



VALUATION OF PHARMACEUTICAL PATENTS: A COMPREHENSIVE ANALYTICAL FRAMEWORK BASED ON TECHNOLOGICAL, COMMERCIAL AND LEGAL FACTORS

Valuation of Pharmaceutical Patents: A Comprehensive Analytical Framework Based on Technological, Commercial, and Legal Factors

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Yuanjia Hu
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HK, August 6, 2015

Introduction



high-cost and high-risk

**PATENT
PROTECTED**



Patents play a critical role in the research-based pharmaceutical industry



\$12.6 BILLION



¥ 8 MILLION



Generic alternative

Introduction

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Specific drug patents have been evaluated **technologically**

Shi ZH, 2014; Geldenhuys WJ, 2014; Nakajima K, 2014; Winum JY, 2013

General (non-drug-specific) patent valuation models have been successfully developed by **economists**

Schankerman M, 1986; Harhoff D, 2003; Reitzig M, 2006; Deepak H, 2009

Any direct application of existing approaches to the pharmaceutical patent valuation faces significant challenges



Existing patent valuation methods

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The present study focuses on the market value of a patent, which can be defined as the difference between **discounted future profits** accruing to the patent holder during the remaining lifetime of the patent and their **likely profits** if the patent were held instead by the strongest competitor in the field

Market benchmarking methods

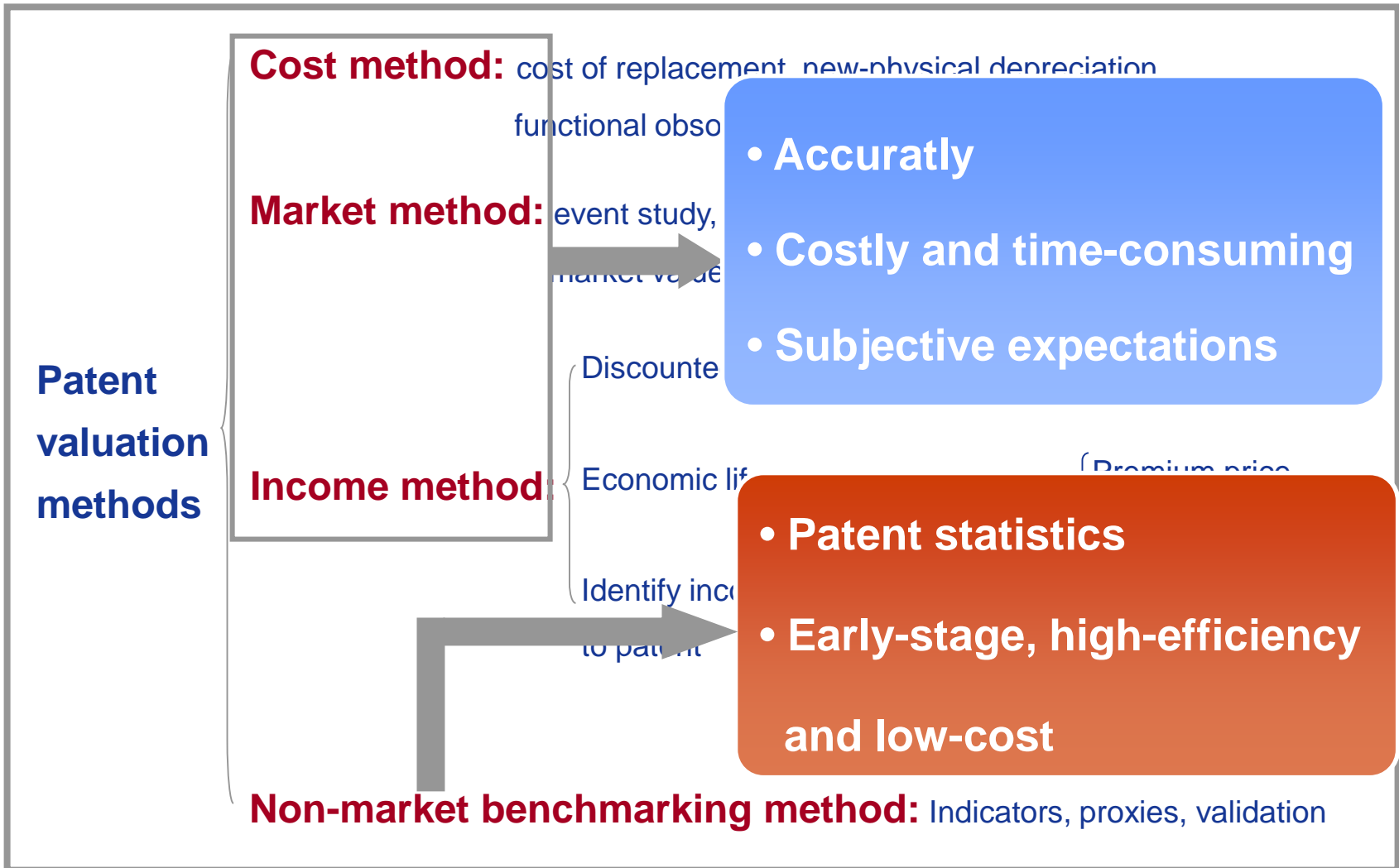
- income method
- market method
- cost method

Non-market benchmarking methods

- based on statistics of patent indicators
- early-stage
- high-efficiency
- low-cost estimations

Existing patent valuation methods

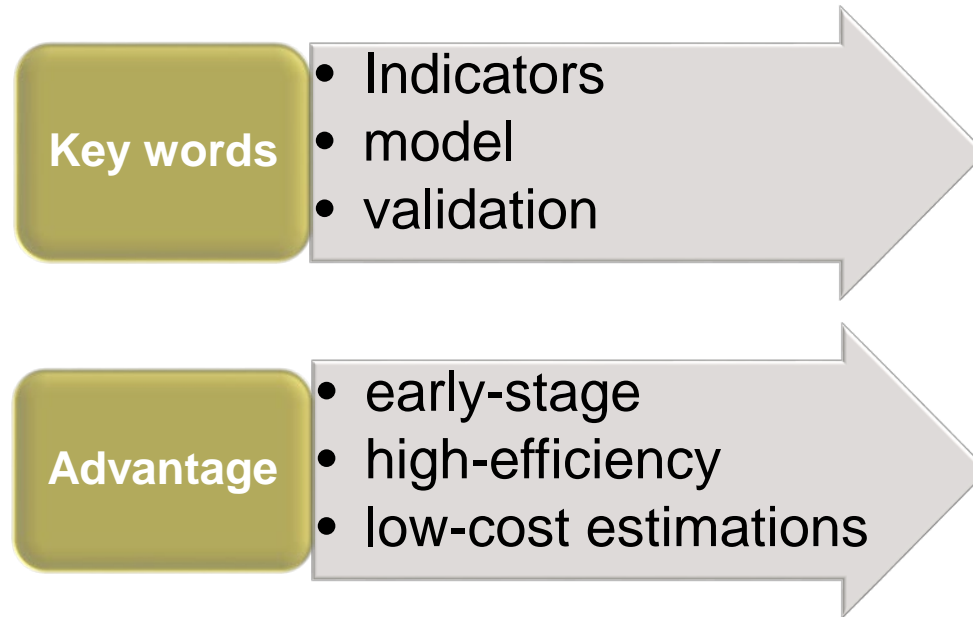
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Existing patent valuation methods

6

Non-market benchmarking methods

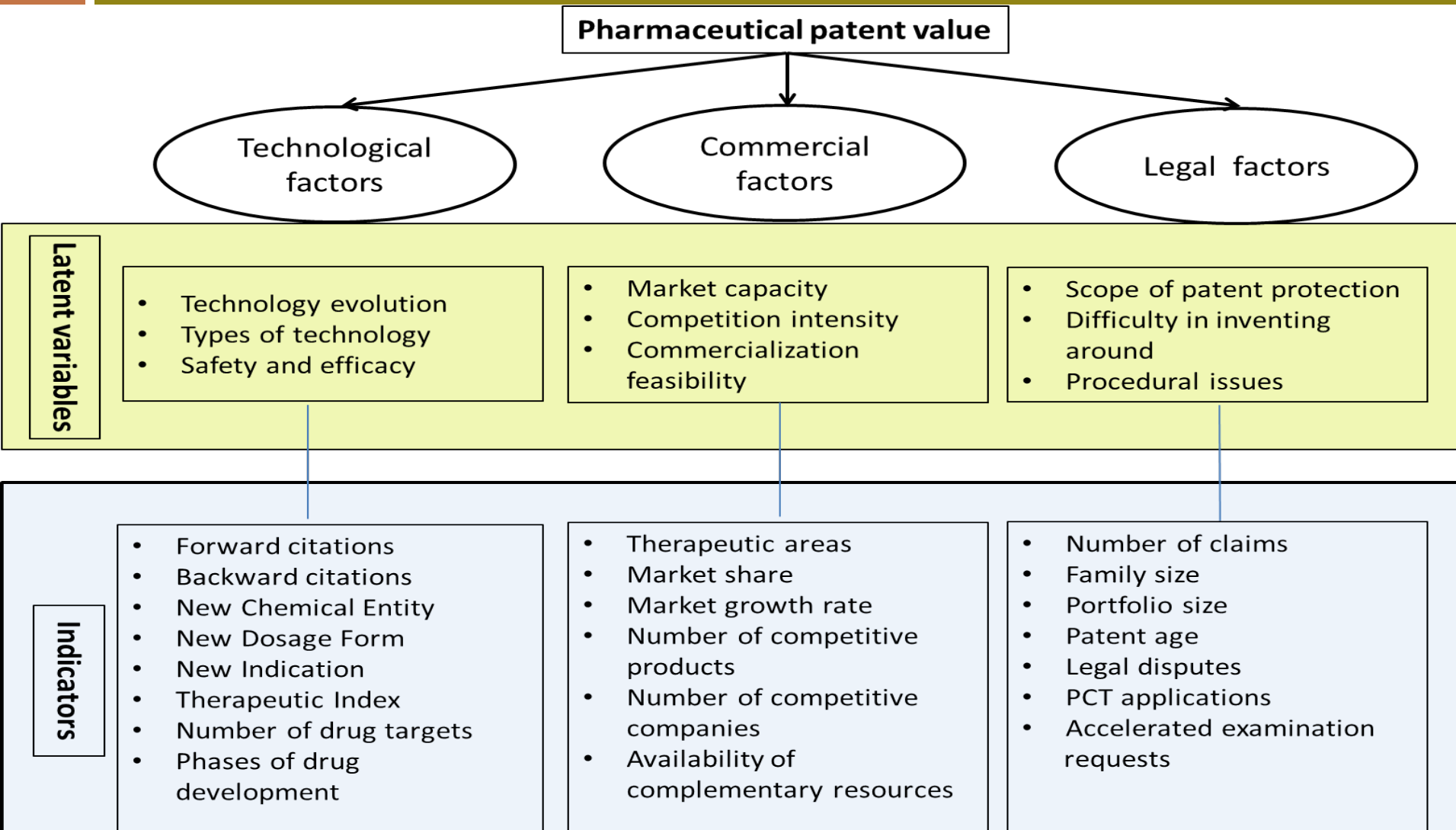


Disadvantage

- Existing non-market benchmarking methods have application mainly to **general and multi-industry patents**, taking little account of the specific technological factors, in order to ensure their relevance to various industries.
- They fail to take account of **key technology factors** in this sector such as chemical process, dosage form and clinical indication.

An analytical framework based on technological, commercial and legal factors

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Technological factors

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Technology evolution

Backward and forward citations

Patent citations indicate the position or value of a patented technology in the overall evolution of a technology.

Types of technology

New chemical entity

New dosage form

New indication

Drug safety and efficacy

Therapeutic index

Number of drug targets

Phases of drug development: Discovery, preclinical study, clinical test (Phase I, II and III) and marketed stage

Commercial factors

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Market capacity

- therapeutic areas
- market share
- market growth rate

Market competition intensity

- competing products and companies

Commercialization feasibility

- availability of complementary resources

Legal factors

10

Scope of patent protection

- Number of claims
- Family size

Difficulty in inventing around

- Patent portfolio

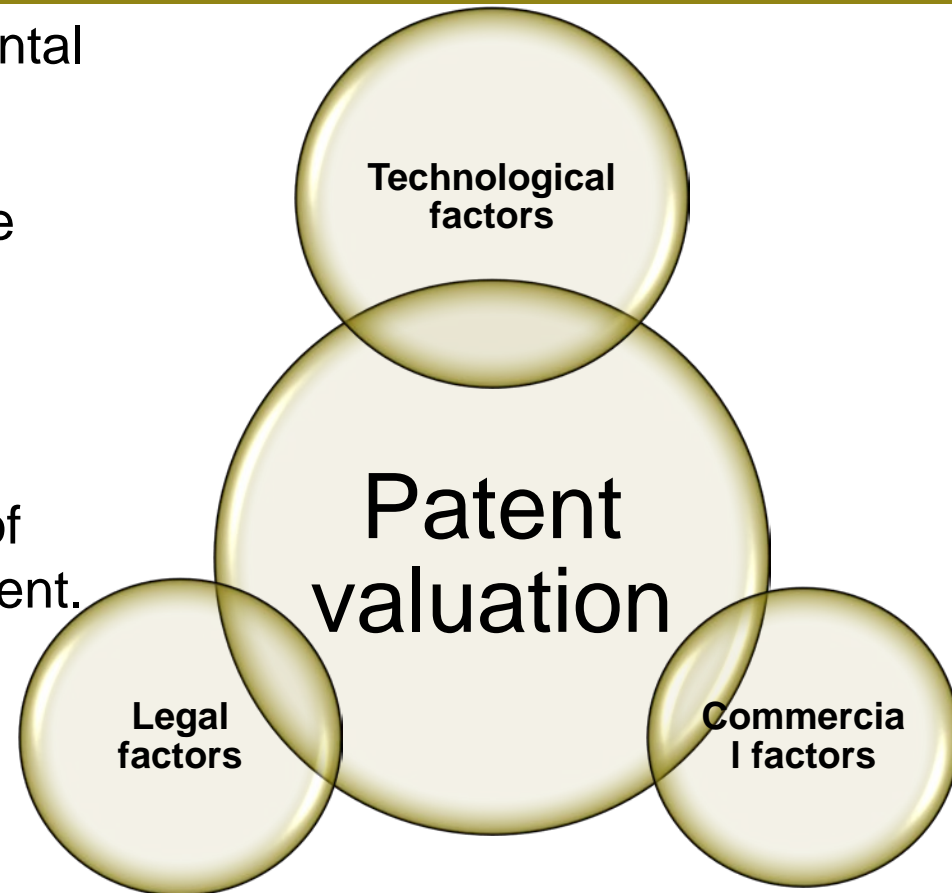
Procedural issues

- Patent age
- Legal disputes
- Patent cooperation treaty
- Accelerated examination requests

Concluding remarks

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- **Technological factors** are fundamental to pharmaceutical patent value;
- **Commercial factors** are prerequisite elements in the process of commercializing technology outputs;
- **Legal factors** are the best shield in sustaining the high economic value of innovation in a competitive environment.



The proposed framework has the advantages of high effectiveness, early predictability and easy accessibility in the analysis of pharmaceutical patent valuation.

Introduction of intellectual property pledge financing services

Haike Intellectual Property Exchange Co.,LTD
Tianjin Xingtai Certified Public Valuation Co.,LTD

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I . The definition of intellectual property pledge

✧ Intellectual Property Pledge refers to a financing activity in which the intellectual property rights holders obtain funds from banks or other financial institutions by taking their property rights in the intellectual property as subject matter of pledge.

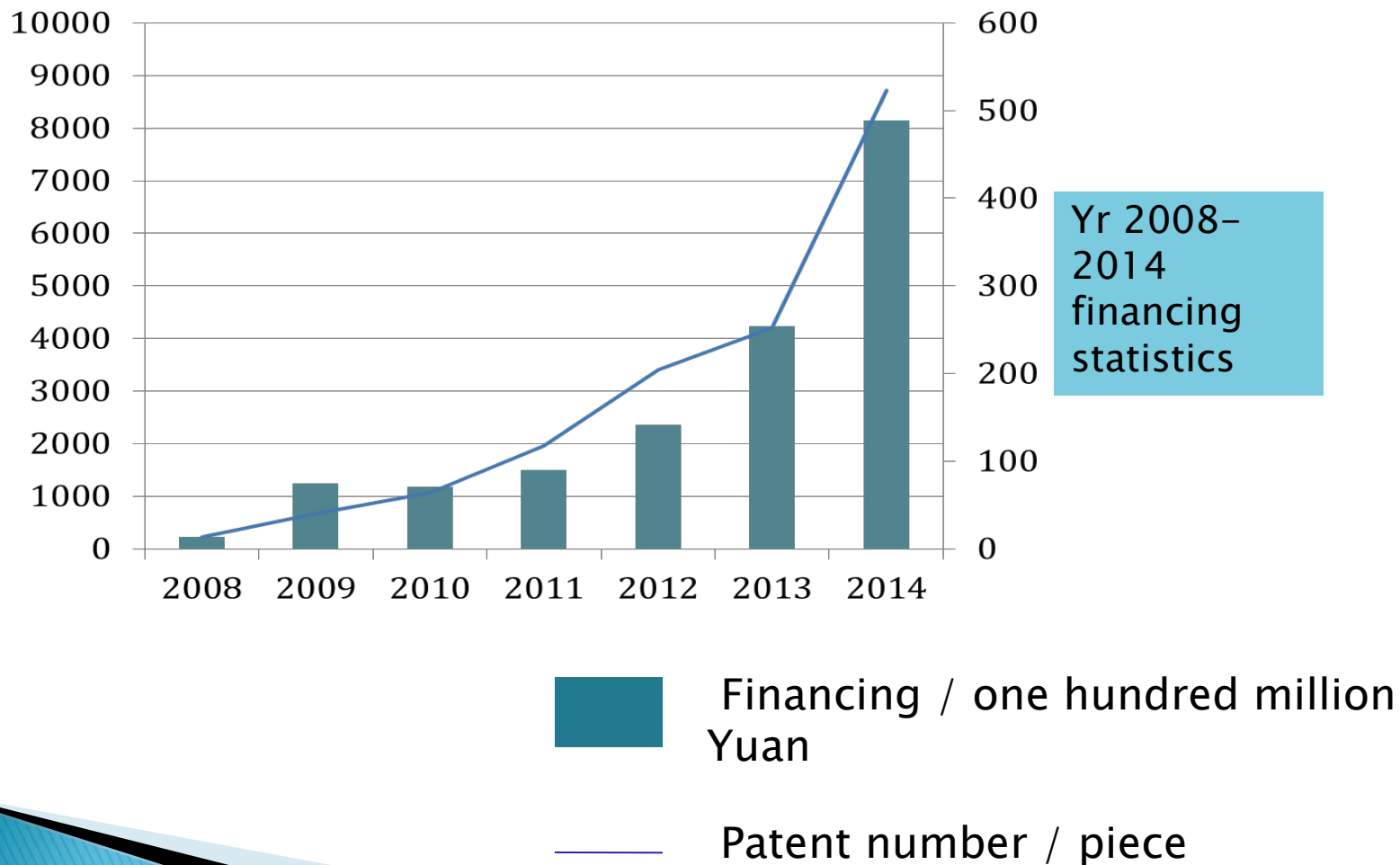


II. Background and development of intellectual property pledge

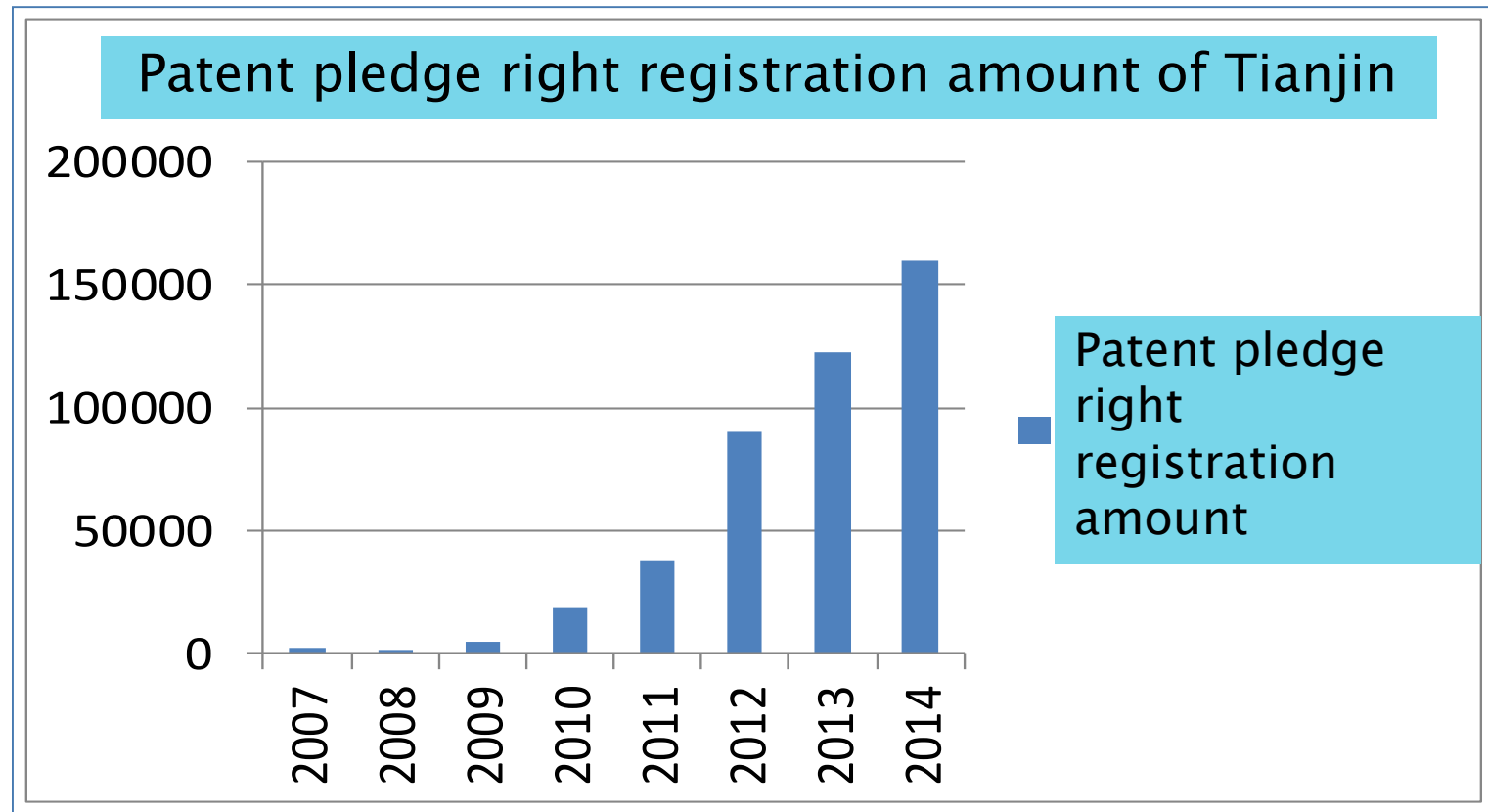
※ Background

- China has successively issued a “patent pledge loan management contract”, the “pledge of trademark registration procedures” and “copyright pledge contract registration management”.
- Local governments are very concerned about the development issues of local small and medium enterprises, especially those with independent intellectual property rights of high-tech and innovative. Its purpose is to solve the difficult problem of SME financing.

i . Year 2008-2014 China's patent pledge financing statistics



ii .Year 2007-2014 Tianjin patent pledge financing chart



Ⅲ. Financing business of Intellectual property pledge

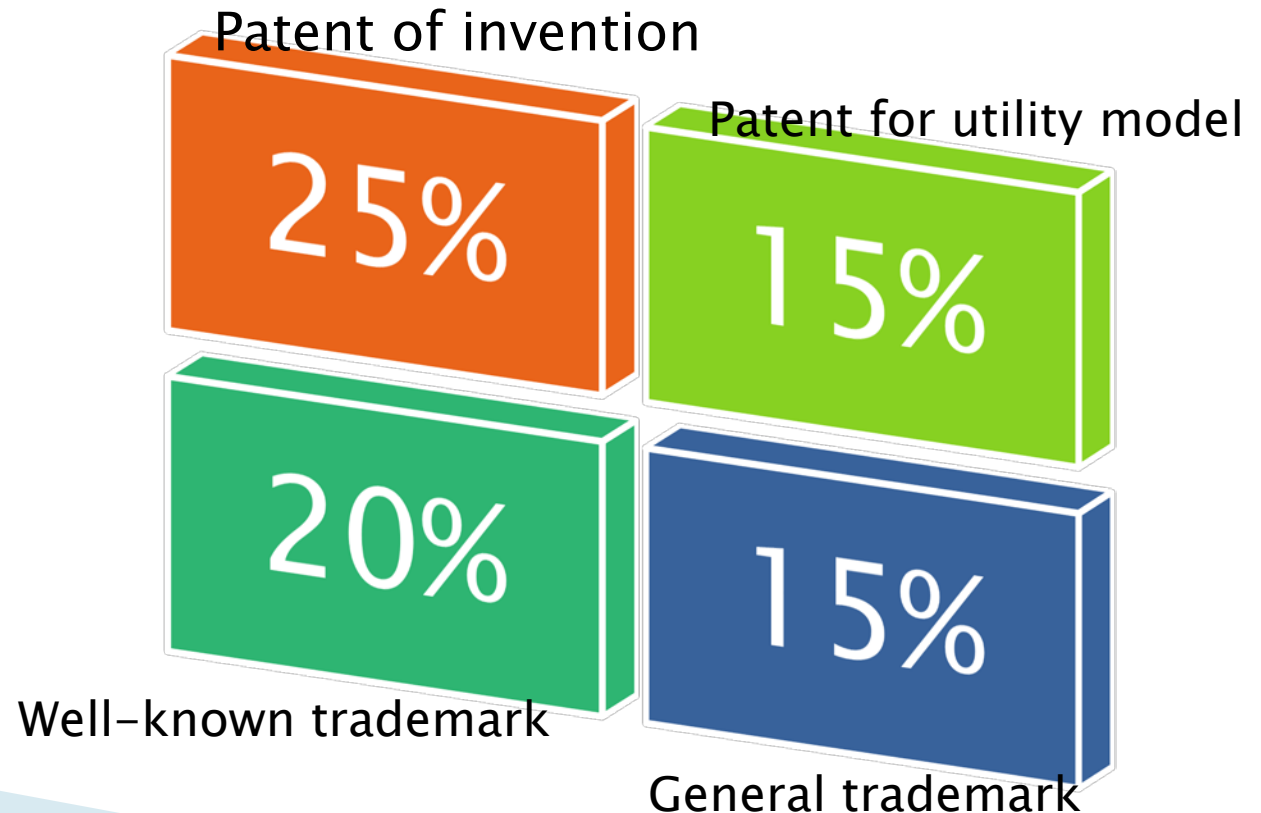
i . Business Features

- Activating the economic value of intangible assets
- Multi-agency work together
- Government subsidies
- Profits of enterprises



ii . Credit Factors

- ▶ Line of credit: up 50 million Yuan
- ▶ Credit period: up to 1 year
- ▶ Pledge rate: 15% –30%



IV .Intellectual property pledge financing Points

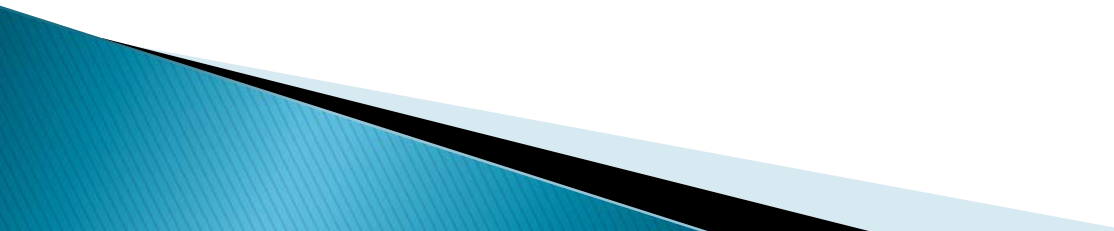
i . Loan principal requirement

- Trade and Industry approved and registration for annual check procedures, a good reputation, has two years (including 2 years) operations and earnings record.

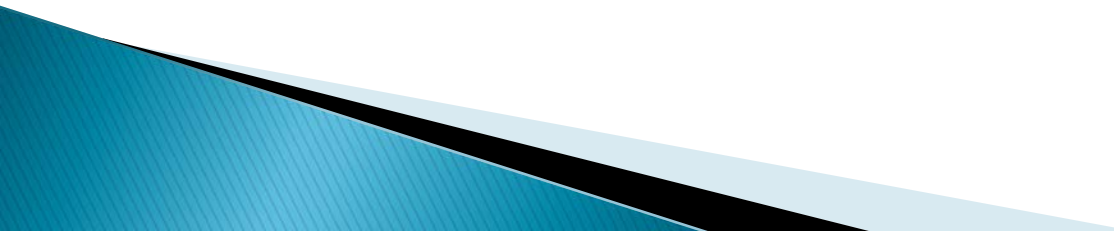


ii . Collateral requirements

➤ Patent

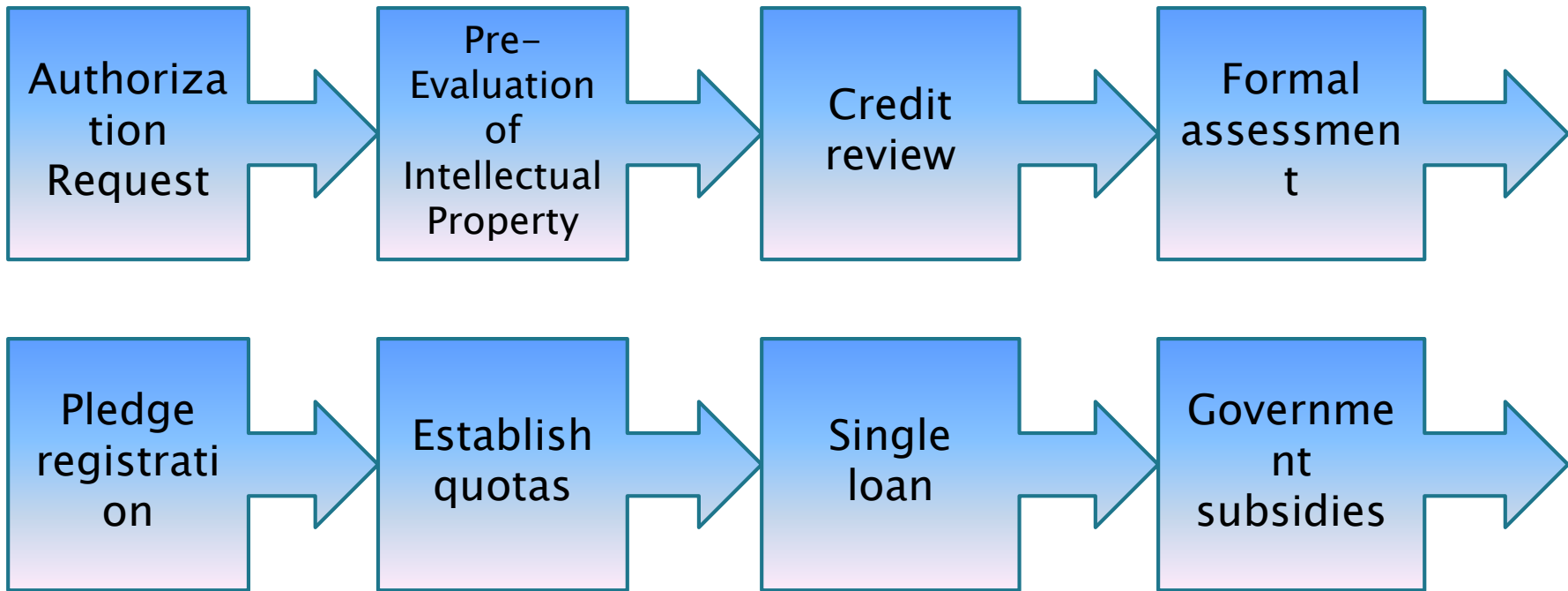
- Patent of invention and utility model patent have been approved.
 - Patent has been implemented at least 2 years, and to loan the filing date, the patent is still in use, and maintain profitability.
 - Calculated from the date of loan application, patent remaining valid for not less than eight years, utility model patent remaining period which shall not be less than 4 years.
- 

▶ Trademark

- Trademark registration has been approved by the Trademark Office, and is valid registered trademarks.
 - Trademark has been used on a product or service at least 2 years or more, and there is profitability.
 - The range of services or products used within the trademark registration.
- 

V. Intellectual property pledge financing business processes and content

i. Business Process

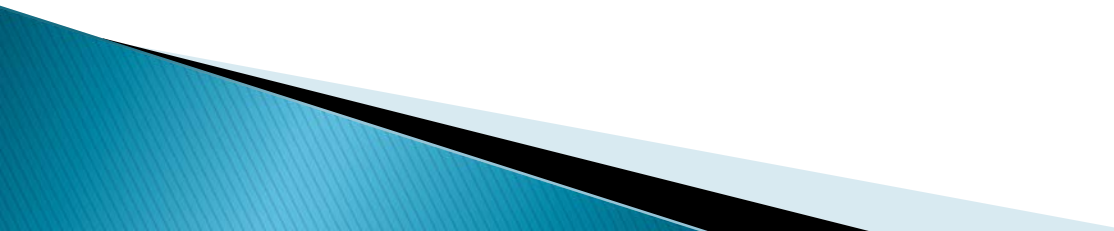


ii . Problems and Suggestions

※ Problems

- Intellectual property law is incomplete.
- Intellectual property value is difficult to determine.
- Intellectual property pledge financing risks.
- Banks' ability for manage intellectual property rights is not mature enough.
- The possibility of the realization of intellectual property is not easy to predict.

※ Suggestions

- To establish a legal system of modern security right.
 - To establish and improve the intellectual property valuation system.
 - To establish a loan risk compensation fund.
- 

iii . Companies finance innovation success cases

Company Name	Loan	Amount
Guangdong XX Underwear Co., Ltd	Trademark pledge loan	Five million
Guangdong XX Plastic Machinery Co., Ltd	patent pledge loan	Four million
XX Guangdong Furniture Co., Ltd	Trademark pledge loan	Forty million
Guangdong XX gold Co., Ltd	Trademark pledge loan	Ten million
Guangdong XX Cable Co., Ltd	Trademark pledge loan	Ten million
Guangdong XX Medical Technology Co., Ltd	Patent pledge loan	Ten million
Foshan XX Mattress Machinery Co. ,Ltd	Trademark, patent pledge loan	Nine million
Foshan XX Material Co., Ltd	Trademark pledge loan	Five million
Foshan XX Textile Co., Ltd	Patent pledge loan	Four million
Foshan XX Aluminum Co., Ltd	Trademark pledge loan	Three million

iv. Xingtai's intellectual property pledge success cases

No.	Report No.	Company Name
1	200009	Tianjin XXXX Technology Co., Ltd.
2	200014	Tianjin XX Energy Development Co., Ltd.
3	200022	Tianjin XXX Animation creative Ltd.
4	200023	Tianjin XX Agricultural Science and Technology Development Co., Ltd.
5	200033	Tianjin XX Fiber Co., Ltd.
6	200051	Tianjin XX Horticulture Environmental Technology Engineering Co., Ltd.
7	200060	Tianjin XX Digital Imaging Technology Co., Ltd.
8	200066	Tianjin XX Magnetic Materials Co., Ltd
9	200071	Tianjin XX Science and Technology Co., Ltd.
10	200072	Tianjin XX Heat Transfer Equipment Co., Ltd.



Thank You !

