

2018 Citi Financial Innovation Application Competition

Li jin business plan



Title : Li Jin--A REITs platform for securitization
of housing lease assets

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1. Part One: Project Introduction

1.1 Project Background

1.1.1 Domestic policy

In 2017, China held the Fifth National Conference on Financial Work and the Nineteenth National Congress of the Communist Party of China. In 2017, China convened fifth national financial work conferences and nineteenth National Congress of the Communist Party of China. It made clear the important tasks of serving the real economy, preventing and controlling financial risks, promoting the basic requirements of high quality development, as well as the general keynote of the steady progress. China released 《Notice on speeding up the development of housing rental market in large and medium cities with a net population inflow》 《Pilot scheme for the construction of rental housing using collective construction land》 and other heavy documents. At the local government level, in response to a series of spirits, such as "the house is used to live in, not to be used for speculation", the local government introduced policies to promote the housing rental market. REITs is often seen in it and has been strongly encouraged. For example, in July 1st, Shanghai officially launched the housing rental public service platform and issued the 《Shanghai housing development “13th Five-Year” plan》, studying REITs to participate in the security housing project in the way of equity, and steadily push forward the REITs pilot. Under this policy background, the REITs model will have broad prospects for development in the Chinese market.

1.1.2 Prospects For Development

Under the favorable policy background, REITs Sanitization has begun to take shape. In the domestic market, traditional developers and long rental apartment companies have tested the long rental apartment REITs mode. New rental apartment modes such as new apartments, Poly rental apartments and other new rental apartment modes have aroused great response in the market, and promoted the development of China's REITs model. Internationally, the REITs mode in developed countries such as Europe, America and

Japan has been very perfect. Compared with Europe and America, although China's domestic REITs yield is far behind, but China, as the second largest economy in the world, on the basis of the continued introduction of good policies, REITs model has unlimited development potential, the future REITs field will be a blue sea.

1.1.3 Supply And Demand Relationship In Investment And Financing Market

In order to maintain the development of enterprises, housing leasing enterprises have a very high demand for financing. However, through bank financing, most enterprises are difficult to maintain for a long time because of high threshold and high cost; through P2P means of financing, there are many drawbacks such as imperfect risk control system, frequent violations and so on. Many P2P platforms went bankrupt in 2018. In addition, the stock market fluctuated sharply since the spring of 2018. The shortage of funds in the financing market has been aggravated. In terms of investors, financial products with relatively low risk and a certain yield are preferred, but due to the lack of appropriate investment channels in this category of financial products, there are still more idle funds in society. Against this background, the Jin Jin platform came into being.

1.2 Project Introduction

1.2.1 Project Introduction

This platform is a comprehensive service platform dedicated to broadening the financing channels of domestic housing rental enterprises, enriching and improving the real estate value chain, and providing individual investors with a new way to invest in the real estate market. The platform connects the enterprise at one end and the investor at the other end. It provides both high quality and low cost financing for the enterprise and low-risk and high-yield investment projects for the investors by means of private equity fund and special plan.

1.2.2 Platform Running Process

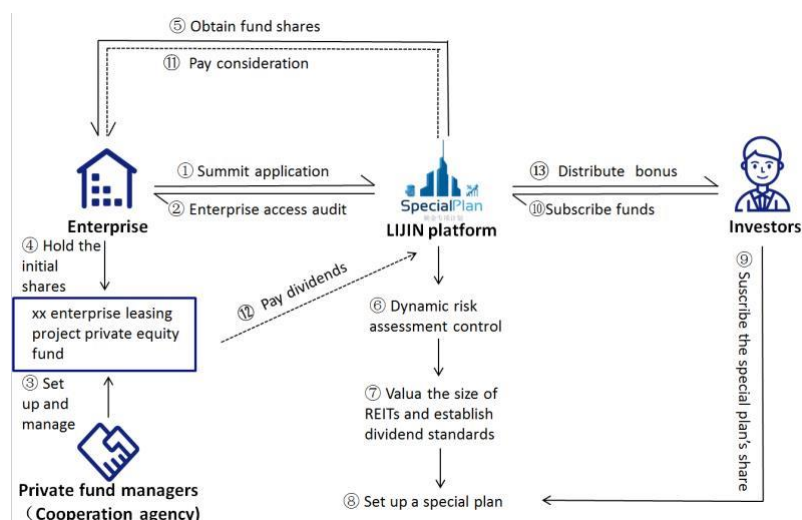


Figure1-1 platform operation flow chart

1. Enterprises submit applications:

Eligible real estate enterprises submit REITs special plan applications and provide the required underlying assets.

2. Platform dual audit:

The SPV background will review the application - submitted enterprise. Machine learning access method is adopted online, and audit institutions are manually audited under the line. The platform will provide an Asset-Backed Special Plan for enterprises which pass the audit.

3. Setting up Private Equity Fund

For companies that meet the regulations, the platform works with private equity partners to set up private equity funds invested in the enterprise and organizes this enterprise to subscribe to private funds. The platform gets the share of the fund from the enterprise and gains income right.

4. Dynamic risk assessment

For the enterprises that meet the regulations, the platform carries out dynamic risk monitoring, and uses the needle for the REITs real estate enterprise's risk control means to accurately and objectively grasp the investment risk.

5. REITs Scale valuation

For the enterprises that meet the regulations, the platform, in accordance with the international REITs valuation method, combined with the opinions of the professional asset rating agencies, establishes the REITs distribution scale, the standard of dividend, the number of years and the corresponding incremental measures.

6. Setting up a special plan

A special plan is established on the basis of the earnings rights of the acquired enterprises and asset-backed securities of the corresponding size are issued, allowing investors to subscribe for investment.

7. Special plan implementation

When the issued asset backed securities are subscribed, the special plan is carried out according to the corresponding provisions.

1.3 Expected Function

The REITs platform has two ports (investor side, enterprise side) and a backstage (SPV design supervision end). The platform provides different platform subsystems for different types of users to meet their functional requirements.

1.3.1 The Expected Function of Investor Side

The platform meets the financial needs of investors and fills the gap in the field of domestic investment REITs fund. On the investor client side of the platform, investors can choose REITs funds suitable for investment according to their own risk preferences and information disclosed by the platform.

1. View enterprise information in real time

Investors can quickly obtain financial information, risk status, regional housing price trends and rental user evaluation of all enterprises on the platform. At the same time, the platform will be established REITs fund enterprises related information transparency, fair and open, to protect the economic interests of investors.

2. RITEs fund purchase

After improving the personal information on the platform, investors can obtain the

corresponding information of REITs fund products and related enterprises, so that investors can make investment in REITs fund and apply for purchase.

3. Reflect the details of the capital market in real time

The platform uses a three-dimensional and perfect wind control system to calculate the financial risk index, default risk index and environmental analysis index of the enterprise. Investors can check the three risk measurement indexes of each enterprise in time on the platform, understand the operation of the enterprise in an all-round way, predict the profits and losses of the investment funds, and adjust their investment decisions in time.

1.3.2 The Expected Function of Enterprise End

Li Jin platform enterprise client designs REITs plan for eligible Hotel, long rental apartment, plaza and other real estate enterprises to meet the financing needs of enterprises and develop our REITs market.

1. Real time submission of financing applications

When the enterprise has the financing demand, it can submit its own financing application at the enterprise end of the Li Jin platform at any time. The background will be processed in time and the results are informed to the financing enterprise in the way of information.

2. Understand the status of REITs fund in real time

When the enterprise is informed of the access platform, the platform will determine the size of REITs fund issuance according to the future cash flow forecast and value evaluation of the enterprise, and feedback the information to the corresponding enterprise in real time.

3. Look at quantitative indicators of their own business risks

The platform combines large data analysis technology and a variety of statistical methods to analyze the external environment, internal environment, financial statements and stock price fluctuations of listed companies, and fits out the financial risk index, default risk index and environmental analysis index. Enterprises can check

the quantitative index of their operational risk from the platform at any time, timely understand their own risks from various aspects, and adjust their operational activities.

4. Optimized upgrade and repayment reminder system

On the platform enterprise client, the enterprise can check its own risk index, fund expected dividend, repayment remaining period and amount of information in real time, and receive late warning when the dividend is not on time. The client will send a series of possible credit enhancement trigger measures to the enterprise according to the real-time risk index and credit enhancement trigger conditions. Enterprises can adjust their production and operation strategies, capital turnover arrangements, etc. to prevent default caused by insufficient liquidity of capital on the dividend day, resulting in a decline in their credit rating.

1.3.3 The Expected Functions of The SPV Design Regulation End

Li Jin platform SPV design and supervision side effectively realizes the whole REITs fund construction process, while ensuring that SPV as an intermediary to understand and grasp the overall information of financing parties and investors, real-time monitoring of enterprise risk, fair and open disclosure of information.

1. Credit status analysis

According to the related financial statements submitted by the enterprise, the platform designs machine learning access mode and evaluates the enterprise's debt paying ability, operating ability, profitability, growth ability and so on, screening out the enterprises that meet the standard, and ensuring the stability of the REITs fund.

2. Enterprise cash flow monitoring

On the SPV side, the financial model is embedded in the background operation to estimate the value of the REITs funds of the corresponding enterprises. On the basis of this, the paper conducts market research on investors and determines the size of the REITs funds issuance on the basis of the combination of asset rating agencies and corporate financing willingness.

3. Risk monitoring and credit enhancement notice

Backstage SPV through the enterprise operation monitoring and real-time environmental monitoring, the establishment of a three-dimensional sound wind control system, while designing a set of credit trigger mechanism and a series of credit enhancement measures to protect the interests of REITs fund investors. For example, the introduction of priority liquidity support, margin mechanism, priority special plan share termination and exit arrangements, balance payment commitments, etc. The platform will carry out credit enhancement notification and account monitoring according to the corresponding circumstances.

4. Integration and analysis of historical data

Through sorting out the historical data of the REITs fund or the completed REITs fund project, we can get the relevant data of the supply and demand of the capital between the enterprise and the investor, understand the operation status of the REITs fund in real time, summarize the problems in each stage and make improvements.

5. Check and publish information bulletin at any time.

SPV side has information management function, not only can timely check the previous announcement, but also can be edited to send the announcement to the designated customer groups, including fund opening, dividend repayment and other announcements.

6. Optimize customer management function, and you can check customer information at any time.

Li Jin platform backstage management system can look at the basic information of investors and financing enterprises at any time, and lock the user information to prevent managers from carelessly operating on the database of customer groups.

1.4 The Main Innovation Point of Project

1. Innovation of risk control system

(1) Real time dynamic enterprise environment monitoring based on crawler technology

Based on the technology of "crawler", the platform realizes the real-time capture of the index data of people flow, traffic, housing price, consumer evaluation, supporting facilities around the enterprise, and unifies the units by the weighted and normalized method of analytic hierarchy process (AHP), which is fitted into an environmental analysis index to provide investors and the platform itself with intuitive and accurate information and risk prediction data.

(2) Revised Z value model for early warning of enterprise financial risk

The group chose Z-score financial early warning model to quantify the financial risks of real estate enterprises in China. In order to adapt to the financial changes of China's real estate enterprises, we revised the Z-score model. After testing, the revised model has a good accuracy and foresight in forecasting the financial risks of enterprises, and can control the risks of enterprises in the traditional sense through financial indicators.

(3) Revised KMV model to calculate enterprise default risk

According to the actual default situation of Chinese enterprises and to meet the requirements of accurately measuring the default risk of enterprises, this group chose to use KMV model to monitor the default risk and revised the model. After testing, the revised model is suitable for estimating the default risk of real estate enterprises in China, so it becomes a part of the wind control system to monitor the default risk of enterprises applying for financing.

Through the revised Z-value model, KMV model and large data analysis technology, we establish a three-dimensional perfect risk control system, and calculate the financial risk index, default risk index and environmental analysis index. Based on the combination of cross-sectional data reflecting the financial status of enterprises and time series data reflecting the operating status of enterprises, a wind control system for innovatively and comprehensively monitoring enterprise risks by using panel data is constructed.

2. Platform transfer function based on Citi API

The platform is based on the API provided by Citibank to obtain investor information, and the Citi API is applied to the transfer of funds when the investor purchases the special plan share and the transfer from the special plan to the investor when the special plan pays dividends. The API is used to realize the transfer function between the investor and the platform, which reduces the capital flow steps and improves the capital flow efficiency.

3. Realizing the innovation of REITs fund mode in China

Based on the Notice on Promoting the Work of Securitization of Housing Lease Assets, the platform vigorously develops the REITs Fund Platform of China's Housing Lease Assets Securitization, draws lessons from the successful experience of American REITs and sums up the failure lessons of foreign REITs, designs and develops REITs Fund in line with China's economic environment, and fills the blank in the domestic REITs fund field.

4. Design machine learning and optimize enterprise admittance

A new compound neural network is formed by the organic combination of SOM neural network model and LVQ neural network model to classify enterprises and determine the entry criteria of enterprises. The model avoids errors in training and classification because neural networks are sensitive to initial values to a great extent, reduces training time greatly, and improves the operational efficiency and prediction ability of the composite model significantly.

2. Part Two: technical part

2.1 introduction to machine learning

In order to ensure the stability of the assets in the sheet metal asset pool, it is necessary to use the machine learning method to conduct strict credit rating on the enterprise in the enterprise access stage. The platform adopts a combination of online machine audit and offline manual verification for asset audit.

2.1.1 introduction to machine learning

Machine Learning (ML) is a multi-disciplinary subject involving many disciplines such as probability theory, statistics, approximation theory, convex analysis, and algorithm complexity theory. Specializing in how computers simulate or implement human learning behaviors to acquire new knowledge or skills and reorganize existing knowledge structures to continuously improve their performance.

2.1.2 introduction to machine learning

Training data with supervised learning consists of a set of training examples. In supervised learning, each example consists of a pair of input objects (usually a vector) and a desired output value (also known as a supervisory signal). Supervised learning uses algorithms to analyze training data and produces an inferred function that can be used to map new examples. An optimal solution would allow the algorithm to correctly determine the class label if the tag is not visible.

Unsupervised learning means that there is not enough prior knowledge, so when it is difficult to manually label categories or the cost of manual category labeling is too high, we hope that the computer can do the work for us, or at least provide some help; according to the category unknown (not marked A training method that solves various problems in pattern recognition.

2.1.3 combination of machine learning and platform business

The main characteristics of data objects processed by machine learning are: ①The study between massive data can be seen as a classification problem of a series of independent variables. ② Data usually have a non-linear relationship. ③Data is usually highly correlated.

The enterprise credit rating access model of the sheet metal platform needs to deal with the 13 financial characteristics of more than 50 real estate enterprises. The amount of data is huge and the internal characteristics of the unknown enterprise data are highly correlated. Therefore, machine learning is used to establish rating access. model.

The input data in the enterprise credit rating access model of the sheet metal platform is

13 financial indicators, which fully conforms to the data standards of supervised learning and unsupervised learning, and adopts a combination of supervised learning and unsupervised learning. The judgment of the enterprise credit rating can achieve a higher accuracy rate.

2.1.4 composite neural network and enterprise credit rating

The enterprise credit rating model of the sheet metal platform is realized by combining the supervised learning neural network and the unsupervised learning neural network of the real estate enterprise to realize its analysis and prediction functions. Among them, the core of classification is to find the mapping relationship between data features and data labels; use the classification results as a reference for corporate credit, and use its forecasting function to predict enterprises with unknown credit ratings, that is, find a series of real estate enterprises. The mapping between 13 financial indicators and whether they are financially distressed enterprises.

The lijn platform adopts the SOM-LVQ composite neural network model to determine the credit rating of the enterprise applying for financing:

① SOM neural network:

Firstly, the training vector is input into SOM network for iterative calculation, and the stable network is obtained by setting the step size. The process is as follows:

- 1) each node randomly initializes its own parameters. Each node has the same number of parameters as the Input dimension.
- 2) for each input data, find the node that best matches it.
- 3) after the activation node $I(x)$ is found, update and its adjacent nodes.
- 4) update the parameters of the node. Iterate until it converges.
- 5) record the maximum and minimum distances of the last iteration.

②LVQ neural network:

Then, the training sample classification results obtained are used as the input stream of

LVQ network, and the network parameters obtained by SOM network training are used as the initial weight of LVQ network. The process is as follows:

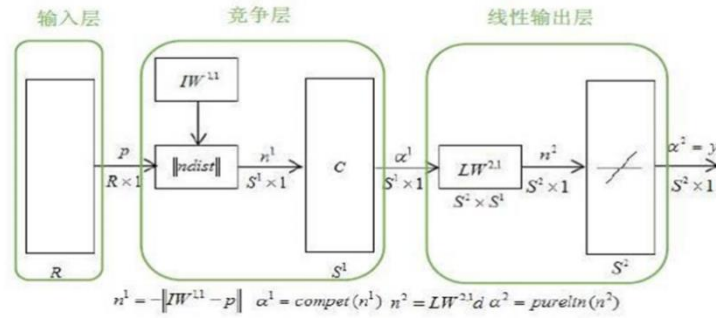


Figure 2-1

P is the input mode of R dimension;

S^1 is the neuron number of competitive layer;

$IW^{1,1}$ is the connection weight matrix of competitive layer;

n^1 is input of competitive layer neurons;

α^1 is output of the competitive layer neurons;

$LM^{2,1}$ is connection weights matrix between the competition layer and the linear output layer;

n^2 input for the linear output layer neurons;

α^2 to the output of the linear output layer neurons.

③Data preprocessing:

Input the collected enterprise data sample data into SPSS software, carry out factor analysis on the indexes including debt paying ability, operation ability, profitability and growth ability, and select representative indexes to enter into the SOM-LVQ neural network model through screening.

④Normalization of data:

As each indicator variable is different in measurement form and measurement unit, in order to make the different indicators have the possibility of sharing, the data is firstly

normalized to the interval [0,1] for normalization.

⑤model training:

The processed data is input into the SOM model, and the neural network is trained by using train function and sim function. When the results were stable, the output results were taken as the input vector of LVQ neural network, and the neural network was simulated and trained by using function train and sim to obtain the final classification results.

⑥Analysis verification:

On the basis of the classification results, the results are divided into credit ratings; the sample data of known grade enterprises are collected as verification sets to verify the validity of the classification results.

⑦Evaluation of main model:

The classification results are evaluated through the validation of the verification set, and the problems are found and the network model is improved.

The whole process is shown in the figure below:

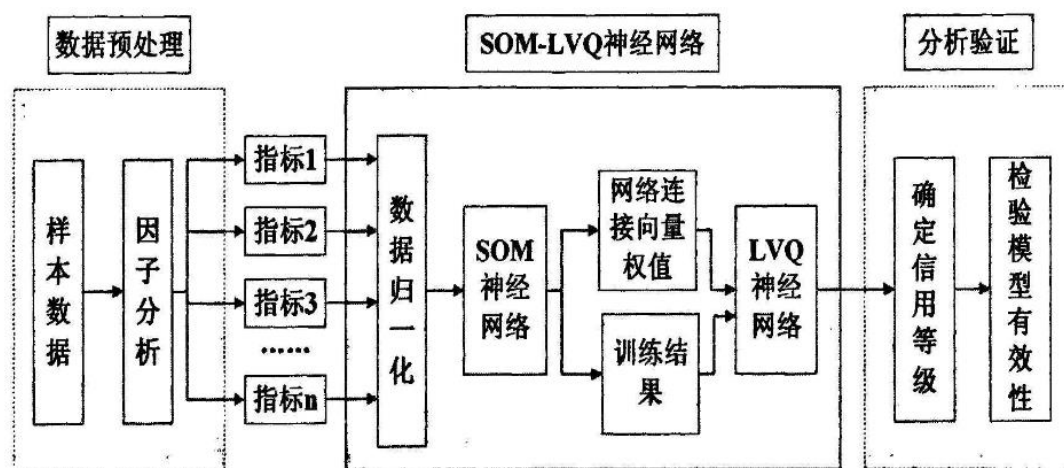


Figure 2-2

2.2 technical introduction of website construction

2.2.1 project development technology

The design of the golden platform B/S(Browser/Server) architecture enables users to enjoy complete functions and fast services through the Browser without having to install extra software. HTML5+CSS3, Skel. Js front-end framework, JavaScript, JSP and Ajax technologies are adopted for web page display. Through reasonable use of color, font, picture, and style, and considering interaction, design beautification products with unified tone and consistent page style, users will have a simple, clear and interactive user experience. Meanwhile, Spring MVC framework, a lightweight Web framework based on Spring 4.x, is adopted in the emerging lightweight J2EE platform, and open source database My SQL is selected for database development.

2.2.2 introduction of the front-end page of the project

1. Material package based on skel.js framework

By designing the page layout and comparing the page styles of other well-designed business websites, we adopted the material package of lightweight front-end development framework skel.js. The design of the web page reflected the lijin platform atmosphere, simple, commercial style. The UI bundle increases the reuse of CSS stylesheets, which greatly improves the efficiency of page design. Figure 12 shows part of the platform's web page.



Figure 2-3

2. Implementation of dynamic page effect

When realizing the dynamic effect of web pages (such as the search of REITs fund, the pop-up of prompt box and the effect of side suspension window), we adopted

JavaScript technology and directly invoked the existing open source JQuery package on the network, which made the web pages more exquisite and improved the page design efficiency. Figure 13 is a call to the JQuery package to implement a search for REITs funds.

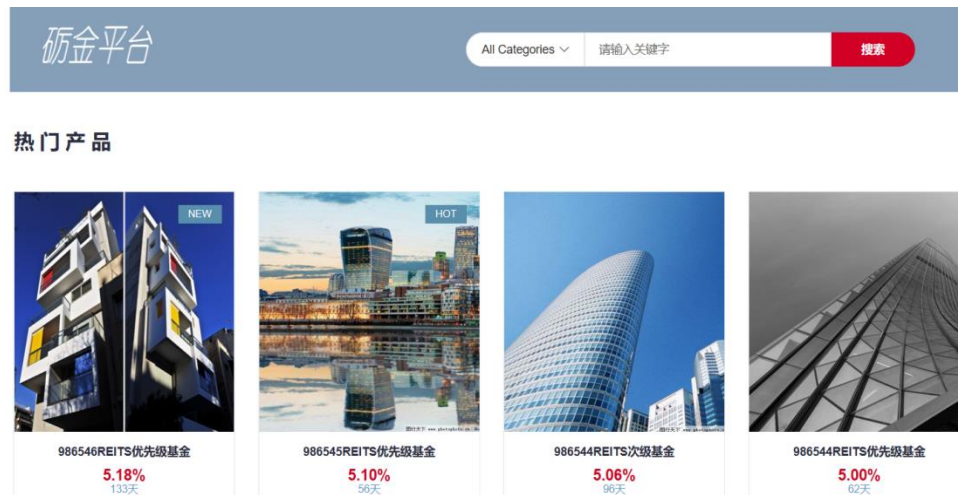


Figure 2-4

3. Part Three: Project application prospects

3.1 Market Analysis of the Project

3.1.1 Macro Environmental Analysis

The market for the “lijin” project is mainly concentrated in the commercial real estate leasing industry. At the same time, long-term rental apartments, as the main support development projects in the past two years, are a major feature in this project. Commercial real estate leasing mainly refers to the leasing of square shops, hotel rentals, and long-term rental of apartments. Among them, the square shop leasing and hotel rentals have a long history, although the financing demand is equal to the development of real estate and the sale of commercial real estate business, the high-quality financing supply is far less than the latter, so it still has a good market prospect to provide financing supply for commercial real estate leasing industry. And rent the apartment as an emerging industry got the support of the country, there are two backgrounds in the first and second tier cities: the phenomenon that the housing

demand is difficult to meet due to the high price of housing, and the concept of renting rather than buying houses gradually becomes popular among young people, the rent the apartment model in 90 after 00 and even part of the working class after 1985s has huge market potential.

3.1.1.1 Humanistic factors

1. Long-term rental apartment commercial real estate

(1) The golden age of the housing leasing industry

The era of rapid growth of real estate industry brought by China's rapid urbanization has come to an end. The real estate industry will change from a rapidly expanding "incremental market" to a market with both stock and increment.

(2) The age of the lower age and the age of housing

First of all, the “85 before” rigid demand group entered the stage of house-changing; secondly, the “post-85”-born population was just in need, although this part of the demand should have been released around 2014, but due to the 2012-2013 regulatory policy suppression, the residential market is expected Not high, the favorable policies such as credit easing in 2015 made this part of the demand concentrated, and the superposition of the two demands created a transaction boom in the real estate market in large and medium-sized cities in China since 2015. In short, in the transaction around the year of 2009, the rigid demand for the first place is the absolute main force, and the “new house demand” dominated by the “changing house” in the transaction since 2015 was more than half.

With the rising housing prices, the demand for young people to buy houses has also been decreasing. Instead, what replaces is the demand that rent a house increases ceaselessly, rent a life to have become a kind of new trend gradually.

(3) Industrial structure optimization promotes housing demand growth in big cities

The urbanization in the past was industrial-driven, and the current urbanization is

dominated by the service industry. In the process of industrialization, all localities can sell industrial land at low prices to attract investment, thereby promoting regional economic development and urbanization. However, in the service-led urbanization process, only the core metropolis can provide sufficient employment opportunities, so the labor force must flock to the core metropolis inevitably.

But with the influx of workers, the housing prices in big cities have also risen. With the continuous influx of the working population, the problem of buying a house is becoming more and more serious. Many people have to turn their attention to the rental industry.

(4) Industrial relocation drives migration, and different cities have different prospects

At present, China's urbanization has entered a new stage, and the policy focus will be on the cities within the urban agglomerations and cities with industrial advantages, with industry as the driving force, increasing the adhesion of strong populations, which will also stimulate the real estate market of such cities. vitality. The rise of the real estate industry will inevitably lead to the rise of the rental industry, while buying and renting houses will also increase production.

2. Other commercial real estate

In recent years, with the development of urbanization, the population continues to flood into the city, the development of the primary industry and the secondary industry has slowed down, the tertiary industry has been rising, and individual entrepreneurship has been supported by the state. More and more people have become their own bosses. In addition, chain catering, apparel and other enterprises pay more and more attention to the platform effect of the square, and the market of the square store rental business also has excellent development prospects.

3. Fund market development

With the improvement of the education level, the overall quality of the people in China has been continuously improved, and the basic knowledge of the financial field has

become more and more familiar, people's awareness of financial management has been strengthened gradually, creating external conditions for the development of the fund industry. Meanwhile, the continuous improvement of financial market and the continuous enrichment of financial instruments also provide a good soil for the localization of REITs model in China.

3.1.1.2 Policy factors

1. On August 22, 2017, Beijing and Nanjing respectively issued the “Notice on Accelerating the Development and Standardization of the City's Housing Leasing Market (Draft for Comment)” and the “Nanjing Housing Leasing Pilot Work Plan”. In addition to the above two places, Guangzhou, Foshan, Wuhan, Shenyang, Zhengzhou, Chengdu and other places have successively issued relevant programs. The first 12 cities in China to carry out housing leasing pilots have gradually entered the era of “Renting and buying have the same rights”, and accelerated the development of the housing leasing market. . The curtain of the era of housing leasing in China has been opened, and the housing market, the people's home ownership concept and lifestyle will undergo major changes.

For example, Beijing will continue to increase the supply of rental housing in the next five years. It plans to supply 1,300 hectares of land and build 500,000 sets of rental housing, mainly through collective construction land. Shanghai has proposed an increase of 700,000 sets of rental housing during the 13th Five-Year Plan period, partly from new additions and partly from stocks.

It can be seen that the long-term rental apartment has a good development prospect and is strongly supported by the state. Enterprises that develop long-term rental apartments have an advantage in policy, and the number of such enterprises will also increase.

2. Nowadays, China's political situation is basically stable, and most parts of the world are also stable. Peace and development are the theme of The Times. The fund market is a part of the financial market, and the development of the financial market is largely influenced by the political situation. Therefore, China's fund market will have further

development in the future.

In addition, there are many gaps in the laws and regulations concerning REITs in China, and there are deviations in the development direction of domestic REITs, and some businesses are in grey areas. However, with the continuous development of the fund industry, the investment objects are more and more diversified. Meanwhile, with the development of the economy, the financing needs of enterprises are also expanding. The development of real estate investment funds will be a trend. In addition, with the introduction of new regulations on capital management, the supervision of financial institutions has become stricter, and the financial market has been continuously improved, which also provides a good market environment for the development of REITs.

3.1.1.3 Economic factors

The rapid development of China's economy over the years has not only created a more reasonable and fair market for many enterprises, but also provides a solid foundation for the development of the financial market, while the rapid development of the financial market injects vitality into the enterprise. As the leading role of China's economic development, the real estate industry is also the biggest beneficiary of China's economic development. The fund relying on the real estate industry is standing on the shoulders of giants. Under the influence of China's economic development in recent years, the development momentum is strong.

3.1.2 Micro-environmental analysis

3.1.2.1 Financing enterprise

Nowadays, commercial real estate enterprises have serious problems of high financing cost and lack of quality financing. Banks have harsh lending conditions and strict auditing of financing for large enterprises. In order to solve the financing problems of enterprises, li jin platform emerges as The Times require. In terms of financing enterprises, this platform to redeem all the subprime funds, in order to protect the

interests of investors and for some good credit enterprise, operating in good condition, this way are much lower, retained more profit for the enterprise, also provide more opportunities for enterprises to expand reproduction than by way of borrowing, lending and other financing costs

3.1.2.2 Investors

1. This platform adopts the dual monitoring method of dynamic monitoring and static control, which allows investors to see the operating status of the enterprises that his investment project belongs to at any time, and make it easy to make correct choices when buying and selling in the secondary market. At the same time, investors can obtain sufficient and accurate information from the platform to make rational and voluntary decisions.

2. There are many investors in the market today, but the risk is lower and the project that has certain profit is very few and there is a dilemma of “having money and no investment”, and most investors are now willing to pursue low-risk, high-yield wealth management products. In order to adapt to this demand, the platform adopts innovative market access method and risk assessment method to conduct strict risk control and timely information disclosure for investors to analyze.

3.1.2.3 "Li Jin" platform

1. **Reptile technology:** Collecting data on other websites and summarizing information on this website can monitor the operation status of other companies in the same industry in real time. And compare financing enterprises and other enterprises in the same industry.

2. **Machine learning technology:** a new composite neural network is formed by the organic combination of SOM neural network model and LVQ neural network model, and the enterprise is graded to determine the entry standards.

3. **Innovative market access rules and risk assessment methods system :** The market access model of machine learning and the new risk control system combining

z-score model, KMV model and big data analysis technology are adopted, and a dynamic and static risk assessment method to quantify macro indicators to make the indicators more accurate.

4. **API application:** reduce capital flow steps and improve capital transfer efficiency.

5. **Financing platform design:** The platform design is beautiful and generous, and investors and financiers are easy to operate.

6. **Stable source of funds:** The financing enterprises are mainly commercial real estate leasing enterprises. The source of cash flow is stable. The private equity & special plan is adopted to facilitate investors to understand the situation of their investment funds. The platform adopts multiple risk isolation, high credit rating, it is suitable for individual investors to make investment

3.1.3 Porter Five Forces Model

3.1.3.1 Enterprise bargaining ability

1. Real estate enterprises generally have the characteristics of high investment cost and slow effect. Therefore, enterprises need a large amount of capital to expand their scale and increase investment. However, conventional financing channels cannot guarantee enterprises to raise enough funds, and at the same time the distribution of profits will also reduce the profits that the company itself receives. Due to the limitations of their own scale, the high threshold of traditional financing, the problem of financing is more serious, and the bargaining power of the supplier is weaker.

2. Through platform financing, the enterprise itself subscribes to the secondary part of the fund, and more profit remains in the hands of the company when it obtains more income in the future, avoiding the multi-profit distribution of common financing methods (issuing ordinary funds, stocks). At the same time, by prioritizing the distribution of the income of priority investors, the company should urge enterprises to use funds reasonably, and improve the enthusiasm of enterprises to reduce the risk of using funds. It greatly reduces the financing cost of enterprises. At present, the REITs

model financing platform is temporarily blank in the market, so enterprises are willing to pay more transaction fees to finance on the platform, thus minimizing the cost of financing with traditional financing methods. At the same time, the platform urges enterprises to make reasonable use of funds and reduce business risks by ensuring the distribution of the profits of priority investors. In addition, the platform pays more attention to the continuous operation ability and risk control ability of enterprises, and is also willing to provide financing for some small and medium-sized enterprises that meet the regulations.

3.1.3.2 Investor bargaining ability

1. At present, a large amount of social capital in China is in an idle state. On the one hand, many individual investors “have money and no investment” and their money are deposited in bank accounts, but bank interest rates are extremely low or even lower than inflation. On the other hand, even institutional investors who can take on higher risk will struggle to find the right higher-yielding investments. In this respect, investors have shown a lower bargaining power and are in urgent need of new good wealth management products.

2. The platform launches the REITs product to prioritize and sub-priority, priority products are available to the public on a regular basis, the priority setting is relatively higher than the income of the conventional low-risk investment (such as national debt, standard bank current time deposit), and through the enterprise itself to subscribe to the secondary limited. The protection of priority investors' income and margin mechanism, differential payment commitment, rating reduction commitment, priority open exit and liquidity support, and priority termination exit arrangements have effectively reduced the risk of priority investment. Investors have relatively low-risk, high-yield investments.

3.1.3.3 Potential competitor entry capability

The potential competitors of the platform mainly include banks, brokers, trusts, P2P platforms and other financial institutions with financing channels for enterprises.

1. Compared with banks and brokers, the platform has relatively stable financing costs and shorter financing time limits, which can increase the attractiveness of financing companies; at the same time, the priority REITs funds issued by the platform have relatively high returns and lower risk to meet the investment needs of risk averse.
2. Compared with the trust and P2P platform, the platform has a more complete risk control mechanism and a mechanism for safeguarding investors' rights and interests to ensure the safety of investors' funds.

Based on the above two points, the platform has competitive advantages in terms of speed, security, and revenue. Therefore, the potential competitors do not pose a great threat.

3.1.3.4 Alternative ability of substitutes

1. At present, the market substitutes are mainly asset-backed securities issued by the loan and asset securitization platform provided by microfinance companies. Among them, the loan procedures of microfinance companies are cumbersome and limited, and their own development also has difficulties in financing. The securities provided by the asset securitization platform are difficult to attract a large number of investors due to insufficient liquidity, which makes it difficult to meet the financing needs of enterprises. .
2. In contrast, the REITs fund issued by the platform has the characteristics of low financing threshold and effectively solves the problem of financing difficulties for SMEs. For enterprises that will have a large amount of cash flow in the future and generate a large amount of profit, they will achieve self-sustainability through the subscription of sub-funds by themselves, reduce the distribution of corporate profits, increase the retention ratio of corporate profits, increase the enthusiasm of enterprises and improve enterprise motivation. Therefore, li jin platform is more competitive than alternative platforms than small loan companies and other asset securitization platforms.

3.1.3.5 Existing competitors' competitiveness

The relevant laws on REITs are still blank in China, while attempts on similar REITs are few and far between. At present, there are great prospects for development in this field in China, and the existing competitors are neither large nor competitive.

1. Traditional financing methods

(1) Issuance of stocks: China's relevant laws have clearly stipulated that the issuance of stocks must be a company limited by shares and the issuance of stocks has a higher threshold, and has higher requirements on enterprises in terms of cash flow and net profit.

(2) Issuance of bonds: The Securities Law, the Company Law and the Pilot Measures for the Issuance of Corporate Bonds have imposed stricter requirements on the issuance of securities by enterprises. Ordinary companies still struggle to issue bonds, and bonds that do not reach AAA status in the current environment can easily go unsold.

2. Internet financial platform

(1) Third-party payment-type Internet financial platform: For example, Ant Flower Bud is mainly aimed at consumer financing, and there is little business in terms of corporate financing,.

(2) In recent years, the rapid development of P2P platforms has improved the imbalance between the supply and demand of funds, but relevant regulatory policies have not yet been implemented. As a result, the platform running events frequently occur, and the investment security and stability of investors cannot be guaranteed.

3.2 Competitive Analysis: SWOT Model

<div> <div>internal</div> <div>external</div> </div>	Strengths 1. Guarantee the safety and profit of priority funds 2. Reduce the risk of capital use through credit enhancement 3. Machine learning auxiliary line review, control risk from the source 4. Through the three-dimensional perfect risk control system enterprise risk carries on the omni-directional monitoring 5. Expand the scope of the financing scope (SMEs can also enter the platform financing)	Weaknesses 1. Initial establishment, low market visibility 2. The platform needs more business traffic to achieve profitability.
	Opportunities 1. High corporate financing needs 2. Social idle funds need investment channels that are relatively safe and have relatively stable income. 3. National policy laws encourage	Opportunities--Strengths Take advantage of the platform's competitive advantage, seize external opportunities, and actively enter the commercial real estate financing market while attracting investors.
		Opportunities--Weaknesses Seize the external opportunities, actively expand the platform visibility in the early stage, attract more commercial real estate financiers and investors, and enhance the platform's profitability.
	Threats	Threats--Weaknesses
	Threats—Strengths	

1. There are some competitors	1. Make full use of advantages and give play to competitive advantages	Constantly enhance their core competitiveness and enhance their competitive advantage in similar platforms, thereby weakening their disadvantage.
2. There may be credit risk	2. Use the platform's credit enhancement and Risk control measures to effectively reduce corporate credit risk.	

3.3 platform life cycle analysis

3.3.1. Investment period

At this stage, the platform occupies a relatively small market share, so it should expand the popularity of the platform through advertising and other means and improve the financing market share of the platform.

3.3.2. Growth period

At this time, financiers and investors are already familiar with the platform, and their popularity has been significantly improved. A large number of new financiers and investors have entered the platform and the market has gradually expanded. At this stage, the platform should seize the opportunity to enhance the loyalty of old users to the brand, and attract new users based on old users to form an ever-expanding user group so as to increase profits and seek further expansion.

3.3.3. Saturation period

Market demand tends to be saturated, potential users are few, and financing growth is slow, marking the platform's maturity. At this stage, competition increases gradually, and platform profits increase slowly or decrease. At this point, the platform should shift its attention from expanding the market to improving user stickiness and user experience.

3.3.4. Recession period

REITs listed and traded will be affected by the cyclical fluctuations of real estate and the overall cyclical fluctuations of the stock market. In the case of low real estate boom or high stock market risk, the level of income will be affected, resulting in investors' investment risks. It may face specific risks of other overseas investments, including exchange risk, foreign exchange control risk, and overseas tax law risk. In order to reduce risks, the platform has increased various credit enhancement methods such as margin mechanism, differential payment commitment, rating reduction commitment, priority open exit and liquidity support, and priority termination exit arrangements.

3.4 Financial Analysis

3.4.1 Financial income

Li Jin platform financial income mainly has the following aspects:

1. Income from the enterprise

The income that Li Jin platform receives from the financing company consists of two parts:

The first part, the interest rate income of corporate financing, the platform will set the financing rate as 5% of the financing amount.

In the second part, the service fee income of enterprise financing, the platform sets the service fee collection rate as 1% of the financing amount.

2. Income from the investor side

The income of the platform from investors is mainly the management fee of the special plan, that is, the management remuneration paid to the special plan manager. The cost of special plan management is 1.5% of the net asset value of the fund.

3. Investment income

The investment income of Li Jin platform is mainly the investment income of investing

in private equity funds.

3.4.2 Costs

Li Jin platform costs mainly have the following aspects:

1. Special plan custodian fees paid to special project trustees. The amount is generally 0.25% of the net asset value of the special plan.
2. Platform development and design costs.
3. Platform to obtain information costs
4. Platform human resource cost
5. Platform promotion expenses
6. Tax payable expenses

4. Part Four: Team culture

4. 1 about Team

4.1.1 Team members

Our team consists of 15 people, divided into technical group and financial group. And there are 2 instructors.

Captain: Chu Tianshuo

Technical team members:

Fang Lang, Quan Shenshen, Pang Jiaxuan, Chen Ziyi, Zhang Zehui.

Financial team members:

Zhang Zixuan, Liu Yuxuan, Zhang Yuning, Lu Jun, Gu Bing, Xin Xiaoqi, Cao Yajie, Lu Xuejiao, Lu Jiaduo.

Instructors:

Sui Cong, Gao Ming.

4.1.2 Team Logo

The central part of the platform logo is the three tall buildings representing the stable structure of housing, shopping malls and other real estate facilities. On the left side of the tall building is the gold coin, and on the right side is the income growth curve. Logo represents a new type of financial product with commercial real estate as the object of the special program, which is injected by investors to make profits together. At the same time, it shows that the product has low risk and good profitability.



Figure 4-1 team logo

4.2 Team Culture

Our team is:

1. Target team

Before the end of the semester, we made the decision to stay in the school in the summer vacation and prepare for the competition wholeheartedly. Everyone in the team has a common goal. In the process of research, we have set short-term goals, long-term goals, and ultimate goals, and have been on the road of finding dreams. In order to keep improving, we can repeatedly overturn the established completion model, and we can roll back on the sixth day without giving up after five days of discussion failures. We are not afraid of the thorns of the road. ” Where you want to go, you must act. Even if the road is dangerous, if we act, we must achieve our goals.” This is our common belief. When the teaching building is open, we will discuss together and listen to the sound of the waves outside the window. Before the closure of the teaching building, we left to enjoy the sunset together.

2. Cooperative team

In the process of preparing for the match, because of the complicated tasks, team

learning and cooperation have become an important means to study and solve problems, such as the cooperation between financial knowledge and computer technology, and the complementation of two people when studying problems. At the beginning of the competition, we encountered many problems, and the difficulty of competition was far beyond our imagination. We learn from each other and discuss with each other and gradually overcome difficulties in division and cooperation. Through cooperation, we really achieved the "1+1>2" effect.

3. Communication team

Team achievement is inseparable from the efforts of every member. Communication is particularly important in the process of cooperation. Communication includes two aspects: communication and listening. It is very important to exchange personal ideas when discussing the project, but the most important thing is to listen to each other and respect each other. Even if there are different opinions, they should wait until the speaker has finished speaking. This avoids inefficient arguments and respects others. Good communication provides a guarantee for our common progress.

4. "Deficit" team

To make up for the "deficit" is a major feature of our team. "Deficit" means that there will always be problems in some teams or slow progress in division and cooperation. At this time, a group or individual with a faster pace will take the initiative to participate in the "deficit" and help them overcome difficulties. Facts have proved that this "deficit" approach can not only speed up the research process, but also strengthen the links between the team members, and enhance team cohesion.

5. Rally Team

We have a large number of troops and we thought this would lead to a "loose sand" situation. But in fact, our team has a reasonable division of labor and has worked together to prove our team cohesion with practical actions. I remember that on August 1, the temperature in the downtown area of Dalian reached 36.8 degrees Celsius, which became the highest temperature in the downtown area of Dalian since 1951. The sun was burning and the sweat was pouring down on everyone, but our team was still all

there to continue the game research. We were as enthusiastic as ever, no one complained about the game, and some just laughed at Dalian's extreme weather in spare time. It is known to all that "never forget the beginning of the mind can be successful", but we do not know that there is another sentence that "The beginning of the mind is easy to remember, but the beginning and the end are hard to keep". It is the strong cohesiveness of the team that keeps us to the end, which makes us stand the test of bad weather, step by step to the end, and stick to it to finish our dream.

The vocality of sheng wanders at dusk, plucking the sunset glow. Coiling our hair up, that time the sea breeze overflows. That summer makes the best years, and we expect tomorrow. Finally, I would like to thank our team-mates who have been pursuing our dreams together this summer and the two instructors who have been responsible and helpful to us. Thanks for meeting. Live up to ourselves, live up to meeting.

Appendix

Appendix 1 Enterprise Learning Document Based on Machine Learning

This document mainly introduces the platform using machine learning technology, which uses the organic combination of SOM neural network model and LVQ neural network model to form a new composite neural network, which classifies enterprises to determine the standards for enterprise entry. The model largely avoids errors in the training and classification process due to the sensitivity of the neural network to the initial value, greatly reduces the training time, and significantly improves the operational efficiency and predictive ability of the composite model. The platform strictly controls the enterprise access of the platform through the characteristic indicators selected for the enterprise.

Appendix 2 Risk Control Model Description Report

The risk control model description report introduces the risk control model applied in

the platform risk assessment part, and writes in detail the theoretical basis and revision process of each component model of the risk control system, thus constructing the environmental risk index, financial risk index and default risk index. The Trinity's risk prediction and evaluation system, and examples show the entire risk control process.

Appendix 3 REITs Valuation Model Document

This document is a report on the valuation model of REITs. It belongs to the valuation part of enterprise asset-backed securities in the background operation of SPV, and mainly realizes the valuation of REITs to be issued by enterprises. The document is based on the development of China's leased REITs. The first part first outlines the importance of REITs valuation; the second part starts from the existing three valuation methods, weighs the pros and cons, and chooses the basic valuation plan; the third part is The existing schemes are improved, and the calculation formula, data processing and its running logic are briefly described. The fourth part is case analysis through examples, and the accuracy of the scheme is evaluated, and the corresponding conclusions are drawn in the fifth part.