



Research on the Statistical Accounting Method of Fixed Assets Investment

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Abstract. The statistical data of fixed assets investment is an important basis of national economic accounting and an important indicator of social and economic development. This paper comprehensively expounds the development of statistical accounting methods for fixed assets investment in China, studies the differences between financial expenditure method and image progress method from four dimensions: filling basis, measurement benchmark, statistical start and end points, and investment statistical range, and carries out calculation and analysis of investment completion under the two algorithms.

Keywords: Statistical accounting method of fixed assets investment, image progress method, financial expenditure method

1 Introduction

Fixed asset investment statistics is an important part of the company's investment management work, connecting investment planning with investment execution analysis and serving as an important link in the investment management process. In the current context of deepening the reform of transmission and distribution pricing, accurate statistics of fixed asset investment completion is of great importance for solidifying the pricing basis of transmission and distribution pricing. Therefore, it is particularly important to study the difference between the image progress method and the financial expenditure method, do a good job in the transformation of investment statistical accounting methods, actively respond to the reform of accounting methods, and strengthen the statistical work of fixed asset investment.

2 Development of Statistical Accounting Methods for Fixed Assets Investment in China

The fixed assets investment statistical system was established in the early 1950s^[1]. As an important part of national statistics, it has gone through a development process from scratch to maturity, the theoretical basis and calculation principles of investment statistics have been continuously optimized and adjusted, and the investment statistical system and methods have become more scientific and reasonable.

2.1 Image Progress Method Stage

In the early years of new China, along with the highly unified planned economic system, the fixed assets investment statistical system was officially established drawing on the statistical model of former Soviet Union. The fixed assets investment is calculated using the "image progress method", that is, based on the image progress of the project, the completion of fixed assets investment is calculated by multiplying the completion progress of the physical workload by the estimated unit price, and the completion progress of the physical workload consists of each sub project.

In practical applications, the image progress method not only calculates the image progress of the project, but also the corresponding investment completion. When collecting data, the project progress is generally assessed by estimation, which is highly arbitrary and cannot be traced for verification, resulting in poor accuracy of investment statistics^[2]. At the same time, phenomenon has gradually occurred that some local governments have embellished their political achievements by falsely increasing fixed assets investment^[3], due to the difficulty of data verification. The hidden problem of statistical data quality caused by relying on the image progress method of manual estimation has gradually emerged.

2.2 Dual-Track Parallel Stages of Image Progress Method and Financial Expenditure Method

With the continuous development of China's market economy system, improvement of laws and regulations such as the Company Law, Accounting Law, Audit Law, and Enterprise Accounting Standards, enterprise financial statements have been improved constantly in data quality as a credible data audited by the third party, laying a foundation for the trial of the "financial expenditure method". In order to meet the needs of social development and objectively reflect the actual economic operation trend, the National Bureau of Statistics gradually explored the transformation from the "image progress method" to the "financial expenditure method", and in June 2013, piloted financial expenditure methods in Shanxi, Jiangsu, Guizhou, and Shaanxi. After 2015, the scope of investment reform pilot expanded to the whole country^[4].

Under the current accounting standards, "financial expenditure method" is based on the financial statements, accounting for the cost (value) corresponding to the workload

of construction and purchase of fixed assets with a certain period, and reflects the completed investment in fixed assets by the amount under accounting items such as "construction in progress"^[5]. The financial expenditure method is based on the premise of accounting, and only fixed asset investment projects that have passed accounting can be included in the fixed asset investment statistics. In practice, according to the financial system of different investment entities, the indicators are all taken from the current financial system in the accounting of the first or second level of the subject, the meaning of the indicators is clear and unified, there is no ambiguity, the survey enterprises directly report data in China's investment information management and monitoring system, omitting the intermediate links of layer by layer reporting, reducing the possible intervention of local statistical departments at all levels, reducing the subjective component, and improving the authenticity of the data. At the same time, due to its accounting-based characteristics, the financial expenditure method reduces the tendency of local governments to overstate data for the needs of performance appraisal, and has better verifiability, which helps to improve the accuracy and reliability of statistical data.

However, due to reasons such as construction side's deposit, credit sales of materials and equipment, and delayed settlement, the confirmation time of investment completion amount using the financial expenditure method is usually later than that of the image progress method, resulting in a relatively delayed investment completion data^[6].

2.3 Financial Expenditure Method Stage

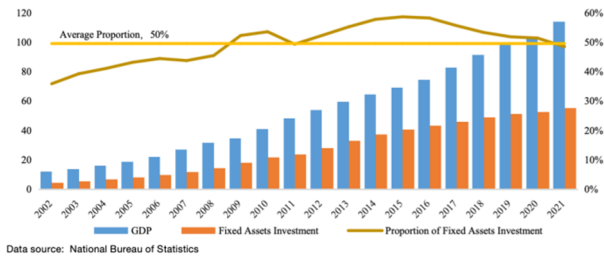


Fig. 1. GDP and fixed assets investment from 2002 to 2021.

In 2018, Central Leading Group for Inspection Work visited National Bureau of Statistics, pointing out the data quality problem that "investment statistical data are distorted and cannot objectively reflect the economic operation trend". The National Bureau of Statistics is actively rectifying and reforming, constantly exploring effective methods of returning true statistical data, financially recommending the "Financial Expenditure Method" based on vouchers and counting data as the main method of investment statistical accounting, and completed the revision of historical investment data from 2003 to 2020 in 2021. From the proportion of revised fixed assets investment in GDP over the years, fixed assets investment accounts for about 50% of GDP (see Figure 1). The proportion of investment and GDP returns to a reasonable range, and the coordination and matching with relevant macroeconomic indicators have improved significantly. In

2022, the National Bureau of Statistics issued the latest version of the fixed assets investment statistical reporting system.

3 Difference Analysis Between Financial Expenditure Method and Image Progress Method

Compared with the current "image progress method", "financial expenditure method" emphasizes more on "providing evidence, direct collection and eliminating calculation". The investment statistics of the financial expenditure method are based on financial expenditure. The investment statisticians no longer perform secondary processing on the data, but directly use the project cost data for accounting, and the actual contract price is used as the basis for pricing. The end point of investment completion submission is extended from project commissioning to project final accounts^[5]. The specific changes are as follows.

3.1 Filling Basis Difference

The financial expenditure method emphasizes more on "data with evidence" emphasizing that the investment amount should be filled in according to the standard of legal vouchers^[7]. The time point when the voucher is obtained is taken as the measurement time point, and clearly stipulates the requirements for filling in the four expenses of fixed asset investment. The filling basis of financial expenditure method is mainly divided into three categories: accounting subjects, payment vouchers, and project settlement sheets or progress sheets. Among them, in first condition, the cost entry time is the measurement time point; second, the bank bill payment time is the measurement time point; third, only applicable to the construction and installation project, the time of the last party's signature among the signatures of the owner, supervisor and construction party is taken as the measurement time point.

The "image progress method" is used by the investment statisticians to calculate the investment completion amount by multiplying the project construction progress by the corresponding four estimated cost. Under the financial expenditure method, investment statisticians only work as "data porters" and no longer participate in data calculation. The completed amount of fixed assets investment is directly calculated according to the project entry cost or capital expenditure, taking the "construction in progress-construction installation project", "construction in progress-equipment to be installed", "construction in progress-expenditures to be amortized" of the project entry cost or the corresponding capital expenditure data.

3.2 Measurement Benchmark Difference

While the financial expenditure method takes the final contract price as the measurement benchmark, the current accounting method takes the project budgetary estimate. According to the analysis of the final balance of the completed power grid infrastructure projects, the balance rate of the project of different voltage levels is detailed in the Table

1, the maximum balance rate of 330 kV project is 23.1%, and the minimum balance rate of 750 kV project is 12.8%. According to statistics, the average balance of final accounts and budget estimates of power grid infrastructure projects is 14.2%. Therefore, the investment completion amount calculated by the financial expenditure method based on the actual contract price is smaller than based on the estimated price^[8].

Table 1. Balance distribution of power grid infrastructure projects by voltage level

Voltage Level	Balance Rate
1000kV	13.5%
750kV	12.8%
500kV	13.0%
330kV	23.1%
220kV	17.5%
110kV	17.4%
35kV	18.6%
10kV	18.3%

3.3 Statistical Difference Between Start and End Points

The current statistics on the completed investment in fixed assets start from the start of the project and end when the project is put into operation. The starting point of reporting by the financial expenditure method remains unchanged, and the end point of reporting is the completion of final accounts. Compared with the image progress method, the statistical cycle is extended.

3.4 Statistical Range Difference

Since the reporting end point of detailed project investment statistics extends to the completion time of project final accounts, the scope and structure of annual investment statistics at the unit level will change, that is, in addition to the newly started and extended projects assigned by the comprehensive plan within the existing statistical scope, it also includes carry-forward projects (projects that have been put into production but have not been settled, and the costs continue to occur).

To sum up, there are some differences between the image progress method and the financial expenditure method in terms of the filling basis, calculation method, measurement benchmark, starting and ending points of statistics, and the scope of investment statistics.

4 Trial Calculation of Investment Completion Based on Financial Expenditure Method

Based on the requirements of the latest algorithm of the 2023 version of the National Bureau of Statistics, in accordance with the financial expenditure method, the fixed

asset investment is accounted for by the project cost. Taking the power grid infrastructure projects under construction and carry-over in 2022 in Province Z as the object, and based on the data of investment completion and project cost (including tax, the same below) in 2022, analyzes the impact of the change of fixed asset investment statistical accounting method to the financial expenditure method on the completion of the company's annual investment plan and the completion rate of the plan.

4.1 Calculation of Annual Investment Completion

In 2022, the company's power grid infrastructure project has been invested 8.4 billion yuan this year (image progress method), and the project cost this year is 8.1 billion yuan (financial expenditure method). Among them, the investment completion of new and continued projects accounted for 35% and 65% respectively, and the engineering costs of new, continued and carried forward projects accounted for 31%, 67% and 2% respectively (see Figure 2).

From the list of investment completed projects in 2022 this year (newly started and continued projects), the corresponding cost was recorded at 7.9 billion yuan, and the cost was 500 million yuan lower than the investment completed (caused by changes in the pricing benchmark). The cost of the carry-forward projects was accounted for 200 million yuan, which was included in the scope of investment statistics, resulting in the investment completion measured by the financial expenditure method being 300 million yuan lower than the investment completion measured by the image progress method, and the overall scale difference between the two was reduced.

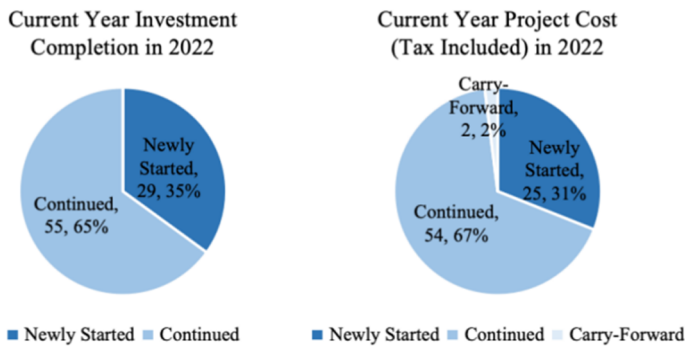


Fig. 2. 2022 Current year investment completion and project cost structure.

3.1.1 Analysis by Voltage Level.

The main network newly started, continued construction project investment accounted for 37%, 63%, respectively, the new start, continued construction, carry-over project cost accounted for 23%, 70%, 7%; The proportion of newly started and extended project investment completion of distribution network is 78% and 22% respectively, and the proportion of newly started, extended and carried forward project engineering costs is 77%, 23% and 0.3% respectively (see Figure 3).

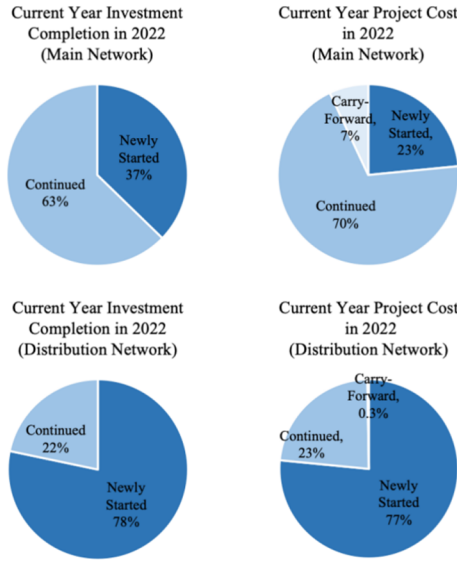


Fig. 3. 2022 Current year investment completion and project cost structure by voltage level.

From the perspective of investment completion structure, the two are completely opposite; from the perspective of project cost structure, the main network construction projects account for a relatively large proportion, and the distribution network newly started projects account for a relatively large proportion. The cost of the main network carry-over projects accounted for 7%, and the distribution network carry-over projects accounted for only 0.3%. After analysis, it was mainly due to the short construction period of the company's distribution network projects, and most of the newly started projects could be put into operation and completed the final accounts in the same year.

3.1.2 Analysis from a Monthly Point of View.

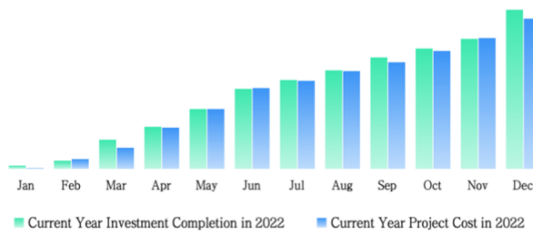


Fig. 4. 2022 Current year investment completion and project cost structure by month.

The investment completion of power grid infrastructure projects from January to March is higher than the cost of entry, and later due to the large-scale entry gap of

renewal and carryover projects, the investment completion from April to November is basically the same as the entry cost, and the investment completion in December is slightly higher than the entry cost (see Figure 4).

4.2 Calculation of Annual Plan Completion Rate

From the perspective of the 2022 plan completion rate, the plan completion rate measured according to the financial expenditure method is 94.08%, which is 5.69 percentage points lower than the plan completion rate of 99.77% measured by the image progress method (see Table 2 for details). Among them, the 500-35 kV project is faster according to the financial expenditure method, and the project of 10 kV and below is the opposite.

Table 2. Planned completion rate of grid infrastructure projects in 2022

Voltage Level	Planned completion rate by financial expenditure method	Planned completion rate by image progress method	Differences in plan completion rates
Total	94.08%	99.77%	-5.69%
500-35 kV	103.45%	98.91%	4.54%
10 kV and below	86.31%	101.73%	-15.42%

In 2022, on a monthly basis, the plan completion rate of 500-10 kV power grid infrastructure projects measured by the financial expenditure method is relatively close to the image progress method, and the growth rate of the monthly plan completion rate fluctuates greatly in the first five months and tends to be consistent in the second half of the year (see Figure 5).

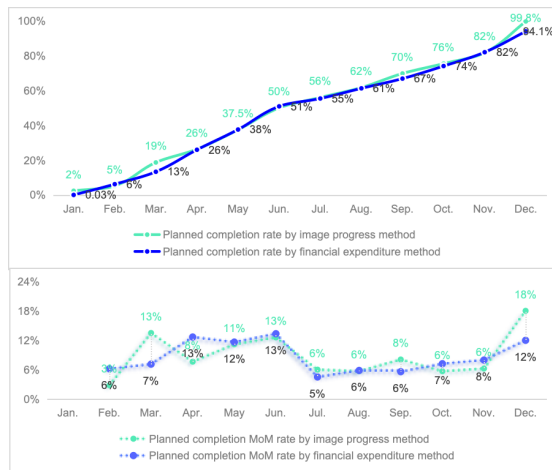


Fig. 5. The completion rate and growth rate of the monthly plan for 500-10 kV power grid infrastructure in 2022.

In terms of voltage levels, the plan completion rate of 500-35 kV projects measured according to the financial expenditure method has been higher than that of the plan completion rate according to the image progress method since April, and the growth rate of the monthly plan completion rate has also tended to be stable. After analysis, it is mainly affected by the recording of continuation and carry-over projects, and the financial expenditure method is slightly higher than the image progress method (see Figure 6).



Fig. 6. The completion rate and growth rate of the monthly plan for 500-35 kV power grid infrastructure in 2022.

For projects of 10 kV and below, from the perspective of annual completion, the plan completion rate measured according to the financial expenditure method is lower than the plan completion rate measured by the image progress method, and the growth rate of the monthly plan completion rate is higher in the first half of the year and decreased in the second half of the year (see Figure 7).

In summary, from the perspective of annual investment completion, due to the difference in the measurement benchmark and statistical range, the investment completion scale calculated by the financial expenditure method is 300 million yuan lower than that calculated by the image progress method. From the perspective of investment structure, carry-over projects (accounting for only 2% of costs) have little impact after being included in the financial expenditure method, but have a greater impact on 500-35 kV main network projects (accounting for 7%), and less impact on projects of 10 kV and below (accounting for 0.3%). On a monthly basis, the progress of accounting before March was slower than the progress of investment completion, and the progress of accounting began to gradually catch up from April.

From the perspective of annual plan completion rate, the completion rate of the plan measured by the financial expenditure method is 5.69% lower than that measured by the image progress method. On a monthly basis, there is no significant difference between 10-500 kV projects. However, the completion rate of 500-35 kV projects has

been high since April according to the financial expenditure method, and the opposite is true for projects of 10 kV and above.

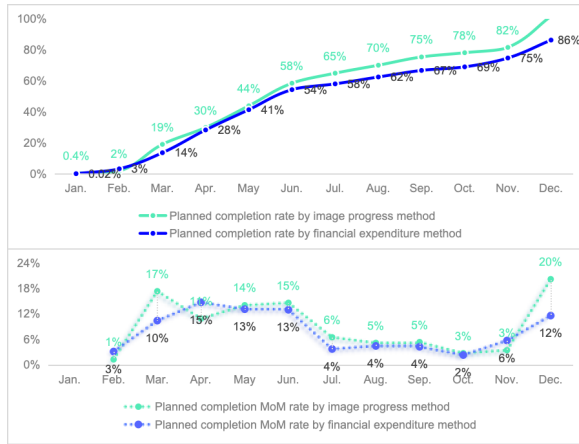


Fig. 7. The completion rate and growth rate of the monthly plan for 10 kV and below power grid infrastructure in 2022.

Therefore, the financial expenditure method has a certain impact on the existing investment statistical structure and investment implementation progress, and from the perspective of the overall investment completion scale, the financial expenditure method has little impact on the overall investment completion of the company.

5 Conclusion

Fixed asset investment is one of the key indicators reflecting the results of economic and social development. Therefore, we will implement the spirit of the 20th Central Congress, resolutely implement the requirements of the National Bureau of Statistics on fixed asset investment statistical statements, take the initiative to adapt to the changes in investment statistical accounting methods, and continue to innovate and iterate on ourselves. It is of great practical significance to keep pace with the times and constantly improve the statistical methods of corporate fixed asset investment [9].

In order to effectively support the switch of investment statistical accounting methods, safeguard measures are formulated from the aspects of management and technology. First, management guarantee. In order to smooth the transition, it is recommended to prioritize the financial expenditure method for newly started projects, that is, according to the cost of the financial expenditure method to calculate the completed investment in fixed assets; For the continued construction projects, the image progress method is still continued, and it is expected that as the continued construction projects are put into operation one after another, this part of the difference will be naturally digested within two years. Second, technical support. Relying on digital technology innovation, speed up the automatic data collection frequency of ERP and other systems

[10], and ensure that the information of the online power grid investment statistics module is synchronized with the accounting operation of the grass-roots detailed projects. Deepen data governance, improve data quality, and provide strong support for smooth algorithm switching.

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