

# Analysis of the Impact of Big Data Era on Accounting

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## Abstract

In recent years, modern technology has developed faster and faster, and the era of "big data" has emerged under this trend. It's a very significant test for accounting to accept big data. When we have been seeing this phenomenon, I got the conclusion that is the efficiency of accounting work will soon be improved with it. The paper will analyze the evaluation model of development, which is based on Shanghai. Then pay attention to the graduate employment rate of Shanghai Lixin Financial and Accounting Institute. There is no denying that the data of Shanghai Bureau of Statistics is a great supporting material for researching, constructs the model with simple econometric methods, and studies big data. The possible impact of the times on accounting, thus derived thinking about related problems, and discussed the corresponding solutions.

## Keywords

Big Data; Shanghai Lixin Institute of Finance and Accounting; Econometrics; Accounting; Impact.

## 1. Introduction

### 1.1. Research Background

Due to the expansion of computer storage capacity and the improvement of machine algorithms, the current amount of data is growing rapidly. These circumstances have driven exponential growth in technology, and business models have been affected by it. Industrial competitiveness has gradually improved, and new innovative business models have gradually formed. They have been fully applied to enterprises and achieved huge commercial value.

Big data has many uses. It not only allows people to change or even break free from old values and development concepts, but to view and understand the technological development of the world with a new look, thereby subtly affecting people's views and concepts of something. By paying attention to the application of large-scale data which about it, it can be known that through the characteristics of some data, it can be fully implemented in public transportation, others are aspects. Big data is linked with cloud computing, therefore, then many things will become possible, and this will likely lead to new economic growth points.

In my view, there is no doubt that with the rapid development of the era of big data, my country and people will meet lots of opportunities and different challenges which are amazing. In this time, accounting will be as the role of important enterprise activities, and they greatly embodied in much practical application about the country and some important enterprises. With the quickly development of the era of big data, it's normal that our country's accounting industry has been fully affected. Based on traditional accounting, Chinese accounting must make changes to enhance the functional concept of accounting and promote functional transformation, to better play its due role. In sometimes we do some things to meet the needs of the era of big data, of course, countries and enterprises real need to strengthen the training of accounting big data capabilities and improve the quality of relevant accounting of it, so with the quickly rapid development of big data, it is very greatly significant to research the ability improvement of accountants.

## 1.2. The Purpose and Significance of the Research

This paper earnestly investigates and analyzes the existing relevant materials, constructs a development benefit evaluation model, and then selects Shanghai Lixin Institute of Finance as the research object to construct a linear regression model and conduct related analysis, hoping to more truly and accurately describe the development status of my country's accounting industry. , delve into the impact of the big data era on accounting, and then analyze the related problems in the accounting industry, and at the same time put forward rational suggestions to make a contribution to the well-ordered development of the accounting industry.

This article briefly and comprehensively describes the current phenomenon of the today's accounting industry and others, then we are forced on this basis which shows future direction. At the same time, it proposes the impact of big data on the accounting industry, so that we need to make accounting try their best to help the production and operation of enterprises and others. So that healthy development of the industry and the four modernizations will be achieved. It is hoped that through the research of this paper, the accounting circle will pay attention to the relevant issues, and while enriching the existing theories, it will provide feasible suggestions for the actual implementation of accounting work, and give government a great support.

## 2. Analysis of the Current Situation

### 2.1. Development Status

Presently, because modern technology computer's development, some industries have begun to fully implement this high-quality Internet tool into enterprise operation and management, the accounting industry has actively cooperated with Internet technology in the era of rapid development of it. in order to better carry out the development plan, the country has also clearly carried out higher requirements and reform for the accounting industry. In the 1980s, China's accounting began to be affected by big data, and has made greater progress after recent years of development. However, some reforms and innovations did not appear in the accounting information system immediately, and these deficiencies have affected the healthy and stable progress and development journey of the enterprise internal accounting information system.

### 2.2. Research Status

Let's see from the current time, the performance of accounting affected by the influence of big data era is mainly reflected in the discovery or trend of accounting, and it has a great impact on traditional accounting, so we must think about how to solve these derived related problems.

#### 2.2.1. Research on the Development Status and Trend of Accounting in the Era of Big Data

Wang Longji (2014) pointed out that although "big data" appeared as a new concept, the Chinese government apparently did not issue relevant policies to support it. Four key technological innovation projects, including a large number of data storage, analysis and related data mining, etc., constitute "big data".

Zheng Shunmin (2014) mentioned that the current economic development of globalization, accounting data has rapidly entered the era of big data, mainly due to financialization and informatization. Although traditional accounting methods are also very effective and useful, they are still slightly deficient in data processing, not to mention cost reduction, so it is difficult to solve the accounting problems in the era of big data. However, the emergence of cloud computing has provided the necessary technical support for the solution of accounting problems, and it has also become accounting cloud computing through and integrated with accounting. It can be seen that cloud computing brings opportunities and methods to

accounting processing in the era of big data, so enterprises should correctly view the integration of accounting and cloud computing.

Shi Kaixin and Li Changfu (2014) pointed out that the now the development process of network accounting can be said to be in the initial completion stage, and there are still some problems to be solved. However, it is gratifying that the development of The Times did not let it sink, but let it receive further attention and various applications. In their opinion, there is a certain trend that network accounting will be extended to the effective use of the function of network accounting, to realize the development of "management integration" and other directions.

### 2.2.2. Impact on Traditional Accounting

Wen Yimo (2012) pointed out that the advent of cloud computing will have a huge impact on the traditional accounting model, so that the accounting data system will undergo earth-shaking changes, and economic practices will be synchronized with financial management, and financial shared services will be easy to implement.

Xing Hao (2010) pointed out that the previous financial accounting theories are based on a series of assumptions, but with the formation of the new social and economic environment, there are four assumptions about the existence of accounting with many difficulties to be solved, which will gradually affect the realization of the relevant rights of accounting and the implementation of various systems. Impact on the historical cost pricing principle.

Guo Lihong (2014) pointed out that the introduction and emergence of network accounting has resulted in fundamental changes in accounting theoretical research and practice and improved accounting efficiency.

### 2.2.3. The Dilemma and Coping Strategies of Accounting Reform in the Era of Big Data

Fan Yanping and Cao Wei (2014) pointed out that in such a predicament, and he believes that the best way is to strengthen and apply the construction of cloud computing platform, and actively participate in the related services of cloud computing and establish a risk assessment mechanism under cloud accounting.

Sun Yumeng and Tian Yuqing (2014) pointed out that accounting in the era of big data will encounter difficulties such as slow computer hardware, imperfect network construction, wrong implementation of software tools, and low quality of accountants. In this case, we need to reduce manual bookkeeping and frequently update computer systems; and complete network construction is a perfect tool to speed up software products, and at the same time, we also need to work on improving the quality of corporate financial personnel in an all-round way.

## 3. Establishment and Analysis of Related Models

### 3.1. Comprehensive Evaluation Model of Development Benefit

**Table 1.** The four regions

Area	Infrastructure investment rate	Talent output rate	Comprehensive energy consumption	Material consumption	Ratio of technological transformation to fixed asset investment
Hangzhou	29.09	1.94	4.55	67.40	67.60
Shanghai	36.97	2.60	2.43	67.90	54.55
Guangzhou	29.13	1.97	3.60	68.70	64.00
Nanjing	23.92	1.17	7.92	58.10	55.20

Table 1 below shows the statistics of the six science and technology development indicators in the four regions of Hangzhou, Shanghai, Guangzhou and Nanjing.

Based on the data in the table above, a comprehensive evaluation model is established to evaluate the above four regions as follows.

### 3.1.1. Properties of the Unified Evaluation Index Matrix

In order to facilitate comprehensive evaluation, first, the indicators should be unified and dimensionless. Among the six economic indicators listed in the table, comprehensive energy consumption and material consumption are cost-type indicators, and the others are benefit-type indicators. Therefore, a comprehensive evaluation data matrix is established according to the table, and the formula is used.

$$b_{ij} = \begin{cases} a_{ij} / \max_j a_{ij} & j = 1, 2, 3, 6 \\ \min_j a_{ij} / a_{ij} & j = 4, 5 \end{cases} \quad (i = 1, 2, 3, 4)$$

Convert the above formula into a benefit matrix.

$$B = \begin{pmatrix} 0.3962 & 0.5368 & 0.5385 & 0.6138 & 0.1226 & 1 \\ 1 & 0.3676 & 1 & 1 & 0.0755 & 0 \\ 0.3992 & 0 & 0.5594 & 0.7869 & 0 & 0.7241 \\ 0 & 1 & 0 & 0 & 1 & 0.0498 \end{pmatrix}$$

### 3.1.2. Establish an Objective Weight Vector

Use the coefficient of variation method to determine the index weights, and calculate the mean and standard deviation of each column vector of matrix B.

$$\mu_j = \frac{1}{4} \sum_{i=1}^4 b_{ij}, s_{ij} = \sqrt{\frac{\sum_{i=1}^4 (b_{ij} - \mu_j)^2}{6}} \quad (j = 1, 2, 3, 4, 5, 6)$$

Calculate the coefficient of variation.

By comparing the size of the weights, it can be explained how much the infrastructure investment rate, the profit rate of the industry chain, the talent output rate, the comprehensive energy consumption, the material consumption, and the ratio of technological transformation to the investment in fixed assets play a role in the comprehensive development benefit. From the above results, it can be seen that comprehensive energy consumption plays the largest role, followed by talent output rate, infrastructure investment rate, industrial chain profit rate, the ratio of technological transformation to fixed asset investment, and material consumption.

### 3.1.3. Calculate the Comprehensive Evaluation Score

Calculate the product of the matrix B and the objectivity weight vector w to get the scores for the four cities.

$$H = [0.7165, 0.9590, 0.7529, 0.5453]$$

Because the establishment is a benefit-based matrix, the higher the score, the better the benefit. Therefore, the advantages and disadvantages of the economic benefits of the four regions are: Shanghai, Guangzhou, Hangzhou, and Nanjing.

Therefore, select the area with the best scientific and technological development benefits (which can reflect the development of big data)—Shanghai, as the research object for the

following analysis. Since the mainstream major of Shanghai Lixin Institute of Finance is accounting, the employment rate of its graduates is taken as the quantitative data that accounting is affected by the era of big data.

### 3.2. Simple Econometric Model

#### 3.2.1. Preset Models

Let the employment rate  $Y$  (%) of Shanghai Lixin Institute of Finance graduates be the explained variable, the city equivalent of research and experimental development personnel  $X_1$  (10,000 years), the internal expenditure of research and experimental development funds  $X_2$  (100 million yuan), the research and experimental development are equivalent The regression model was established based on the proportion of Shanghai's GDP  $X_3$  (%), the local fiscal expenditure on science and technology  $X_4$  (100 million yuan), and the proportion of science and technology expenditure in local fiscal expenditure  $X_5$  (%).

#### 3.2.2. Data Collection

Some of the following data are obtained from the statistical yearbook in Shanghai and the official website of Shanghai Lixin Accounting and Finance Institute, and the data are very authoritative.

**Table 2.** Indicators related to big data development in Shanghai from 2010 to 2019

Years	City-wide equivalent of research and experimental development personnel (10,000-years)	Internal expenditure of research and experimental development funds (100 million yuan)	Research and experimental development are equivalent to the proportion of Shanghai's GDP (%)	Expenditure of local financial science and technology funds (100 million yuan)	Proportion of science and technology expenditure in local fiscal expenditure (%)	Employment rate of graduates of Shanghai Lixin Institute of Finance
2010	13.50	481.70	2.69	202.03	6.1	88
2011	14.85	597.71	2.99	218.50	5.6	88.5
2012	15.34	679.46	3.19	245.43	5.9	88.8
2013	16.58	776.78	3.35	257.66	5.7	89
2014	16.82	861.95	3.41	262.29	5.3	90
2015	17.18	936.14	3.48	271.85	4.4	90.5
2016	18.39	1 049.32	3.51	341.71	4.9	90.75
2017	18.35	1 205.21	3.66	389.90	5.2	92.61
2018	18.81	1 359.20	3.77	426.37	5.1	92.9
2019	19.86	1 524.55	4.00	389.54	8.6	93.66

#### 3.2.3. Preset Models

By analyzing the correlation between the different variables, we can clearly understand it and the explanatory variable Shanghai Lixin Institute of Finance graduate employment rate  $Y$  (%) and the explanatory variable The city equivalent of research and experimental development personnel  $X_1$  (ten thousand person-years), the internal research and experimental development funds Expenditure  $X_2$  (100 million yuan), research and experimental development is equivalent to the proportion of Shanghai's GDP  $X_3$  (%), and local financial science and technology expenditure  $X_4$  (100 million yuan), so the regression model is set as.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

OLS regression analysis with EViews.

$$Y=86.38824+0.10685X_1+0.00556X_2-1.32257X_3+0.0052X_4$$

$$(27.3530) \quad (0.2613) \quad (2.6828) \quad (-0.7841) \quad (1.2535)$$

$$R^2=0.9866 \quad R^2=0.9760 \quad F=92.5312 \quad D.W.=2.4967$$

### 3.2.4. Model Checking

The correlation matrix is obtained, and it is found that the model has multicollinearity. The model is then revised using stepwise regression.

Regressing Y and X<sub>1</sub>, x<sub>2</sub>, x<sub>3</sub>, and x<sub>4</sub> respectively, it can be seen that adding other variables will not cause the coefficient sign to be inconsistent with the economic meaning, so the final revised regression model remains unchanged.

### 3.2.5. Finalization of the Model

$$Y=86.38824+0.10685X_1+0.00556X_2-1.32257X_3+0.0052X_4$$

### 3.2.6. Summary

From the above econometric model testing process, From the above data and analysis, it is not rare for us to understand, that is, the proportion of science and technology expenditure on the employment rate of graduates of related majors is very small. It is the proportion of research and trial development that really affects employment, but few other factors.

## 4. The Impact of the Era of Big Data on Accounting

We will think about the profound impact of big data on our accounting major from the previous models.

### 4.1. Beneficial Influence

#### 4.1.1. Improve the Accuracy of Information

Big data, as the name implies, has a huge database to store information, and it can also classify and process the collected information data, and use some operations to perform operational analysis on certain data. For example, using analytical processing accounting, we can use computers to quickly calculate the true financial position of a company for a certain period. Because it will reduce or even avoid manual calculation errors and reduce the work of the accounting department. In addition, the financial statement data of different periods can be processed through big data, so that the organic summary and comparison can be achieved, and the development trend of the enterprise's financial affairs and related financial status can be calculated. Using big data, we can clearly see the annual data changes, which can be compared vertically. The traditional manual accounting is manual calculation, and the calculation cycle is relatively short. Trends in the previous decade or even decades are more difficult to calculate, and there is no guarantee that the accuracy is true. Therefore, statistical analysis of big data can summarize, compare, analyze, and study long-term data to draw conclusions, and it can also ensure accuracy.

#### 4.1.2. Improve the Efficiency of Accounting Work

In the past, accounting will make more efforts in the data at work, but the efficiency is low. However, due to the advent of the era of big data, part of the calculation work has been replaced by computers, which greatly saves the working time of accountants and makes their work more efficient. Work efficiency has been significantly improved. The previous manual accounting may take the staff more than a month or much time, more importantly, the relevant work report must be completed before the Chinese New Year. However, the time required to apply accounting informatization on it will be greatly reduced. And the time saved can be used for other work. In addition, gradually, the traditional accounting work gradually from the

accounting treatment like analysis and management transfer, the result is to improve the accounting management ability, of course, as well as accounting analysis ability. For the company, foreign investment is increasing and marketing is on track. In addition, the company can obtain more detailed market analysis and more comprehensive strategic planning.

## **4.2. Adverse Effects**

### **4.2.1. Lack of Professional and Technical Personnel**

Big data technology is a technical activity, so it is inseparable from more professional technicians. First, accountants proficient in computer technology are rare in China. Secondly, the progress of accountants is limited by the thinking of traditional Chinese accounting, and there are often disadvantages of attaching importance to financial accounting and ignoring management accounting. As a result, problems such as unreasonable age distribution structure appear among accountants in our country. The older, more educated mindset makes them less skilled in computer skills that are hard to improve. Therefore, we must focus on the training and improvement of the skills of accountants, and innovate and improve the previous accounting thinking, to actively face in order to accept the era of big data accounting industry of all kinds of accidents.

### **4.2.2. The Technology and System of Big Data are not Perfect**

In my opinion, big data technology is a technology that integrates advanced innovation and reform, in recent years, in the enterprise management, it has played an increasingly important role in accounting, and its status has been promoted step by step. As is known to all, big data has also begun to be fully applied to Chinese enterprises for many reasons, but one of the most important is the support of computers, so if the computer hardware is not powerful or the network delay, it is difficult to make such a good contribution in Chinese enterprises. On the other hand, the problems of accountants in enterprises at work will appear at various stages in the era of big data, the regulation of business is one of the more important points. Our supervision needs to improve the national system, formulate relevant laws and regulations and abide by them. In the long run, we also need to develop strategies for self-protection to effectively ensure the full play of the accounting function. Therefore, the state should strengthen and upgrade the infrastructure construction of relevant departments, and establish relevant accounting systems to standardize the system.

## **5. Issues Related to the Impact on Accounting in the Era of Big Data**

### **5.1. Disclosure of Accounting Information**

First, accounting information disclosure has problems in the work of not analyzing the reasons and the applicability of high-value information, and sometimes it is only a display of changes; second, accounting information disclosure has not been fully explored and used to reflect the existence of hidden indicators, and its role only exists. Because only explicit indicators can be disclosed; again, because bad information is deliberately discarded, it may cause unpredictable consequences. Finally, it is difficult to implement strategic adjustments in advance, and some potential problems cannot be foreseen, and information cannot be truly reported to the users of the information. It will also lead to accounting practitioners not being able to truly understand the If company has bad management and operation, it will cannot make decisions in this case.

### **5.2. The Issue of Capital Budget Management**

Based on a comprehensive budget data system based on big data, enterprises can use professional capabilities to build a financial data system, business data system and external data system into a whole, and layout the control of budget, something which is about

assessment and adjustment of the enterprise. For ensuing the timely and smooth implementation of lots of strategic plans of the enterprise to be done through corresponding accounting analysis and processing methods, and must be completed with the help of this system.

### **5.3. The Problem of Low Quality and Ability of Enterprise Accountants**

In the accounting industry, our country also needs daily innovation, especially in the professional ethics of accounting practitioners. Professional ethics is the most important job security for accounting personnel. Secondly, professional ability is also the most important capital for accounting personnel to keep their jobs: 1. Some accountants have no professional ability and can only rely on the old traditional accounting knowledge that has not been updated, they cannot actively learn new accounting knowledge in time; 2. Some accountants in the enterprise cannot predict the exact needs of important economic development in time, and can't they greatly adapt to the new environmental. and only do some extremely ordinary accounting 3. Some accountants cannot correctly view the emergence of interests, cannot stand the temptation, are easily affected by external factors, and even lack moral and legal concepts, and do some behaviors that violate professional ethics and even professional regulations.

## **6. Countermeasures for Related Problems in the Era of Big Data**

### **6.1. Establish a Correct Concept of Big Data Assets**

While supporting big data assets, it should be able to rationally predict the behavior of users, and correctly identify the current situation and corresponding development potential of an enterprise and even the market. Enterprises should fully grasp the diverse needs of customers, and want to keep up with the development of enterprises. We need to conduct in-depth and accurate analysis, and need to master the concept and knowledge of data assets.

### **6.2. Strengthening the Construction of Information Security**

Enterprises should strengthen the establishment of a more secure information network system, actively include server maintenance personnel, and increase the number of receiving senior computer personnel. It is necessary to improve the security of the enterprise information network, and often fix regular bugs, to discover the existing problems and solve them in time. In addition, through various cloud accounting service providers, we can also jointly develop accounting information systems with higher security assurance. In addition, I think the Chinese government must pass legislation to strengthen the protection of network information security, or actively establish more complete punishment regulations for network information security, which can strictly control all aspects of information security.

### **6.3. Cultivate All-round Accounting Talents**

High-quality and professional talents are needed by any job and position. As an accountant, which need more needs. In recent years, because of big data, the demand for general accounting talents in the accounting field can be said to be increasing, In the previous accounting model, the value of accountants was limited to the level of data inspection and supervision, and the work was repetitive, making it difficult to adapt to the accounting requirements of the big data era in a short period of time. Therefore, every enterprise must improve the training of accounting talents, let them learn advanced accounting concepts and technologies in the era of big data, continuously learn new accounting knowledge, make their working ability and computer level better and better. In their views, this is very important, they must make full use of their time to learn to increase various financial knowledge, and work hard for the aims of individuals and enterprises.

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