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How do Chinese industry experts assess the impact of intangible assets on the valuation of pre-profit innovative drug companies?

Ting (Linda) Guo

Prof Marco Heimann

Student: Ting (Linda) Guo

Mail: ting.guo83@outlook.com

Self-Introduction

Name：Linda (Ting) Guo

Supervisor: Prof Marco Heimann

Company: Pre-profit innovative drug company in SuZhou Industrial Park,China

Work Experiences: Completed multiple equity rounds,from 2015.

Cumulative RMB 1.3billion raised.

Completed 2 companies's IPO.

Current firm processing for HKEX listing.

Title: How do Chinese industry experts assess the impact of intangible assets on the valuation of pre-profit innovative drug companies?

1. Research Motivation

SuZhou Industrial Park：Core area of the "China Medicine Valley",founded1994. Cooperation between **China and Singapore.**

Figure 1 Aerial view of Suzhou Industrial Park

Suzhou Industrial Park ranks No1 in China biomedical industry parks ,in terms of industrial competitiveness and talent competitiveness.

- 2,000+ biomedicine companies
- Industrial scale RMB 250 billion
- 12 listed companies of innovative drugs
- 120+new drugs in the clinical stage
- 60,000 innovative talents in biomedical field

Gap: China's share of global first-time innovative-drug approvals nearly 38% in 2024. However, the related valuation system is still being established, with gaps in methodological depth and practice consensus.

1. Research Motivation

Figure 2 shows China's innovative-drug market expanded to USD 159.2 billion in 2024, with its global share holding at around 15%.

Figure 2. China's innovative drug market size and global share

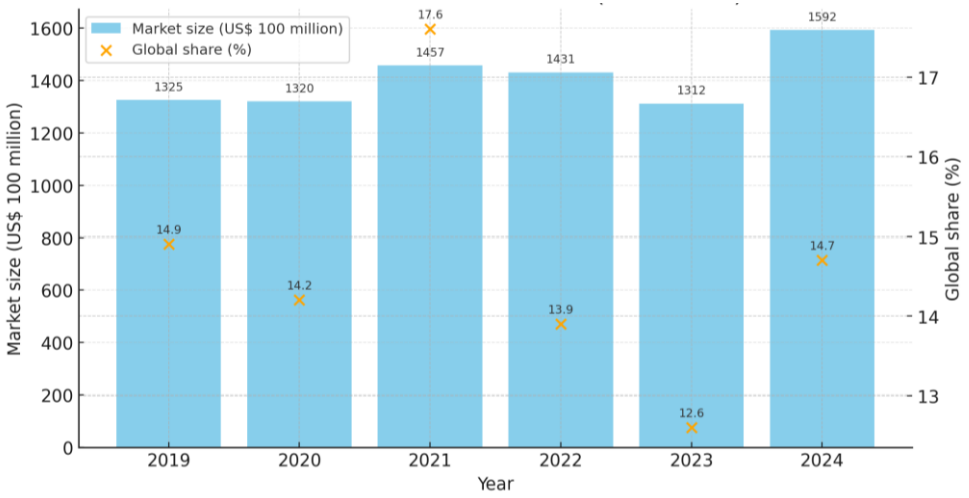
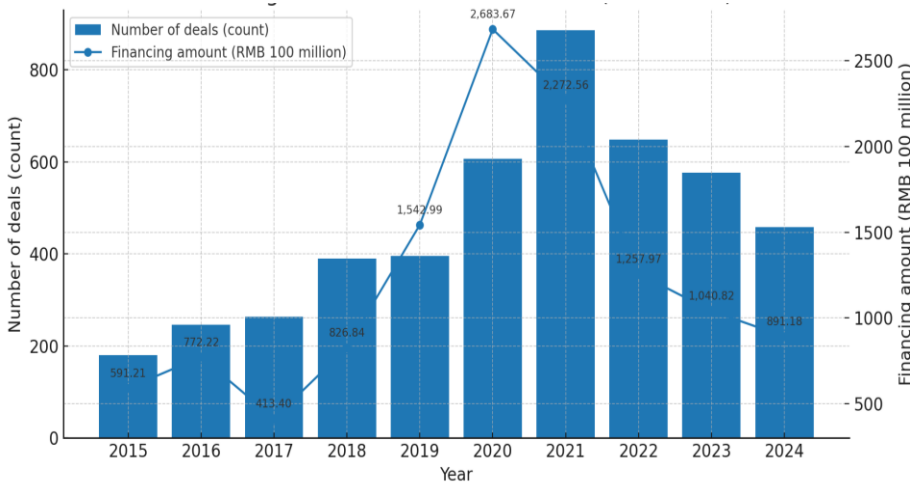


Figure3 shows that the cumulative financing in China's innovative-drug field exceeded RMB1.23trillion, injecting substantial capital momentum into the sector's breakout expansion.

Figure 3. Financing overview for China's innovative drug sector



Source: PharmCube InvestGO database.

2. Research question

2.1 Key challenges

- China's capital markets have developed rapidly, but valuation practice has not kept pace(Li, 2023)，the valuation method DCF and PE is conflict for pre-profit innovative drug companies.Intangible assets constitute the most critical component of firm value.However, Systematic quantitative studies in China remain scarce.theoretical progress lags behind market practice, and valuation biases persist in capital allocation.

2.2 Question

How do the intangible assets (IAS)—pipeline, patents, platform/technology, team, and brand, effect on the valuation premium (EVP).It includes the following two points：

(1) How do the specific intangible assets (pipelines, patents, technologies, teams, brands) affect the valuation premium (EVP)?

(2) Does the regional innovation environment (RIM) moderate the relationship between the intangible asset valuation (IAS) and expert valuation premium (EVP)?

3.Research Objectives

(1) Assess the affect of IAS in expert valuation premium

(2) Analyse the moderating role of RIM in expert valuation premium

(3) Provide evidence-based recommendations for businesses and policy makers

4. Literature review

4.1 Literature Streams

Intangible asset disclosure is positively associated with market value, but investors still lean on profitability. Effects vary by country and sector (Bagna, E., Gnan, L. and Rizzotti, D, 2024).

Intangible assets such as patents, technology platforms, and candidate drug pipelines not only embody competitive advantage but also form the key basis on which investors assess a firm's future value (Chong and Li, 2020).Among affiliates of the Renault Volkswagen group,team diversity can contribute to profitability and, by extension, to higher valuations (Velinov, 2023).

The distinctive institutional matrix within Chinese valuation experts ,fostering a valuation culture ,that differs in important respects from prevailing western approaches.Today's emerging-market and biotech-specific contexts may require updated evidence.

4.2 China Research

Chinese confirms a positive association between intangible assets and firm value, but most empirical verification remains confined to listed firms and constrained by accounting-based definitions.

Marketed products and candidates at different R&D phases into four pipelines and discount expected cash flows by stage, probability of success, and market outlook illustrating the practical applicability of pipeline valuation to innovative drug firms (Bai, Yetal., 2023).

4. Literature review

Regional policy and agglomeration effects shape valuation patterns (Han, 2023).

Innovative drug firms are primarily driven by intangibles R&D pipelines and IP, whose gross margins can exceed 90%, so investors should emphasize indication breadth, clinical success probabilities, and cross-border licensing (CN-Healthcare, 2023).

4.3 summary and gap

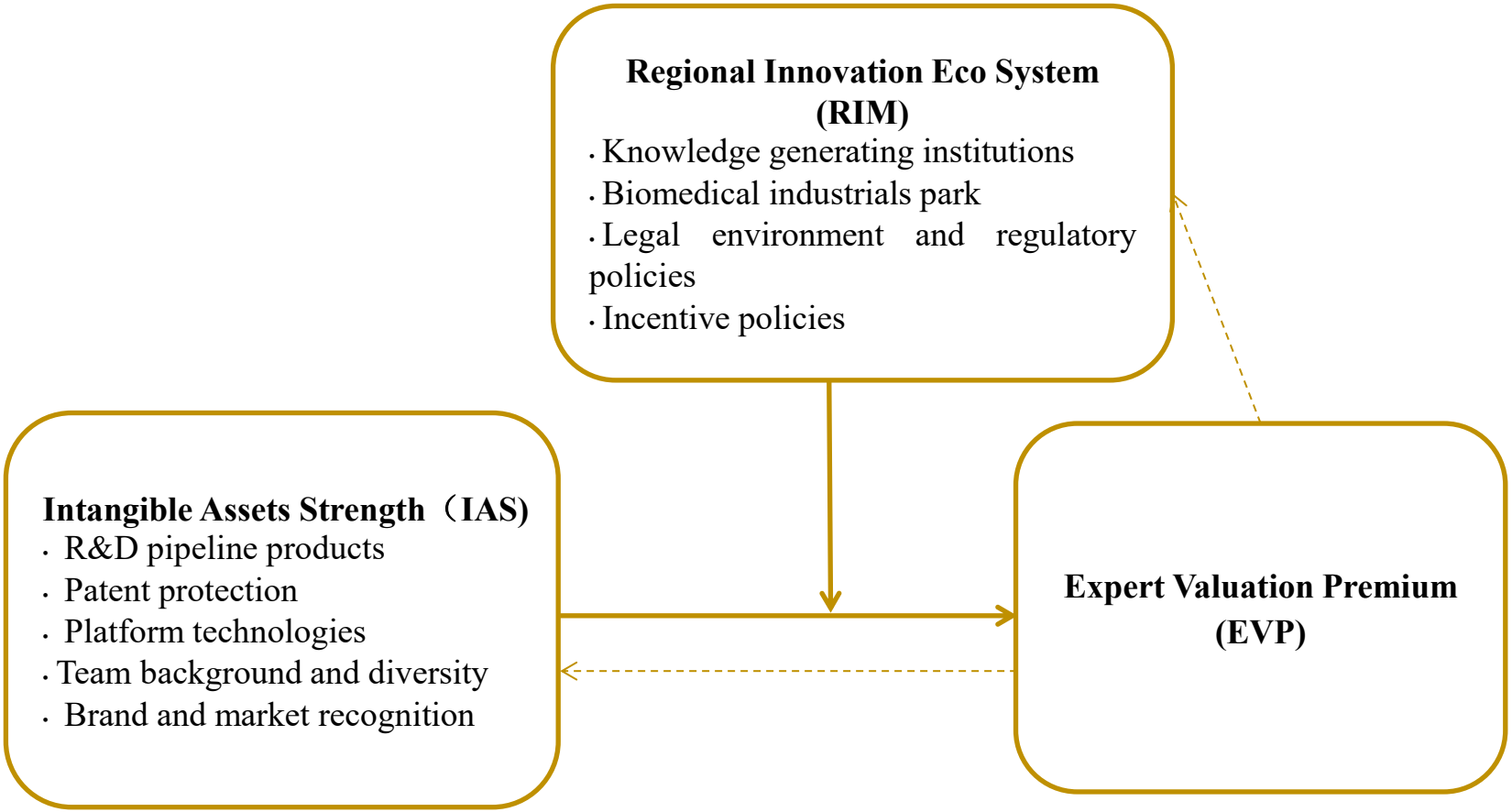
(1) Summary

Imam, Barker, and Clubb (2011), finds that discounted cash flow(DCF)and price Earnings (P/E) are the most commonly used valuation models across industries. These approaches are effective for firms with stable cash flows and asset bases dominated by tangibles.non cash flow driven business models fundamentally conflict with DCF and PE Models.

In early, pre-pfofit stages, intangibles become the primary basis on which markets and experts assess firm value. The strength of intangible assets has meaningful predictive power for value, reinforcing this view (Gofman, 2021). The National High-Tech Zone policy indicates that regional support positively steers firm vahinese innovative drug companies often leverage regional clusters, policy support, and infrastructure to attain greluations (Han, 2023).

(2) Gap lack of a model tailored to China based on expert opinions

5. Analytical Framework



6.Research hypotheses

- **H1 Main effect**

H1 Intangible-asset strength IAS is positively associated with EVP across all dimensions (H1a–H1e).

Bagna, E., Gnan, L. and Rizzotti, D (2024) finds that intangible asset disclosure is positively associated with market value.Effects vary by country and sector uses panel data on 250 firms in France, Germany, and Switzerland (2009–2018).

Chong and Li (2020) find that intangible assets such as patents, technology platforms, and candidate drug pipelines form the key basis on which investors assess a firm's future value.

Kim (2025) examines the impact of board diversity on strategic decision-making in pharmaceutical companies, provides indirect evidence that heterogeneous board backgrounds add value to risk management and to how the market perceives firms.

6.Research hypotheses

- **H2 Moderation**

RIM positively moderates the IAS→EVP relationship

Han (2023) uses the national high tech zone policy as a quasi-natural experiment with city-level data from 2000–2020, finds that the policy improves capital market performance and valuations. Especially for pre-profit, technology intensive firms. The effects are pronounced for local SMEs in pharmaceuticals and biotechnology, indirectly raising expectations of future market value and investment attractiveness.

- **H3 Robustness**

The main effect and moderation effects remain significant ($p < 0.05$), under OLS with robust errors, alternative outcome (premium based on a comparable approach).

7.Research Methodology

7.1 Questionnaire survey and cluster analysis

(1) A questionnaire survey renders experts' tacit judgments explicit.

(2) Cluster analysis uncovers heterogeneous structures in expert valuation styles, and/or firm/region typologies

7.2 Target Respondents

(1)Scholars and researchers in the study of innovative pharmaceutical stocks.

(2) Investment managers and registered medical analysts.

(3)Senior management and BD directors of Chinese innovative pharmaceutical Enterprise.

7.3 Sample size 250 experts

7.4 Professional ethics

（1）**Informed consent and Voluntariness** Participants will receive an informed-consent form prior to participation. Participation is voluntary, and respondents may withdraw at any time.

（2）**Anonymity** No directly identifiable personal information will be collected, only data necessary to complete the study will be gathered. Results will be published in anonymized form to protect respondent privacy.

7.Research Methodology

Research Objectives	ResearchAims	Hypotheses	Methods&Measures	ExpectedResults
The effect of intangible asset (IAS) on expert valuation premium (EVP) in pre-profit innovative drug companies.	Clarify the overall relationship between IAS and EVP.	**H1 (Main effect):** IAS is positively associated with EVP, with anticipated positive effects across all IAS dimensions (H1a–H1e).	Measures: Expert survey scores (EVP);IAS dimension indicators (pipeline, patents, platform, team, brand). Method: OLS regression.	IAShas a significant positive impact onEVP($p < 0.05$).
Decompose IAS into five dimensions to identify their differentiated impact on EVP.	Assess the relative importance of each IAS imension in expert valuation.	**H1a–H1e:**- Pipeline (conversion rates, milestone attainment)- Patents (counts, coverage, quality)- Platform/Technology (hard-to-imitate processes, maturity, learning-curve advantages)- Team (educational attainment, diversity, industry experience)- Brand (recognition, partnerships, milestone disclosures).	Measures: Quantitative indicators for each dimension:- Pipeline: number of projects/phases, success rate- Patents: counts, geographic coverage, citation strength- Platform: process maturity, learning curve- Team: education level, diversity index, industry years- Brand: collaborations, disclosure quality.	H1a–H1e: All dimensions have positive effects on EVP ($p < 0.05$). Anticipated ordering: Pipeline & Patents carry greater weight.
Investigate the moderating role of regional innovation milieu (RIM).	Test whether RIM amplifies the IAS–EVP relationship.	**H2 (Moderation):** RIM positively moderates IAS→EVP. In high-RIM regions, the IAS→EVP slope is steeper and the marginal effect stronger.	Measures: RIM indicators (patent density, number of research institutions, policy support). Method: Interaction term IAS× RIM; OLS with Johnson–Neyman analysis.	In high-RIM regions,IAS has a stronger marginal effect on EVP. At moderate-to-high RIM, the effect remains significant.
Validate the robustness of the results.	Ensure conclusions are not dependent on specific model settings.	**H3 (Robustness):** The main and moderation effects remain significant across alternative model specifications.	Methods: OLS with robust errors; 1%/99% prioritization; log transformation; alternative outcome (comparable approach).	Effects remain directionally consistent and significant across robustness checks ($p < 0.05$).

8. Data Analysis Plan

8.1 Software SPSS (PROCESS v4) or R (process, sandwich).

8.2 Cleaning and bias Checks

a. Remove straight liners and cases with >20% missing.

b. Harman single factor < 40%; VIF < 3.3.

8.3 Scale Construction

a. Factor loadings ≥ 0.50.

b. Cronbach's α ≥ 0.75; z-standardize composites.

c. WinsorizeEVPat 1st/99th percentiles.

8.4 Moderation (Preacher & Hayes)

Set the outcome Y= expert valuation premium (EVP), the focal predictor X= intangible-asset strength (IAS), and the moderatorW=regional innovation milieu (RIM).

Estimate a moderated regression with 5, 000 bootstrap resamples (bias-corrected and accelerated).

Probe the simple slopes of IASat low (−1 SD), mean, and high (+1 SD)levels of RIM.

Johnson–Neyman intervals to delineate the RIM values for which the IAS effect on EVP is statistically significant.

9. Expected results

9.1 Main and Component Effects

H1 (Main effect): Firms' intangible asset strength (IAS)is positively associated with expert valuation premium(EVP). The key components of IAS each have a positive effect on EVP.

H1a R&D pipeline: Higher expected conversion rates or faster attainment of R&D milestones → higher EVP.

H1b Patent: Patent counts, geographic coverage, and citation/claim quality →EVP+.

H1c Platform/technology: Hard to imitate processes, platform maturity, and learning-curve advantages →EVP+.

H1d Team: Higher educational attainment of the core team, greater diversity, and richer industry experience →EVP+.

H1e Brand and market recognition: Brand acceptance, international collaborations, and quality milestone disclosures →EVP+.

9. Expected results

9.2 Direct and Moderating Role of RIM

H2 (Moderation effect): RIM positively moderates the IAS→EVP relationship.

In high-RIM regions, a one-unit increase in IAS yields a larger valuation premium(a steeper slope).When RIM is at moderate to high levels, the marginal effect of IAS on EVP is significant and strengthened.

9.3 Robustness

The main and moderation effects are significant under OLS with heteroskedasticity consistent($p < 0.05$), and an alternative outcome(premium based on acomparable approach).

10.Implications (Managerial)

10.1 Allocate Resources Via Three Premium Channels

Strengthen enforceable patents and process-related trade secrets，Prioritize investments that shift Bayesian priors,Enhance negotiating power through team reinforcement.

10.2 Embed RIM in Location and Partnerships

Favor regions with dense knowledge institutions, mature CRO/CMO networks, and predictable pharmacopoeia policies, co-develop translational -medicine platforms and so on.

10.3 Transactions and Financing

Stage license/milestone economics around POC, in high RIM settings, target higher economics or co-development shares, ensure auditable, traceable milestone disclosures.

10.4 Guidance for Investors and Research Teams

Align screening and IC material with IAS dimensions, prohibit reliance on single metrics. In strong RIMs, permit wider premium ranges(per H2/H3).

10. Implications (Policy / Eco system)

10.5 Guidance for Parks and Policymakers

Knowledge institutions: Expand clinical trials capacity and mutual recognition of data,establish joint transitional-medicine funds and shared platforms.

Anchor firms: Attract high-quality companies to set up local R&D centers, strengthening the regional innovative-drug eco system.

Policy clarity: Issue transparent, actionable industrial-policy instruments; shorten approval timelines; set measurable KPIs, integrate CRO/CMO/tech-transfer/legal services, and provide fast-track land-use approvals for clinical trials. Raise regional valuation capacity and the pricing ceiling for high-quality projects.

Case： BeiGene's market value has soared from RMB 250 billionin 2023 to RMB 377.5 billion yuan 2025, driven by **a triple force of policy dividends (extended pricing rights), technological advantages (BTK platform), and global cooperation ,** fully demonstrating the combined effect of ecosystem factors.

11. Contributions to Knowledge

11.1 Theoretical

Conduct an empirical study on China's unprofitable innovative drug industry, incorporate regional context (RIM) for localization improvement, and make the theoretical framework more suitable for the actual scenarios of emerging markets.

11.2 Practical

- **Practical guidance for corporate management, investment judgment**

  Help management formulate more rational financing strategies, assisting investors in refining decision model, reduce valuation perception gaps and improve capital-allocation efficiency across the sector.

- **Enriching a China-specific theoretical lens on innovative-drug valuation,** providing theoretical under meanings for building a localized, systematic valuation model for pre-profit innovative drug companies

12. Limitations & Future Research

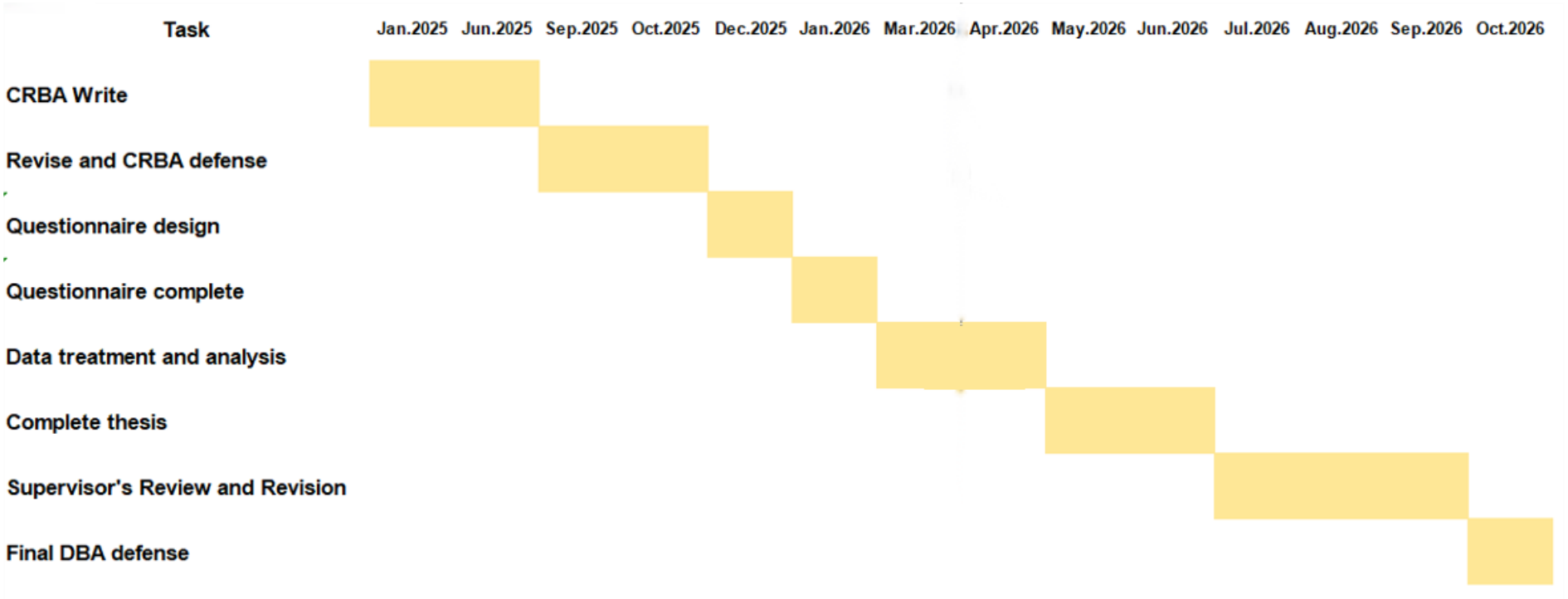
12.1 Limitations

- **pre-profit** innovative pharmaceutical enterprises are mainly small and medium-sized Biotech companies. However, such enterprises often do not publicly disclose the details of their core intangible assets which may lead to a sample bias towards leading Biotech companies.
- **Survey bias or subjectivity in expert assessments**
- **Industry specificity limits transferability**

12.2 Future Research

- Future-1 (Comparison with Market Outcomes): Align the expert's hit rate/calibration with event excess returns,refinancing pricing deviations, and commercialization realization.
- Future-2 (Longitudinal Study): Conduct rolling re-evaluations (6-12 months), decompose"information update vs. style drift"， provide dynamic feedback.
- Future-3 (Cross-Industry Transferability).

13.Thesis timeline



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Thank you