8%	18.9%					
Less: CAPEX	140,754	283,114	327,101	387,067	408,214	285,496	268,366	276,417	284,710	293,251
% of sales	10.6%	16.9%	19.2%	22.7%	25.5%					
working captial	162,421	247,406	247,154	219,294	53,987	180,313	169,494	174,579	179,817	185,211
% of sales	12.3%	14.7%	14.5%	12.9%	3.4%					
Less: Change in working capital	-30,167	84,985	-252	-27,860	-165,307	126,326	-10,819	5,085	5,237	5,395
Free cash flow to the firm	213,730	67,792	74,215	20,844	121,858	-41,579	90,481	76,967	79,276	81,655

The cost of capital (WACC, Weighted Average Cost of Capital) requires more research on both companies' current capital structure and the situation of the market. When

44

estimating the cost of equity, I believe the project-based beta is more preferable than the industry- or company-based ones. However, the market historical data such as the beta for the semiconductor industry in the global market could still be a reasonable reference and the base number when re-leveraging the beta for the target company. Table 17 shows the process of WACC estimation.

Table 17. Estimate of WACC

Region	Beta	D/E Ratio	Tax rate	Unleveraged beta
Emerging market	1.37	16.28%	10.31%	1.33
US	1.20	13.39%	7.71%	1.11
Global	1.36	15.14%	9.82%	1.28

Averaged unleveraged beta	1.24
STATS' targeted capital structure (total capital/equity)	1.67

WACC Calculation

Expected Market Return (Bloomberg)	9.13%
STATS leveraged beta	2.07
Risk-free Rate (Bloomberg)	2.41%
Cost of Equity	**16.30%**

Cost of Debt	3.75%

Cost of Debt, after tax	3.11%
% Equity Weight	60.00%
% Debt Weight	40.00%
WACC	**11.02%**

Data source: Aswath Damodaran website; Bloomberg

By summing up the discounted free cash flow and terminal value at WACC (11.02%),

the enterprise value would be $0.74 billion. This number is lower than the result of the

comparable analysis approach, $0.85 billion. (Table 18). This difference is mainly

because conservative predictions in the growth rates were utilized in the DCF model.

Meanwhile, I used the historical data of average EV/EBITA in the global market as the

agent of the comparable, which could also explain the discrepancy between the two

results.

Table 18. Enterprise value in comparable analysis approach (in thousands dollars)

EV/EBITA of semiconductor industry	10.50x
2013EBITA	81,414
EV	**855,122**

Data source: Aswath Damodaran website; Capital IQ

4.3.2 Sensitivity analysis

Sensitivity analysis is an essential part in the valuation process. Especially in the M&A

loan granting process, multiple elements could affect the valuation of an enterprise as

well as the prediction of future cash flow. The latter function allows banks to determine a safe scale of granting loans and monitor the credit risk afterwards. Among the variables that could affect the valuation result, perpetuity growth rate and WACC are the most utilized ones. Per the sensitivity analysis matrix (Table 19), STATS's value varies from $0.4 billion to $2.1 billion.

Table 19. Sensitivity analysis matrix

		Perpetuity growth rate					
		(6.0%)	(3.0%)	0.0%	2.0%	3.0%	6.0%
WACC	9.0%	539,247	635,657	796,341	979,980	1,117,710	2,081,815
	10.0%	497,523	577,962	706,665	846,094	945,685	1,543,235
	11.0%	460,194	527,769	632,138	740,286	814,587	1,215,103
	12.0%	428,467	486,126	572,615	659,103	716,762	1,005,057
	13.0%	399,610	449,031	521,262	591,305	636,832	851,463

The buyers and banks could get an approximate number in different scenarios. Different perpetuity growth rates and WACCs could be predicted per the historical data in a related industry. In this way, valuation results in the DCF model could be evaluated by combining them with the estimation of economic circumstances.

4.4 Integration risk

The financial and valuation risk analyses allow banks to understand the financial situation of related companies and the amount of loans if granting. However, more analysis should be done before granting the loan because the integration and synergy elements are critical in the M&A process. As for this case, the financial status of both

JCET and STATS is not solvent enough. The requirement of funds is higher than the application amount of the loan. So is this project still a "sweet spot" for banks?

4.4.1 Strategy risk: Industry analysis

China has dominated semiconductor consumption in the worldwide market for about 10 years, with 22.2% compound annual growth rate compared to 6.9% worldwide. However, the gap between consumption and production has increasingly widened. (Figure 14) Most ICs consumed are provided by international companies such as Intel, Samsung and Qualcomm. Improving the production ability in semiconductor industry has been an imperative task of China's government.

Figure 14. The consumption and production gap in China's IC industry
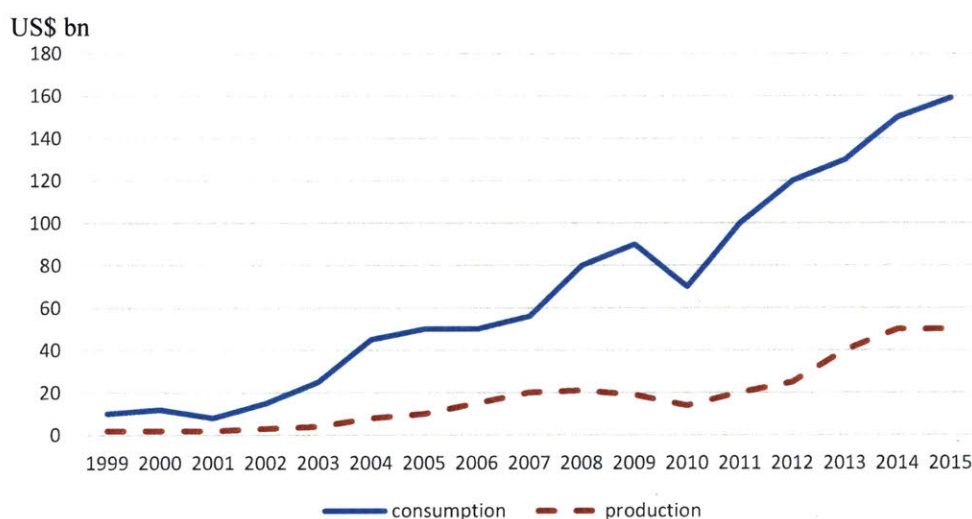
Source: PWC

Among the sub`-industries of IC that need improvement, the packaging and testing industry is the weakest part. Even JCET, the largest company in China's market, could not provide such advanced packaging and testing service as WLCSP wafer packaging, 3D packaging or TSC (Time Stamp Counter), etc. However, the development of IOT

(Internet of Things) and intelligent wearables are in great demand of such techniques. If JCET could acquire STATS, which owns multiple cutting-edge techniques in this area, it would compensate for the shortcomings. Such improvement is also of great importance to the related industries in China. In 2014, National Integrated Circuit Industry Investment Fund (NICIIF) newly founded by the Chinese government, together with another state-owned IC company, SMIC, became the co-sponsors of the acquisition of STATS.

In general, this acquisition is aligned with the industry development strategy in China. Also because of the support of NICIIF, banks could consider multiple sources for repayment.

4.4.2 Synergy analysis

Synergies in place could be derived from operation activities with predictable profit. As for the banks' special concerns about free cash flows, I believe the following aspects should be examined. First and foremost, synergy comes from the increase of revenues. Revenue rose from the mutual enforcement of the selling channels or the products of the buyer and target companies. In this case, JCET and STATS have similar product lines and diversified target markets. JCET could enhance the products by utilizing the advanced technology from STATS. STATS could expand to the Chinese market through JCET's selling channel. In this way, both companies could possibly increase revenues after acquisition. Secondly, synergy comes from the decrease of cost. Sources of cost reduction include economies of scale, greater bargaining power against suppliers, integration of logistics and technology, and so on. In consideration of the acquisition

strategy between JCET and STATS, costs could possibly be cut after acquisition because horizontal acquisition could bring scale economies, and improve the bargaining power thereafter.

Other synergies could arise from the decrease of assets, increase of tax shield from debt financing, and the increase of the brand influence. In this specific case, the first two aspects--increase of revenues and decrease of cost--are fundamental and easier to quantify. I will analyze the specific synergy effects and quantify these elements in the following scenario analysis section.

Integration risk analysis allows a well-rounded background for the M&A loan granting process. It provides banks more consideration about the transaction circumstances and the interaction between the companies. In this specific case, the consistency with industry policy, backup by NICIIF would probably be a plus for the granting decision.

4.5 Combined risk management

After analyzing the above situation, banks could probably make a decision of granting or recovering the loans. Combined risk analysis will then provide information on repayment ability per the earnings and free cash flows of related companies. Statistical and scenario approaches could be utilized as follows.

4.5.1 Statistical approach

The statistical approach is one of the empirical study methods based on the historical data gathered. In analyzing the variation trends and correlation between the earnings of the two companies, I examine the relations of the two companies before acquisition. And such trends would to some extent affect the cash flows afterwards. I use EBITA as indicator of source available for repayment. Per the historical data from 2003 to 2013,

the two companies' EBITAs were positively correlated with the correlation 0.73. Both

the companies' earnings were fluctuating, with the deviation of 17,926 (JCET) and

55,728 (STATS). Because of the positive correlation, such volatility became more

obvious after combination, with a larger deviation of 69,963. This positively correlated

relation is a red flag for the borrower: One companies' earnings could not be properly

hedged by the other, providing a buffer when one company loses money. One reason

could be that the two companies were in the same industrial cycle. The relation and

trend between the two companies' EBITA are illustrated in the following chart. (Figure

15)

Figure15. Historical EBITA of JCET, STATS and direct combination
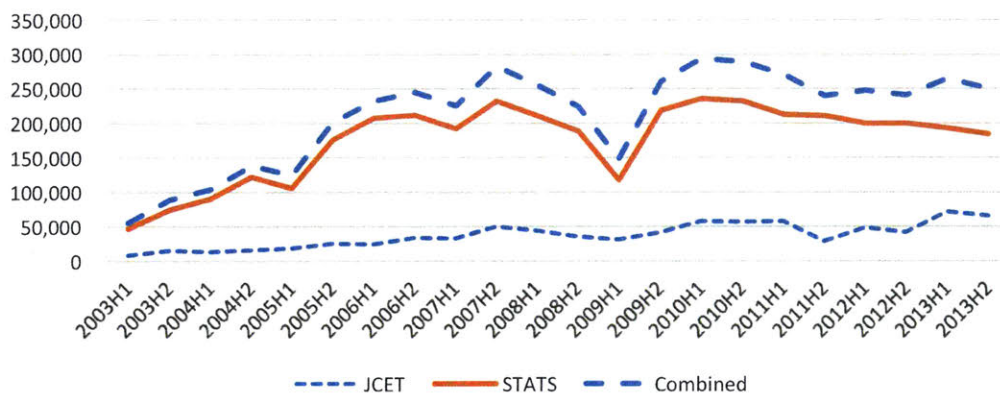
The statistical approach provided risk analysis per the historical data. But it could not

be directly used as the prediction of repayment since more conditions like the synergy

effect should be considered. In the following section, I will use scenario analysis to

predict the repayment situation with multiple assumptions.

4.5.2 Scenario approach

In this approach, I predict the total free cash flows available for repayment in different

scenarios after acquisition. Before going on with the scenario analysis, multiple

assumptions and prerequisites are highlighted below.

- Since JCET holds 50% of the target company, STATS, after acquisition, it also

  could claim 50% of STATS's free cash flow.

- All the free cash flow mentioned above could be used to repay the loans from 2014

  to 2018 since the existing debt and interest of the target company have been

  restructured or postponed.

- In different scenarios, assumptions were made per the possibilities in operation

  conditions with different synergy degrees. To simplify the effect of synergy, I

  utilized revenue growth rate, COGS, SG&A, and other expenses (including bad

  debt provision for JCET and R&D expense for STATS) as the representative

  variables. The percentage of D&A, CAPEX and working capital[5] remained

  consistent.

- Generally speaking, the synergy effect would take time to become obvious. Thus,

  the growth rate of revenue is assumed to be higher in the later years.

- Since JCET is the actual borrower, the tax shield effect is considered in its free cash

  flow prediction. Thus the interest rate payment would not be shown in the

  combined model.

Scenario one: This is the most optimistic scenario. Assumptions are made based on

their historical performance (2009-2013). The synergies after acquisition are obviously

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[5] Change in working capital is comparatively high in 2010, which directly led to a negative free cash flow even with an obvious growth in revenue. This is largely because substantial amount of non-liquidity debt were due and paid back this year.

shown in the revenue growth. JCET's revenue growth rates are 15% in the first two years and became stable at 20% afterwards. STATS's revenue growth rates are 1% in the first two years and 3% afterwards. But the cost and expenses will not be decreased as expected. This is because an obvious increase in revenue will probably enlarge the COGS. The management fee would not go down because the acquisition will probably require more management and integration work. In this situation, the balance would stay positive over the life of M&A loan. But it is noticeable that the FCF of both companies in 2014 are negative. If it were not for the retained cash from STATS, the repayment of the loan would have been at risk.

Scenario two: This is relatively a conservative scenario. Synergy could still be found in both companies but would not be as obvious as in the first scenario. JCET's revenue growth rates are 10% in the first two years and become stable at 15% afterwards. The target, STATS, also has a rise in revenue because of the acquisition. But the growth rates are lower at -5% in the first two years and stay at 1% afterwards. In this scenario, the buyer company needs to pay more for SG&A due to the increasing complexity of integration. JCET also needs to increase other expenses like the provisions for bad debts. Due to a decrease in the growth rate, the balance after repayment in 2014 would be negative. The FCF of JCET has been negative ever since 2014. Such situation warned the banks that if JCET could not control the SG&A well, and the growth rate of revenue was not high enough to cover such increase, the repayment would be at risk. The intuition is to warn the banks and buyer that the acquisition synergy for the buyer is essential. Revenue growth and the integration should be carefully managed for the

buyer.

Scenario three: In this scenario, I assume synergies fail to increase the revenue or cut costs for both companies, which is the worst situation. Revenue growth rates are lower than in the first two scenarios. JCET's revenue growth rates are 5% in the first two years and became stable at 8% afterwards. The target company even has a negative growth rate in the next few years. COGS increases for the buyer company and decreases by 1% for the target because of an obvious decrease in its revenue. The other expenses remained basically stable. In this situation, balances are negative in most of the five years except in 2015. If this situation happens, banks should be very concerned about the timely repayment of the loan. This situation also warns banks that they should have a thorough understanding of the synergy after acquisition. The industry experience data and a deep research into the industrial cycle could be a decent reference. Detailed results of the above scenarios could be found in Table 20[6].

In this case, multiple scenarios represent different synergy effects after acquisition. Banks can forecast borrowers' credit risk based on the analysis of total cash flows in a certain scenario, and take risk mitigation measures in advance. In practice, to develop cash flow analysis in different contexts, banks may need to make assumptions based on current market conditions, historical data, and even internal information etc. I hereby illustrate with simplified case to show how scenarios work.

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[6] The source of financing district is currently shown in the result in Scenario three. The results will vary per different scenarios.

Table 20．Different scenarios for repayment after acquisition

		2013	2014E	2015E	2016E	2017E	2018E
Source of financing	JCETs FCF for equity		-43,607	-21,000	-14,547	-14,333	-13,963
	STATS's FCF for repayment		-12,786	50,519	43,677	41,493	39,418
	Retained Cash from STATS(50% claim)	64,568					
	Total source of fund		8,175	29,519	29,130	27,160	25,456
Payments	Loan Principal payment		24,000	24,000	24,000	24,000	24,000
	Loan Principal remained	120,000	96,000	72,000	48,000	24,000	0
	Total use of fund		24,000	24,000	24,000	24,000	24,000
	Balance		-15,825	5,519	5,130	3,160	1,456
	1 year LIBOR	0.58%	0.63%	1.18%	1.68%	1.93%	
	Interest rate(LIBOR+580BPs)		6.38%	6.43%	6.98%	7.48%	7.73%

		2013	2014	2015	2016	2017	2018
	Scenario 1						
JCET	Revenue growth rate		15%	15%	20%	20%	20%
	COGS as % of sales		80%				
	SG&A as % of sales		14%				
	Other Expense % of sales		1%				
STATS	Revenue growth rate		1%	1%	3%	3%	3%
	COGS as % of sales		82%				
	SG&A as % of sales		6%				
	Other Expense % of sales		3%				
	Balance		5,966	35,874	51,493	59,685	69,262
	Scenario 2						
JCET	Revenue growth rate		10%	10%	15%	15%	15%
	COGS as % of sales		80%				
	SG&A as % of sales		15%				
	Other Expense % of sales		2%				
STATS	Revenue growth rate		-5%	-5%	1%	1%	1%
	COGS as % of sales		80%				
	SG&A as % of sales		6%				
	Other Expense % of sales		3%				
	Balance		-2,691	20,433	26,390	27,419	28,584
	Scenario 3						
JCET	Revenue growth rate		5%	5%	8%	8%	8%
	COGS as % of sales		81%				
	SG&A as % of sales		14%				
	Other Expense % of sales		1%				
STATS	Revenue growth rate		-10%	-10%	-5%	-5%	-5%
	COGS as % of sales		82%				
	SG&A as % of sales		6%				
	Other Expense % of sales		3%				
	Balance		-15,825	5,519	5,130	3,160	1,456

Based on the above analysis, banks could have an evaluation of the substantial risks. Financial status of both companies are not decent. The acquisition could potentially generate synergy due to the alignment of product lines but the synergy should be obvious enough even at the first two years to contradict the financial tension. A scenario analysis afterwards allows banks to quantify the synergy effect and repayment risk. If there were no extra funding sources, the banks should have thought twice before

granting. In the real situation, banks granted a syndication loan with whole collaterals and substantially lowered the amount. The involvement of state-owned funds was probably an important consideration for the banks to finally grant the loans. In general, financial analysis provides the fundamental situation of related companies. Valuation risk analysis allows banks to examine the acquisition price and predict free cash flows, which would be the essential resource for repayment. Integration risk analysis would focus on the external elements and synergy effect. Though the integration risk analysis is mainly qualitative, it shows clues of the quantitative analysis. The combined risk analysis model is a comprehensive analysis, which provides a method to predict sources of repayment. Through analysis of different scenarios, banks actually practice a stress test. I suggest banks enforce an integrated use of the aforementioned methods in the process of M&A loans. In this way, they would have a well-rounded prediction of the substantial risks and could take measures beforehand.

Conclusions

Bank loans are essential in China's M&A market but need improvements in multiple aspects. There is a severe mismatch of the demand and supply of the funds. Commercial banks tend to be conservative in granting loans. Compared with the related products in the US market, M&A loans in China have shown a limited number of participants and a lack of product diversification.

Underlying reasons include credit preference, undeveloped capital market, and the inadequacy of risk management. Thus, measures in both macro and micro levels should be taken. In the macro level, authorities should consider to break the wall of "separate operation," take substantial measures to activate and regulate institutional investors, and build a structured and layered capital market to satisfy different investors' risk appetites. In the micro level, commercial banks could take measures in both business development and risk management. More flexible terms and interest rates could be developed to cater to different client needs. Banks should improve their ability to give finance advice as well. Improvement of risk management ability is fundamental. While many previous studies have discussed the necessity and approaches of improving risk management ability, they are mostly constrained to qualitative analysis or general suggestions on different risks. In this thesis, I took a case study approach and quantified the risks with multiple models. Among the different risks, I believe financial, valuation, integration and comprehensive risks are substantial. Due to the complexity of M&A transactions, multiple models and approaches should be taken to provide well-rounded information. The free cash flow model is essential in predicting the repayment ability.

Scenario analysis could be enacted to include different synergy effects after acquisition. Being able to have a thorough analysis of these substantial risks, banks could be more flexible in both product design and customer selections. This is of great meaning when the improvement of the Chinese capital market still has a long way to go.

Although suggestions in this thesis are mainly made for commercial banks to improve the deal flow and risk management in granting M&A loans, the substantial risk analysis principles could actually be widely utilized in any M&A financing process to evaluate risk and return. But admittedly, there are still multiple issues worth further research. How could we manage comprehensive risks in an even more complicated environment, quantifying foreign exchange rate risk, legal risk and strategic risk in one model? How could we improve the risk management in a tiered capital market with the involvement of derivatives? How could we accelerate the improvement of the capital market in China? These questions are essential for analysis in the near future.

References

Asquith P, Weiss L A. Lessons in Corporate Finance: A Case Studies Approach to Financial Tools, Financial Policies, and Valuation [M]. Wiley & Sons Canada, Limited, John, 2016.

Altman E I. Predicting financial distress of companies: revisiting the Z-score and ZETA models [J]. Stern School of Business, New York University, 2000: 9-12.

Armstrong J. The syndicated loan market: Developments in the North American context[M]. Ottawa, Ontario: Bank of Canada, 2003.

Bloomberg Global M&A market review financial rankings 2016
https://data.bloomberglp.com/professional/sites/4/Bloomberg-Global-MA-Financial-Rankings-FY-2016.pdf

Bruner R F. Applied mergers and acquisitions [M]. John Wiley & Sons, 2004.

Bruner R F. Does M&A pay? A survey of evidence for the decision-maker [J]. Journal of Applied Finance, 2002, 12(1): 48-68.

Brealey R A, Myers S C, Allen F, et al. Principles of corporate finance [M]. Tata McGraw-Hill Education, 2012.

Bushman R M, Wittenberg Moerman R. Does secondary loan market trading destroy lenders' incentives?[J]. 2009.

CBRC Guidelines on Risk Management of M & A loans 2015
http://www.cbrc.gov.cn/chinese/home/docDOC_ReadView/7DABC8D29C0148B6B3
5F0B4A7DA804EC.html

China Economic Times. China Capital Market Research Report January 12th, 2016

China Council for the Promotion of International Trade, An Investigation Report on the Current Situation and Intention of Overseas Investment of Chinese Enterprises in 2010
https://wenku.baidu.com/view/4106e84d2b160b4e767fcf5f.html

China Securities Journal A01. Expect multi-level capital market breakthrough March 6th,2017

Daniels K N, Morgan I. The Impact of Arrangers and Buyout Sponsors on Loan Pricing in Leverage Buyouts: A Cross Border Study of US and European Leverage Buyouts[J]. 2009.

de Fontenay E. Do the Securities Laws Matter-The Rise of the Leveraged Loan Market[J]. J. Corp. L., 2013, 39: 725.

DeLong G L. Focusing versus diversifying bank mergers: Analysis of market reaction and long-term performance [J]. 2001.

Devos E, Kadapakkam P R, Krishnamurthy S. How do mergers create value? A comparison of taxes, market power, and efficiency improvements as explanations for synergies[J]. Review of Financial Studies, 2009, 22(3): 1179-1211.

Fang L, Ivashina V, Lerner J. Combining banking with private equity investing[J]. Review of Financial Studies, 2013: hht031.

Fazzari S M, Hubbard R G, Petersen B C, et al. Financing constraints and corporate investment[J]. Brookings papers on economic activity, 1988, 1988(1): 141-206.

Historical benchmark interest rate, GDP, unemployment rate in China
http://www.pbc.gov.cn/,http://data.stats.gov.cn/,
http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=CN

Houston J F, James C M, Ryngaert M D. Where do merger gains come from? Bank mergers from the perspective of insiders and outsiders [J]. Journal of financial economics, 2001, 60(2): 285-331.

Ilg D. Firm-Specific Triggers of LBO Defaults [J]. Browser Download This Paper, 2015.

Ivashina V, Kovner A. The private equity advantage: Leveraged buyout firms and relationship banking[J]. Review of Financial Studies, 2011: hhr024.

The Office of the Comptroller of the Currency (OCC), Department of the Treasury; Board of Governors of the Federal Reserve System (Board); and the Federal Deposit Insurance Corporation (FDIC). Interagency guidance of leverage lending
https://www.fdic.gov/regulations/laws/federal/2013/2013-03-22_final-guidance.pdf

Kang D. The Impact of Nonbank Lending on Mergers and Acquisitions [J]. 2011.

Kejin Wang Research on the Development of M & A and Reorganization of China's Banking Industry and the Policy of M & A Loan, 2010

Leveraged Lending Comptroller's Handbook 2008
https://www.occ.treas.gov/publications/publications-by-type/comptrollers-handbook/pub-ch-leveraged-lending.pdf

Lim J, Minton B A, Weisbach M S. Syndicated loan spreads and the composition of the

syndicate [J]. Journal of Financial Economics, 2014, 111(1): 45-69.

Liu C. Debt Structure, Private Equity Reputation, and Performance in Leveraged Buyouts [J]. 2014.

Mergermarket Global and regional M&A: Q1-Q4 2016,
http://www.mergermarket.com/info/

Modigliani, F.; Miller, M. (1963). "Corporate income taxes and the cost of capital: a correction". American Economic Review. **53** (3): 433–443. *JSTOR 1809167*

Mocciaro Li Destri A, Picone P M, Minà A. From'Strategic Fit'to Synergy Evaluation in M&A Deals[J]. 2012.

Opler T C. Operating performance in leveraged buyouts: Evidence from 1985-1989[J]. Financial Management, 1992: 27-34.

Pearl J, Rosenbaum J. Investment banking: valuation, leveraged buyouts, and mergers and acquisitions [M]. John Wiley & Sons, 2013.

Piotroski J D. Value investing: The use of historical financial statement information to separate winners from losers[J]. Journal of Accounting Research, 2000: 1-41.

PWC Review of China 's M & A Market in 2016 and Outlook for 2017
http://www.pwccn.com/zh/services/deals-m-and-a/publications/ma-press-briefing-jan2017.html

PWC Continuing to grow, China's impact on the semiconductor industry 2013
https://www.pwc.com/gx/en/technology/chinas-impact-on-semiconductor-industry/assets/china-semicon-2013.pdf

Qiankun Jiang. Research on Financing Innovation and Risk Control of Transnational M & A of Chinese Private Enterprises 2015

Reem Heakal What was the Glass- Steagall Act? 2015

Shenkman M R, Barnhill T M, Maxwell W F. High Yield Bonds: Market Structure, Portfolio Management, and Credit Risk Modeling [M]. McGraw Hill Professional, 1999.

Shivdasani A, Wang Y. Did structured credit fuel the LBO boom?[J]. The Journal of Finance, 2011, 66(4): 1291-1328.

Whalen R C. Participation in Leveraged Loans: It's Not Just About Credit Risk[J].

Browser Download This Paper, 2014.

Whited T M, Wu G. Financial constraints risk [J]. Review of Financial Studies, 2006, 19(2): 531-559.

William F. Maxwell and Mark R. Shenkman. Leveraged financial markets: a comprehensive guide to high-yield bonds, loans, and other instruments, 2010

Xiaoling Wu Speech on 2010 Global PE Beijing Forum
http://funds.hexun.com/2010-11-14/125609430.html

Yago G, McCarthy D. The US leveraged loan market: a Primer [M]. Milken Institute, 2004.

Yuan Lu. Commercial bank annexation loan risk management 2014