

An Impact Valuation Index System for Competitive Neutrality Principle

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Abstract: This paper reated a "competitive neutral" impact qualitative evaluation index system. The report is based on the eight elements of "competitive neutrality" proposed by OECD, combined with the competitive neutrality framework proposed by various research institutes, and uses the hybrid method of literature collation and data mining to re-integrate the "competitive neutrality" framework of state-owned enterprises, establish 3 levels of indicators from the perspective of enterprises, and select the quantitative criteria based on the availability of enterprise data in reality.

Keywords: Competitive Neutrality, SOEs, OECD

1. Introduction

In addition to the needs of the development and reform of domestic state-owned enterprises, the international practice of "competition neutrality" has also become more and more abundant^[1]. The principle of "competition neutrality" has become an important chapter of the important international multilateral (regional) economic and trade agreements such as the Comprehensive and Progressive Trans-Pacific Partnership Agreement, the United States, Canada and Mexico Trade Agreement, and the European Union Operation Treaty^[2]. Whether it is the reform of domestic state-owned enterprises or the formulation of international economic and trade rules, the value of the "competitive neutrality" system is increasingly accepted by more and more policy makers, but at the same time, some countries use "competitive neutrality" as a tool to restrict other countries from participating in the international market^{[3][4][5]}. Therefore, it is an extremely important research topic to explore the impact of the principle of "competition neutrality" on Chinese enterprises by combining qualitative and quantitative methods. We build a competitive neutral impact evaluation index system to understand the main impact of this principle

2. Indicator construction principles

The construction of any indicator system needs to refer to certain principles. In addition to combining the general principles for the selection of the evaluation indicator system, the characteristics of the evaluated object should also be considered. The specific principles are summarized as follows:

- (1) **Comprehensiveness.** The evaluation index constructed should cover all aspects of measuring the development status of state-owned enterprises to accurately reflect the impact of the competitive neutrality system on state-owned enterprises.
- (2) **Feasibility.** The constructed indicators should be practical and feasible, the selected indicators should be fair, comparable and accessible, and the data sources should be true and reliable.
- (3) **Independence.** The constructed indicators should be independent of each other, and the correlation between indicators should be as low as possible to prevent information duplication and reduce the complexity of evaluation calculation.
- (4) **Purpose.** The purpose of the construction of evaluation indicators should be clear. All indicators should closely focus on the theme of "competitive neutrality" impact evaluation on state-owned enterprises, and select the most relevant indicators according to the evaluation purpose to ensure the diversity and representativeness of the evaluation indicators.
- (5) **Hierarchy.** The impact of the "competitive neutrality" system on state-owned enterprises involves a wide range of complex contents. It is necessary to establish hierarchical evaluation indicators to facilitate analysis and calculation, and to clearly reflect the internal relationship between indicators.

3. Indicator construction process

3.1 Level 1 indicators

The Organization for Economic Co-operation and Development (OECD), as the first international organization to study the principle of "competition neutrality", issued the "competition neutrality: maintaining an environment of fair competition between state-owned and private enterprises" in 2012, which summarized the "competition neutrality" policy into eight elements: rationalization of state-owned enterprise organizations, cost recognition, commercial return, public service obligations, tax neutrality Regulatory neutrality, debt neutrality and subsidy constraints, government procurement^[6]. Since the OECD version of the "competitive neutrality" evaluation framework was put forward earlier, with the global situation and economic development, this framework can not be fully applicable to the current evaluation of the impact of "competitive neutrality" on state-owned enterprises, especially state-owned enterprises in China, so this topic is shown in by consulting the relevant information released by the Institute of Economic System and Management of the National Development and Reform Commission and other research institutions in recent years, Summarize and sort out the focus of the "competitive neutrality" evaluation framework proposed by various research institutes, and combine the OECD version of the "competitive neutrality" evaluation framework to summarize and refine the level 1 evaluation indicators applicable to the analysis of the impact of "competitive neutrality" on state-owned enterprises^{[7][8]}. Details are in Table 1.

Table 1: Focus of the competitive neutrality evaluation framework of research institutes

Institute	Indicators
Institute of Marxism, CASS	Realize the reform of mixed ownership and management system
China Institute of Industrial Economics, CUET	Corporate transformation, classified reform of state-owned enterprises, reform of state-owned capital operation system, and reform of mixed ownership
Institute of Economic System and Management, NDRC	Governance structure, regulatory neutrality, institutional reform
Joint Research Center of International Economic and Trade Governance and China's Reform and Opening up	Business classification management, operation transparency, government supervision
Institute of International Law, WHU	Classified reform, enterprise system, mixed ownership reform, regional cooperation, international investment
IIE, CASS	Transparency, regulatory neutrality
CPTPP	Cross-border service trade, regulatory consistency, transparency, government procurement

To sum up, this paper will establish an evaluation index system of the impact of "competition neutrality" on state-owned enterprises from six aspects: governance structure, management system, business layout, supervision, transparency and internationalization. Delete the indicators related to the government, and re-classify the relevant evaluation contents of "competitive neutrality" mentioned by OECD according to the above six aspects, so as to obtain the relevant "competitive neutrality" Level 2 evaluation indicators of the selected OECD version. Details are in Table 2.

Table 2: OECD competitive neutrality evaluation framework after preliminary screening

Level 1 indicators	Level 2 indicators
Governance structure	Organizational structure, corporatization
Management system	Performance assessment, cost management
Business layout	ROI
Regulated	Regulatory policies, regulatory standards
Transparency	Information disclosure, system transparency
Internationalization	Cross-border transaction

3.2 Level 2 indicators

After deleting the indicators from the perspective of the government, the indicators related to the perspective of state-owned enterprises in the original OECD competitive neutral framework are not perfect, so the method of data mining is used to supplement the level 2 indicators of the "competitive neutral" framework. The process of data mining is as follows: in the data preprocessing stage, the Jieba model is used to segment the text; LDA and TF-IDF models are selected to mine text keywords to establish the level 2 indicators of data mining.

The reorganized OECD competitive neutral framework and data mining level 2 indicators are comprehensively considered to determine the level 2 indicators.

(1) TF-IDF operation results

According to the relevant literature collected and sorted out, this section selects the TF-IDF method to conduct data mining on the six aspects of corporate governance structure, management system, supervision, transparency, internationalization and business layout^{[9][10]}. After running the TF-IDF model, we can get the TF-IDF value of the words in the text. When a word is more frequent and less common in the document, it means that the word can reflect the text content well. Therefore, we adopt this method to determine the indicators used to analyze the corporate governance structure, management system, supervision, transparency, internationalization and business layout. According to the operation results of the TF-IDF model, the keywords with the highest weight that can be intuitively used for the relevant analysis of "competitive neutrality" are selected from the keyword groups of governance structure, management system, supervision, transparency, internationalization and business layout. Details are in Table 3.

Table 3: TF-IDF keywords distribution

Governance structure		Management system		Transparency	
Indicators	Weight	Indicators	Weight	Indicators	Weight
Board of Directors	0.156681	Management	0.208474	Transparency	0.331113
Shareholder	0.109388	System	0.137688	Information	0.248264
Mechanism	0.103976	Culture	0.105635	Disclosure	0.146944
Information	0.082759	Employee	0.0821981	Timeliness	0.121531
Ownership	0.082011	Process	0.063166	Integrity	0.089436
Structure					
Disclosure	0.081130	Work	0.058944	Willingness	0.058091
Manager	0.076307	Capability	0.051222	Accuracy	0.057774
Stakeholder	0.075409	Data	0.048283	Authenticity	0.051541
Board of Supervisors	0.064206	Function	0.045167	Analyst	0.049982
Management	0.064129	Systems	0.039251	Profit	0.045755
Business layout		Regulation		Internationalization	
Indicators	Weight	Indicators	Weight	Indicators	Weight
Business	0.137649	Contribution	0.161346	Investment	0.107938
Assemble	0.068546	Right	0.145278	Overseas	0.102390
Kind	0.068096	Cost	0.100169	Strategy	0.082727
Industry	0.067592	Asset	0.085517	Business	0.057189
Layout				Process	
Industry	0.066456	Performance	0.082029	Finance	0.047351
		Access			
Scope	0.059959	Debt	0.068866	Organization	0.045945
Space	0.055455	Security	0.046086	Performance	0.042894
Layout	0.044579	Social Effect	0.043753	Overseas	0.036958

Area	0.043646	Efficiency	0.042259	Management	0.031339
				Financial	
Development	0.040134	Social	0.036869	Management	0.030549
		Responsibility		Marketing	

(2) LDA operation results

According to the relevant documents of enterprises in six aspects of governance structure, management system, supervision, transparency, internationalization and business layout, the LDA subject model technology is selected for relevant index mining^{[11][12]}. After the LDA topic model is run, the probability of each word in the topic is obtained, and the word with higher probability in each topic has a positive mutual mapping relationship with the subject. Extract the practice index results of each aspect according to the running results of the LDA subject model. Details are in Table 4.

Table 4: LDA keywords distribution

Aspect	Subject word distribution (ten keywords in all aspects)
Governance structure	Board of directors, Board of Supervisors, management, management, equity structure, investors, shareholders' meeting, committee, stakeholders, CIRC
Management system	Code of conduct, values, satisfaction, performance assessment, values, management control, data management, management system, managers, indicator system
Business layout	Spatial layout, layout adjustment, industrial layout, resource allocation, main business, industrial chain, market share, distribution, industrial structure and geographical location
Regulation	GDP, property rights protection, operating income, current assets, financial status, performance evaluation, transparency, cost, asset-liability ratio, contribution
Transparency	Relevance, reliability, timeliness, authenticity, accuracy, integrity, voluntariness, importance, Shenzhen Stock Exchange, diversification
Internationalization	Financial management, internal structure, business process, strategy, economic benefits, overseas operation, sales, internal structure, marketing, development and investment

After comprehensive consideration of the reorganized OECD framework and the level 2 indicators obtained through data mining, a new indicator system was initially established. Details are in Table 5.

Table 5: Renewed OECD competitive neutrality evaluation framework

Level 1 indicators	Level 2 indicators
Governance structure	Organizational structure, corporatization
Management system	Performance assessment, cost management
Business layout	ROI, spatial layout, business scale
Regulation	Governmental regulation, social regulation
Transparency	Information transparency, system transparency, operation transparency, process transparency

Internationalization Internationalization will, internationalization capability,
internationalization performance

3.3 Level 3 indicators

According to the level 2 indicators established in the six major aspects of governance structure, management system, business layout, supervision, transparency and internationalization, the relevant literature has been consulted and the corresponding tertiary indicators have been established. Details are in Table 6.

Table 6: Evaluation framework with 3 levels

Level 1 indicators	Level 2 indicators	Level 3 indicators	
Governance structure	Organizational structure	-	
	Corporatization	-	
Management system	Performance assessment	Competitive recruitment mechanism Employee training	
	Cost management	Public welfare cost Commercial cost	
Business layout	ROI	-	
	Ppatial layout	-	
	Business scale	-	
Regulation	Governmental regulation	-	
	Social regulation	-	
Transparency	Information transparency	Convenience Openness Timeliness Accuracy	
		System transparency	-
		Operation transparency	-
		Process transparency	-
	Internationalization	Internationalization will	-
		Internationalization capability	Technical resources Operation
		Internationalization performance	-

4. Conclusion

This paper uses TF-IDF, LDA thematic model and literature research methods to create a "competitive neutral" impact qualitative evaluation index system. The report is based on the eight elements of "competitive neutrality" proposed by OECD, combined with the competitive neutrality framework proposed by various research institutes, and uses the hybrid method of literature collation and data mining to re-integrate the "competitive neutrality" framework of state-owned enterprises, establish the level 1, level 2 and level 3 indicators from the perspective of enterprises, and select the quantitative criteria based on the availability of enterprise data in reality.

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