Research on Pre-borrowing Invoices in Universities under Accounting Informatization

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Abstract: In the context of the reform of the government accounting system, the basis of accounting of colleges and universities has transformed from the original single "cash basis" to the dual basic model that includes the "cash basis' and "accrual basis". This change undoubtedly brings new challenges to the financial management of colleges and universities. The pre-borrowing invoice business exists in universities, and with the development of accounting informatization, how to effectively manage and prevent the risks of pre-borrowing invoices has become an urgent problem. Combined with the actual work situation, this paper deeply analyzes the risk points of the pre-borrowing invoice business, and puts forward corresponding preventive measures from the two dimensions of pre-borrowing invoice management and accounting based on the background of information technology.

Keywords: accounting informatization; pre-borrowing invoices; risk; prevention;

Introduction
With the implementation of the new government accounting system in 2019, the financial management of administrative institutions in China has undergone significant changes. This system unifies the accounting system of administrative institutions such as hospitals, universities, and primary and secondary schools, shifting from a single-system accounting system based on the "cash basis" in the past to a dual system accounting system parallel to the "cash basis" and "accrual basis".

The cash basis is the cash received or paid as the basis for the recognition of revenue and expenses. Any cash received or paid in the current period, whether or not it should be attributed to the current period, is treated as income and expense in the current period; Conversely, any cash not received or paid in the current period is not treated as income and expense in the current period, even if it should be attributed to income and expense in the current period.

The accrual basis is based on the occurrence or non-occurrence of rights or responsibilities to recognize accounting elements such as revenue and expenses. Specifically, under the accrual basis, all income for the current period is treated as income for the current period, regardless of whether the payment is received or not; Income not in the current period, even if received in the current period, is not regarded as current income. All expenses incurred in the current period are treated as expenses for the current period, whether or not they are incurred; Expenses that are not incurred in the current period cannot be counted as expenses in the current period even if they have already been incurred in the current period. Under the accrual basis, the receipt and payment of payments cannot be used as a basis for the recognition of revenue and expenses. The use of the accrual basis can accurately reflect the income achieved in each accounting period and the expenses to be borne for the realization of income, so that the income of each period can be matched with its related expenses and costs, compared, and the profit and loss of each period can be correctly determined.

This transformation not only puts forward new requirements for financial management in universities, but also gives rise to new challenges in managing pre-borrowing invoices. Under the new system, the accounting of pre-borrowing invoices by universities needs to follow the principle of "accrual accounting". This means that when recognizing revenue, it is necessary to consider the progress of contract execution and whether the conditions for revenue recognition are met, rather than just based on the actual funds received. For the behavior of pre-borrowing invoices, under the new system, accounting treatment cannot be omitted due to the lack of capital inflow. It is necessary to include the invoice amount in "accounts receivable" and write it off after the actual payment is received.

With the continuous expansion of service functions in universities and the diversification of their income, the support for scientific research is also constantly strengthening. Projects that require invoices occupy the main part of university income accounting, and the practice of pre-borrowing invoices is increasingly prevalent in universities. Meanwhile, electronic invoices have developed rapidly in recent years. According to the amendment to the Implementation Rules of the People's Republic of China Invoice Management Measures by the State Administration of Taxation on January 15, 2024, electronic invoices have the same legal effect as paper invoices, and no unit or individual may refuse them. Therefore, studying how to scientifically and efficiently manage pre-borrowing invoices under the background of informatization is of great significance to universities. This article aims to explore the reasons and risks of pre-borrowing invoices in universities under the new government accounting system, and propose targeted improvement

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suggestions for invoice management and accounting, in order to provide useful reference and reference for financial management in universities.

**Literature Review**

Through the analysis and review of existing literature, it is found that there are not many studies on pre-borrowing invoices at present, and the existing studies mainly focus on the risk and risk control of pre-borrowing invoices. Zhou Hua (2023) proposed that pre-borrowing invoices face the risk of invoice loss, and proposed control measures to optimize the approval procedures[1]. Wang Yantai (2022) analyzed the summary of risks brought by pre-borrowing invoices, and took S University as an example to conduct qualitative analysis and quantitative research on the management of pre-borrowing invoices in colleges and universities, summarized the existing problems in the management and accounting of pre-borrowing invoices in colleges and universities, analyzed the causes, and then proposed countermeasures and suggestions from accounting and business processes[2]. Wang Dong (2020) elaborated and analyzed the causes of the pre-borrowing notes, the existing risks, the existing control measures and other aspects, and put forward suggestions for the next step based on the daily work situation[3]. Gu Suxia (2018) specifically analyzed the risks arising from the pre-borrowing notes and proposed corresponding internal risk control measures[4]. Pan Lianzhou (2020) discussed the pre-borrowing bill business and put forward measures to prevent the risk of pre-borrowing invoice[5]. Xie Jianru (2017) analyzed the dangers of pre-borrowing invoices and proposed corresponding control measures[6]. Wu Hao (2016) analyzed the types of invoices and put forward targeted opinions on the pre-borrowing bill business[7]. Pang Jiubin et al. (2016) analyzed the risks in the management and practical operation of pre-borrowing invoices, and proposed to prevent risks through the electronization of invoices[8]. Li Xiaofang (2015) analyzed the possible risks of university research advance invoice and put forward some specific control measures in view of the existing risks[9]. Tan Xiaohui (2013) combined the basic spirit of the Measures for the Management of Financial Invoices and the new Measures for the Management of Invoice, analyzed the new situation faced by the current invoice management of colleges and universities, pointed out the status quo and existing problems of the invoice management of colleges and universities, and then discussed how to standardize the invoice management of colleges and universities[10].

Through the analysis of the existing literature, it is found that due to the reform of the government accounting system in 2019 and the implementation of comprehensive e-invoicing, some studies are no longer applicable to the current situation. In addition, although some studies have proposed risk control measures for pre-borrowing invoices, they have not combined with information means to build an operable invoice management system from the perspective of global finance. At the same time, there are few researches on the accounting of advance invoice based on information technology, and the research results are more complex, which is not suitable for the specific implementation of current universities. Therefore, this study is of great significance to analyze the pre-borrowing invoice from the perspective of management and accounting.

**Reasons for the Formation of Pre-borrowing Invoices**

The income of colleges and universities can be divided into two parts: taxable income and non-taxable income, according to whether they should pay VAT. Taxable income mainly includes the income of entrusted scientific research projects, rental income, and training income. Non-tax income mainly includes fiscal appropriation income, donation income, and income from subsidiary units.

The taxable income requires a value-added tax invoice. Taxable income requires the issuance of value-added tax invoices, and prepaid invoice business refers to a type of business where the invoice issuance time is earlier than the payment date. The trading habits of ‘invoicing first and then paying’ have gradually been recognized and existing in daily work[9]. The main reason for this phenomenon is that more and more units are demanding reimbursement based on invoices. Invoices have gradually become an important and essential reimbursement voucher. When paying, payment units generally need to rely on invoices to enter the account and make payments on a ‘corporate to corporate’ basis[9]. Therefore, this requires the payee to first issue invoices to the payer as proof of payment to the other party.

With the continuous expansion of university service functions, the accounting of VAT projects has occupied the main part of college income accounting. Therefore, the behavior of pre-borrowing invoices is becoming more and more common in universities.

**The Problems and Risks of Pre-borrowing Invoices**

1. Invoicing management methods are outdated, and the informatization level is low. At present, many colleges and universities still use manuals to manage invoices. Some units may use electronic spreadsheets to register borrowed invoices. Some units do not even register and are stored at the bottom of the invoice separately as a way of statistics. These management methods are not processed for accounting, and the refined management of pre-borrowing invoices cannot be achieved. The management model is relatively rudimentary and inaccurate. The entire process of lack of invoice management is supervised. The low level of invoice informatization is far from the concept of modern management accounting. It does not meet the strategy of information construction and development of colleges and universities. It has also become a bottleneck that restricts the development of the financial informationization level of colleges and universities.
II. Lack of internal control system for pre-borrowing invoices. Insufficient recognition of the importance of invoices, the issuance and review of invoices are often completed by the same person, the storage and custody of invoices are relatively casual, there is a lack of invoice management system, and the transmission of invoices is not scientifically and normatively considered. After borrowing advance invoices, due to the lack of accounting processing, there is a lack of communication between the drawer and the income accountant, and there is a common problem that advance invoices cannot be collected for a long time, which affects the quality of accounting information. Universities actively cooperate with pre-borrowing invoices, lacking pre-assessment and post-assessment. There is a lack of restrictive and punitive measures for situations where invoices cannot be received in a timely manner or cannot be received, or the implementation of measures is not strict.[5]

III. Increased financial risks for colleges and universities and reduced economic benefits. The essence of pre-borrowing invoices is a very serious job. It seems that the pre-borrowing invoice is just a bill that takes away, but in fact, this requires the school to pay taxes and fees. Every link is very important. The funds for pre-borrowing invoices cannot be inflow normally, which not only affects the scale of the school's income and expenditure, but also causes the cost of funds to pay funds in schools and other various expenses incurred by the school, bringing huge economic losses and financial risks to the school.

IV. Difficulty in borrowing invoices. Colleges and universities generally use two methods for pre-borrowing invoices. One is to include pre-borrowing invoices in the financial account; the other is that they are not included in the financial accounts, and then the income is confirmed. The first way brings great challenges to the school's financial accounting. The implementation progress of scientific research funds is inconsistent with the company's contracts. It may be hung for a long time, and confirming whether the income is confirmed when receiving the payment. In the second case, there are risks such as repeated invoicing, partially unable to account, and no deduction of taxes over the deduction period, and may even bring the risk of invoices to universities.

V. The number of pre-borrowing invoices has grown rapidly, increasing the difficulty of invoice management. However, in actual operation, in order to avoid their own financial risks, the other unit often requires the first invoicing and the payment. The financial payment must be based on the invoice issued by the other party and paid according to the invoice information. In order to promote the development of scientific research, some universities meet the needs of scientific researchers to a certain extent. However, with the rapid growth of research funding, the frequency of pre-invoicing has also increased significantly. This rapid growth brings new problems, such as the amount of pre-borrowing invoices cannot be in place in time and the loss of invoices. Especially when the pre-borrowing invoice is not processed in a timely manner, a large number of invoices are separated from the account, which undoubtedly increases the difficulty of invoice management and makes financial management face greater risks[6]. In addition, there are still irregular operations in the process of issuing and using invoices, which has also increased the pressure and risks of financial management.

Pre-borrowing Invoice Risk Prevention Measures

I. Strengthen Internal Control. In terms of internal control, colleges and universities should formulate relevant policies to comprehensively standardize and improve invoice management. In order to ensure the standardization of pre-borrowing invoices and reduce the school's financial risks, the invoice administrator must strictly monitor the entire process of borrowing invoices. In addition, the school should clearly define the division of labor and responsibilities of pre-borrowing invoices to ensure that each link is effectively managed, including contract review, corporate credit evaluation, contract execution and supervision, and not prompting accounts in time. For the responsibilities of various departments, a comprehensive accountability mechanism shall be established. Through these measures, you can better manage pre-borrowing invoices, improve teachers' awareness of the importance of invoices, standardize processes, reduce financial risks, and enhance the school's competitive advantage[6].

II. Contract Management. The pre-borrowing invoice of colleges and universities is based on the formal and approved effective contracts. Therefore, it is crucial to establish a contract management system, standardize contract management, and clarify relevant responsibilities through contract management. The borrower must hold a valid contract in order to borrow an invoice. Strengthening contract management can effectively avoid the risks brought by departmental advance borrowing of invoices.

III. Informatization Management. With the increase of scientific research projects in colleges and universities, the number of pre-borrowing invoices has continued to increase, and the informatization of invoice management can judge the age of accounts based on the pre-borrowing time and the degree of execution of the contract, and remind the invoices administrators in a timely manner to remind the invoice management in real-time. The situation of pre-borrowing invoices can not only increase the timely rate of money, but also help the timely confirmation of income, and reduce the financial risks of colleges and universities.

IV. Invoice Accounting Management. As an economic activity, the pre-borrowing invoices should be included in the accounting system, and should not be calculated outside the accounting balance sheet. Through the accounting management of invoices, this will not only increase the transparency of accounting, but also strengthen the management of invoices and reduce financial risks.

Based on the above measures, this study will analyze the information construction and accounting from two perspectives, and put forward feasible research measures. The first is to use information means, through the construction of advance invoice management system, the business process embedded in the information
system. Through the process and restrictions set in the system, the requirements of college finance for internal control, contract management and invoice management are realized. The second is to analyze the current accounting difficulties of pre-borrowing invoices, and put forward a new accounting method to help universities solve the problem of difficult invoice accounting treatment.

**Information Management Process for Pre-borrowing Invoices**

Researchers can efficiently complete pre-borrowing invoice procedures remotely, expanding the reach of financial services through convenient online operations. This enhances the level of financial digitization, improves efficiency, better serves scientific research, and mitigates the risk of pre-borrowing invoices. The specific operation process is shown in Figure 1, which can be summarized as follows:

(i) Faculty and staff submit a pre-borrowing invoice application through the online approval system. The system automatically matches the contract data in the contract system based on the information provided by the faculty and staff. If the contract has been signed, the system automatically reads the payment party information in the contract and obtains the electronic contract, and submits the electronic contract to the approval personnel for review in the form of an attachment. If the system detects that the teacher has not signed the contract, it will immediately prompt the teacher to sign the contract first, and then the teacher can proceed with the invoice pre-borrowing process.

(ii) After the approval personnel are approved, the system sends the invoicing information to the tax invoicing system. The system automatically generates an electronic invoice, and automatically sends it to the faculty in accordance with regulations. At the same time, the pre-borrowing invoice system will push the electronic invoice and contract to the financial system as the basis for accounting, and push the invoicing information to the contract system to help contract management.

(iii) After receiving electronic invoices and electronic contracts sent by the financial system, the bookkeeping process is automatically generated according to the preset vouchers, and electronic accounting files are generated. This process ensures the automation and accuracy of accounting treatment, improves the efficiency of work, and reduces the risk of artificial errors.

![Figure 1 Information Management Process for Pre-borrowing Invoices](image)

**Pre-borrowing Invoice Accounting**

The application, approval, and issuance of pre-borrowing invoices can be strengthened through informatization methods. The accounting problem is still a major problem that plagues the school. The following will be discussed based on the financial software of Tiancai Finance Software on the mainstream college on the market.

**(i) Pre-borrowing Invoice Accounting Requirements and Principles**

The issue of accounting is mainly involved in the confirmation of income. Under the new government accounting system, a business must be considered under two accounting systems: financial accounting and budget accounting.

(a) Revenue from financial accounting. The basis of accounting for financial accounting is the accrual basis. Income is the inflow of economic resources that guide the increase in net assets of colleges and universities and contain potential economic benefits. The uncomfortable receivables generated by the acts of providing technical services, training services, and rental assets are included in the receivables. In addition, as value-added tax is a type of value-added tax, it is recognized as financial accounting income at the amount excluding value-added tax. According to institutional regulations, after issuing invoices, universities should debit ‘accounts receivable’ based on the invoice amount. According to the amount excluding tax, credit accounts such as ‘business income/rental income/other income’. According to the value-added tax amount, credit the ‘payable value-added tax’.

(b) Budget Revenue under Budget Accounting. Under the framework of budget accounting, budget revenue constitutes an important component of its accounting, and this accounting mainly follows the principle of cash basis. Specifically, budget revenue refers to the cash inflows obtained by higher education institutions in accordance with relevant laws and regulations during the established budget year, and clearly included in the budget management system. It is worth noting that when universities issue invoices to external parties, as no actual cash inflows have occurred at this time,
corresponding entries are not recorded in budget accounting. When the funds are actually received, the university will recognize all cash inflows, including value-added tax, as budget revenue and debit the ‘fund balance’ account in the accounting entry, while crediting related accounts such as ‘business budget revenue’ or ‘other budget revenue’, in order to fully and accurately reflect the university's budget revenue situation.

In general, schools will pay value-added tax in the following month to generate cash outflows, which will be used for expense accounting. In order to control the project amount of teacher project funding effectively, many schools adopt a borrowing and lending approach when issuing invoices. Through project adjustments, the tax amount is separated from the teacher's project and collected into a unified project for unified management[2]. When paying taxes the following month, this portion of the tax will be deducted from the collected project expenses. This approach aims to ensure the rational use of funds and avoid unnecessary overspending.

For example, Teacher Li pre-borrowing an invoice of 2120 yuan for research project A, including 120 yuan for value-added tax. When the teacher pre-borrows invoices, the financial accountant debits ‘accounts receivable’ by 1200 yuan and credits ‘business income’ by 2000 yuan, assisting in accounting for project A and crediting ‘value-added tax payable’ by 120 yuan. The budget accountant does not keep accounts because it does not involve cash flow. When the funds are received, the financial accountant debits ‘bank deposits’ by 2120 yuan and credits ‘accounts receivable’ by 2120 yuan. The budget accountant debits ‘fund balance’ of 2120 yuan and credits ‘business budget revenue’ of 2120 yuan to assist in accounting for project A. Then, according to the value-added tax amount, debit ‘business expenses’ by 120 yuan, assist in accounting for project A, and credit ‘business expenses’ by 120 yuan, assist in accounting for the collection project.

(ii) Pre-borrowing Invoice Accounting Dilemma

According to the new system regulations, there are several difficulties in actual implementation:

(a) In project management, as university revenue is generally calculated based on project assistance, new projects need to be approved before accounting can be done. In practical work, some schools require that funds be credited before project approval, which does not comply with the approval requirements for new projects with pre-borrowing invoices. In addition, there are also situations where the funds cannot be received after pre-borrowing invoices, and it is unreasonable for the school to initiate the project first.

(b) In terms of technical implementation, most universities currently use Tiancai Financial Software, which controls project amounts through budget accounting. The principle of generating dual entries in Tiancai Financial Software is to automatically trigger the generation of budget accounting entries based on financial accounting. The last entry mentioned above cannot be technically achieved due to the lack of financial accounting comparison.

(c) Under the new government accounting system, revenue accounting in financial accounting is based on the accrual basis, and business income is determined based on contract progress. Universities can reasonably determine the degree of completion through methods such as cost, workload, completion progress, and completed time. However, in practical work, due to technical limitations and different project natures, it is difficult to determine the degree of completion[11]. Some projects may have even incurred expenses and determine income based on completion time, some projects may need to determine income based on incurred costs, and some projects need to calculate income based on work volume, which poses new requirements for financial personnel. In addition, some universities have large research funding, with many projects ranging from tens to hundreds of thousands. At the same time, the current financial system cannot meet the needs of revenue accounting, and if manual intervention is required for revenue recognition of each project, it is impossible to operate. In addition, the high proportion of research revenue in universities is also an important indicator for measuring the level of education of a university, which is highly valued by various universities. The accounting of this indicator is currently mainly based on the amount received. Therefore, although the system stipulates that financial income should be accounted for on the accrual basis, it is still not possible to achieve this in practical work.

(iii) Accounting Recommendations for Pre-borrowing Invoices

As mentioned earlier, the accounting issue of pre-borrowing invoices mainly involves revenue recognition. After the implementation of the new system, the issue of revenue recognition has been troubling universities due to the large number of projects, complex situations, and difficulty in determining contract progress. At present, there are two main methods of confirmation: a. Adopting the ‘expense-based receipt determination’ method; b. Using the 'cash basis' as the accounting standard for confirmation. For the processing of pre-borrowing invoices, financial accounting revenue is generally not recognized when pre-borrowing invoices. Therefore, this study continues to use this approach after a lot of attempts and thinking, balancing efficiency and the level of financial software informatization, and proposes an operational accounting method that can solve the above problems for reference.

(a) Establish a collection project

When the school pays value-added tax, it belongs to the outflow of cash, which corresponds to the generation of expenditure accounts in budget accounting. Expenditures need to be accounted for according to project assistance, so a collection project needs to be established to collect the provision and payment of value-added tax. The project balance represents the unpaid value-added tax that should be paid.

(b) Detailed Account Settings for Accounts Receivable

'Accounts Receivable' is used to account for the outstanding receivables of the school. Under this undergraduate program, a second-level subject called 'Advance Invoice' is set up specifically for the accounting of advance invoice transactions. Under this second-level subject, third-level subjects are established based on specific income categories,
including 'research project income', 'rental income', 'training income', 'examination income', etc. At the same time, all detailed accounts are set up for auxiliary accounting by department, project, and unit, and accounts receivable hedging is set up. This setting can, on the one hand, correspond to the detailed accounts under 'Accounts Receivable - Advance Invoice' one-on-one with the budget revenue account, which is conducive to generating double entries. On the other hand, it is convenient for querying and statistics, which is conducive to enhancing the management of pre-borrowing invoices.

(c) Accounting Processing of Pre-borrowing Invoices
This study will continue to use the above example for explanation, assuming that the collection item number is B. When pre-borrowing invoices, the financial accountant debits 'accounts receivable - pre-borrowing invoices - scientific research project income' based on the value-added tax amount to assist in accounting for project B. The person in charge is Teacher Li. Budget accounting does not keep accounts.

When the funds are received, the financial accountant debits 'bank deposits' by 2120 yuan, credits 'business income' by 2000 yuan, and assists in accounting for project A by crediting 'accounts receivable - prepaid invoices - scientific research project income' by 120 yuan, and the person in charge. Teacher Li; The budget accountant debits 'fund balance' by 2120 yuan, credits 'business budget revenue - A' by 2000 yuan, and credits 'business budget revenue - B' by 120 yuan.

When paying taxes the following month, the financial accountant debits 'Value Added Payable - B' by 120 yuan and credits 'Bank Deposit' by 120 yuan; The budget accountant debits 'business expenses - B' by 120 yuan and credits 'fund balance' by 120 yuan.

After the above accounting processing program, firstly, the balance of the VAT collection project B under the budget accounting is the VAT payable. In actual work, the balance of the collection project B reflects the VAT payable by the entire school. The project balance under the budget accounting of project research project A is the amount excluding value-added tax, which is the actual amount that the teacher can use and meets the requirements of project management. Secondly, the monthly balance of value-added tax accounts accurately reflects the amount of tax payable to the tax bureau for the month, and corresponds to the balance of value-added tax collection items. Once again, by querying outstanding accounts receivable, one can always understand the situation of borrowing invoices and urge outstanding payments to be credited in a timely manner. Finally, this method is easy to understand. Accounting is simple, implementable, easy to operate, and has strong practicality.

Conclusion
In the context of accounting information, pre-borrowing invoices have become an important task in the financial management of colleges and universities. With the reform of the government accounting system, pre-borrowing invoice management faces new challenges, but it also provides researchers with opportunities to understand the business. To ensure the standardization of pre-borrowing invoices, the government ought to implement pertinent policies, offer macro-level guidance, and facilitate the development of a cohesive management system within the industry. All universities should formulate pre-borrowing invoices for the school in accordance with national policies and actual conditions. In the process of formulation, colleges and universities should fully consider the needs of accounting informatization, and use informationization methods to strengthen supervision of pre-borrowing invoices. By establishing a complete invoice management system, standardizing the process of pre-borrowing invoices, reducing financial risks, and providing a strong guarantee for the healthy development of scientific research. In addition, colleges and universities should also strengthen training and education of financial management personnel, and increase their emphasis on the management of pre-borrowing invoices. Through training, financial management personnel can better master the relevant knowledge and skills of pre-borrowing invoices, and improve management efficiency and quality. The study of this article aims to increase the importance of invoices for colleges and universities, and provide certain reference significance for the management and financial treatment of colleges and universities. At the same time, it is also hoped that more scholars and experts will pay attention to and research the management of pre-borrowing invoices and jointly promote the continuous improvement and development of the financial management of colleges and universities.

REFERENCES


