



TRIPLE - ENTRY BOOKKEEPING: HISTORY AND BENEFITS OF THE CONCEPT

Marlene Gröblacher*,
Vule Mizdraković

Singidunum University, Belgrade,
Serbia

Abstract:

With the emergence of the blockchain technology another concept is revived – triple-entry bookkeeping. The term first occurred in 1989 in a paper written by Yuji Ijiri, this alternative accounting system was expanded at a later time. The Double entry bookkeeping evolved around the 1300s AD in Italy and is still being used to this day. Having in mind that this system is prone to error and fraud, this paper examines how triple entry bookkeeping contributes to transparency, future reference, reconciliation, assurance and auditing. Therefore, the analysis is carried out systematically, uniformly and consistently. Additionally, the changing role of external auditors in everyday operations will be evaluated and the paper concludes with a discussion of a proposed solution for the principal-agent problem

Keywords:

double entry bookkeeping, blockchain, audit, distributed ledger technology

INTRODUCTORY

The main purpose of financial reporting has always been providing information for the main stakeholders. It can be observed as an attempt to convince main users of financial reports of the legitimacy of business ventures (Carruthers & Espeland, 1991). However, bookkeeping as the base of financial reporting developed and transformed together with the economy or the way business entities operate. Every single stage of economy development affected the bookkeeping. For example, the use of the Internet and informatics changed the way business entities operate these days. As a result, the cloud accounting and other modern accounting concepts emerged. The development of blockchain technology revamped one of the older accounting concepts – triple-entry bookkeeping system. The purpose of this paper is to provide the analysis of the advantages this system could have in the use and the main differences between single and double entry system. The paper is structured as follows; the next section will provide a brief overview of double-entry bookkeeping system. The third part will address the triple-entry bookkeeping, the history of the concept and how it helps in providing reliable financial reporting. Afterwards, main conclusions and brief discussion will be provided.

Double and single entry bookkeeping system

It is previously mentioned that double-entry system appeared in Italy, somewhere between 1250 and 1350, as a result of commercial revolution (Bryer, 1993). There, from several larger northern Italian cities, it spread across the country and was supported by the transition of capital to social capital (Yamey, 2005). Double-

Correspondence:
Marlene Gröblacher

e-mail:
marlene.groblacher.16@singimail.rs



entry bookkeeping system provided a support for the calculation of return on capital or equity, which was the base of social capital. The logic behind this double-entry system is that every transaction has to be recorded on at least two accounts and that for every “debit” there must be a “credit” (Bryer, 1993). Previous means that every transaction has to be recorded at least twice in order to maintain the balance sheet equation. Some of the transactions will affect only the structure of the assets of a business entity, for example realized payments from entity’s buyers. Those transactions will not affect the amount of equity disclosed in the balance sheet. However, some other transactions will affect both assets and liabilities of an entity. For example, when an entity sells goods or services the transaction will affect the amount of equity through the income statement accounts and the amount of assets through the changes or inventories or cash and cash equivalents or account receivables.

Other transactions will result in changes in the amount of liabilities disclosed in the balance sheet. For example if a bank allows an entity to return borrowed assets in three years instead in a current year, those liabilities will become long-term liabilities. The transaction will change only the structure of the liabilities, from short-term to long-term liabilities, but not the disclosed amount. The main benefit of this system is an insight into the amount of earned equity in the observed reporting period. That information is very significant for most shareholders of an entity, its owners and investors predominately. If the result earned in the observed period is divided by the amount of equity at the beginning of the period, return on equity is calculated. However, this is possible because there is a report that discloses all revenues and costs and the difference as a net result. Before the Income statement there was only Balance sheet and the earned equity was calculated as a difference between the amount of equity at the end and the beginning of the reporting period. If the amount is positive there was a net gain and net loss in the opposite. The lack of this method of net result calculation was the absence of information on how the net result occurred. That was the main reason why Income statement was invented. Also, as it was previously mentioned, commercial revolution was one of the reasons why bookkeeping was invented. Namely, Italian merchants wanted to know the total amount of money they are claiming from their debtors, the amount of payment they received till certain moment and the amount their debtors still owe to them. That is how the debit and credit parts of account came to be. Back in the days, travel was an every-day activity of the merchants. Sometimes they used to sell or buy items for their clients (“silent partners”), so when they return from a journey, they were expected to provide some documentation or reporting to their clients in order to justify their transactions. Bookkeeping proved very useful in that context.

There is also another explanation of the terms mentioned, author Sangster (2016) argues that bookkeeping of this form most likely emerged in a bank, probably in Florence, Italy. Local bankers provided a clear and unambiguous picture of the accounts of all of their debtors and creditors. Banks borrowed money from creditors, hence the credit side and later invested the money to debtors for an interest, hence the debit side. It was significant to them to be able to check if the entries were complete and accurate.

Beside double-entry there is also single-entry bookkeeping which is still used in practice (in the Republic of Serbia, for example, in very small - micro business entities). When using this system the transaction will not necessarily be recorded on two accounts. It is still possible to calculate net result by observing corresponding account and transactions recorded on it, but the process is not inherently continuous as it is when double-entry bookkeeping is used.

Chronological development of the term triple-entry bookkeeping and semantic change

The term triple entry bookkeeping first occurred in 1982 in a paper written by professor Yuri, the corresponding framework was further elaborated by him in a paper in 1986. To illustrate, the development of the term triple entry bookkeeping, the table below indicates the year of the publication and the author that dealt with the term in their work. Subsequent to the table, a brief overview of the utilization and connotation of the term the authors Y. Ijiri and I. Griggcan may be found. While, E. Melse suggested several analyses of the application of Y. Ijiri’s framework for triple entry bookkeeping.



Table 1

Year of publication	Author	Title of the paper
1982	Y. Ijiri	Triple-Entry Bookkeeping and Momentum Income
1984	Y. Ijiri	Measurement of Wealth, Income and Force
1986	Y. Ijiri	A Framework for Triple-Entry Bookkeeping
2005	I. Grigg	Triple Entry Accounting
2008	E. Melse	Accounting in three dimensions: a case for momentum
2009	Emergence of blockchain technology	
2010	E. Melse	Momentum Accounting for Trends: Relevance, Explanatory and Predictive Power of the Framework of Triple-Entry Bookkeeping and Momentum Accounting of Yuji Ijiri (textbook)

Source: (Ijiri, 1982), (Y. Ijiri, J. Noel, 1984), (Ijiri, 1986), (Grigg, 2005), (Melse, 2008), (Melse, 2010)

The term triple entry bookkeeping originates from a paper written in 1982 by Professor Yuji Ijiri. This paper entitled “Triple-entry bookkeeping and momentum Income” was extended in 1986 in the following paper: “A framework for triple entry bookkeeping”. In the previously mentioned paper are placement for the standard accounting equation was introduced, as a result a new assessment of wealth was developed.

In the first place, in the double entry bookkeeping system, the flow accounts serve one purpose – to explain changes in the stock accounts, for this purpose the following formula shall be used $\Delta\text{Stock}_n = \text{Flow}_n$. While, in triple entry bookkeeping new accounts are being added to explain the changes in the flow accounts.

Nevertheless, the double entry bookkeeping system is a static one, as the assessment of income requires determining two points in time. Whereas, momentum shows the state (of Income being earned) at any single point in time which makes it a dynamic assessment (Income = realization of momentum as time passes) and momentum being defined as the rate at which income is being earned.

This equation allows an assessment at any given point of time, unlike double entry bookkeeping system in which two points have to be specified for one period. Accordingly, accountants acquire a different perspective considering the financial forecast of an enterprise. In a word, accounting systems will be more dynamic and not focused on the present state (Balance Sheet), but on the future forecast (Ijiri, 1986). Today’s connotation of the term triple entry bookkeeping bears no relation to the original semantic use of the same word, as Y. Ijiri implemented scientific component to redefine a sociological matter by introducing the phenomena of force and momentum into the standard accounting techniques.

In 2005, I. Grigg published a paper entitled “Triple Entry Accounting”, in which the standard accountancy techniques are linked with financial cryptography in the form of a signed receipt, in consequence a more resilient system, which entails a decrease in costs by providing more reliable and supported accounting, is being formed.

The digital signature contributes to the creation of a record with a higher level of reliability, as it is impossible to verify the same one if an alternation of its details took place. At the same time, all participants possess the same information, which in turn leads to the elimination of asymmetrical information (Grigg, 2005).

Nowadays the triple entry bookkeeping system is associated with distributed ledger technology and mostly used within the context of blockchain technology, which is a distributed ledger technology that can include smart contracts.

The distributed ledger technology represents a decentralized maintenance of one or multiple ledgers from different parties. Appropriate measures are taken to ensure that newly added transactions are adopted in all copies of the ledger and that there is an agreement (consensus) on the current status of the ledger (Metzger, 2019).

Referring to smart contracts, these are electronic contracts which are programmed as a software, which executes itself once one of the given contract requirements is fulfilled. Hence, linked actions, such as payments, are executed automatically if a corresponding trigger is present. A corresponding trigger in this case would be the fulfillment of one of the contract requirements (Mitschele, 2019).

Ultimately, the double entry bookkeeping is being expanded into triple entry bookkeeping with a third entry serving as a link between two double-entry ledgers. This suggests that, the third entry functions as a proof of work in order to confirm that it was seen by all participating parties. Having that in mind, it would serve as an entry and as a receipt at the same time. Due to this link, an error or fraudulent attempt of manipulation would be easily noticeable.

In conclusion, the triple entry bookkeeping contributes to more transparency, trust, assurance, reconciliation and future reference.



CONCLUSION

As previously mentioned, today's connotation of triple-entry accounting mostly goes along with I. Grigg's concept fused with distributed ledger technology, compromising blockchain. It can be concluded that with this system, as earlier mentioned, the elimination of asymmetrical information would enter into force. In this sense, when considering the subject of bookkeeping the principal agent problem can be regarded as "solved".

In general, such a system contributes to the elevation of public trust, which so far was obtained through external auditors. Therefore, this raises questions concerning the future development of the occupation of external auditors and which new opportunities might arise from it for audit processes. It is reasonable, to assume that audits would become less time consuming and, in turn, would allow external auditors to focus on value adding areas, such as internal control systems, especially regarding the IT area.

Even though, the present context of triple entry bookkeeping excludes Y. Ijiri's concept, since it was influenced by the physical components of force and momentum and its underlying purpose was to shift managers' attention to the future development of a company instead of the present state, to the present day it remains subject to researchers' concerns as it can be seen by the example of E. Melse.

The main advantage compared to the previous methods used in the double entry bookkeeping system is the raise of public trust and transparency, as well as higher barriers concerning fraud and manipulation of electronic data. Taking into consideration, that the double entry bookkeeping system is being used for decades, it must be noted that a transition to a new system would take a long time. Moreover, the implementation would be prone to several errors as the digitalization in accounting, compared to other industries, is not yet that advanced. Thus, it might be too early for the implementation of such a disruptive system.

LITERATURE

1. Bryer, R. (1993). Double-entry bookkeeping and the birth of capitalism: Accounting for the commercial revolution in medieval northern Italy. *Critical Perspectives on Accounting*, 113-140.
2. Carruthers, B., & Espeland, W. (1991). Accounting for Rationality: Double-Entry Bookkeeping and the Rhetoric of Economic Rationality. *American Journal of Sociology*, 97 (1), 31-69.
3. Grigg, I. (2005, 12 25). Triple Entry Accounting. Retrieved from Triple Entry Accounting: http://iang.org/papers/triple_entry.html
4. Ijiri. (1982, 12). Triple-Entry Bookkeeping and Momentum Income. *American Accounting Association*, 51-53.
5. Ijiri, Y. (1986). A Framework for Triple-Entry Bookkeeping. *The Accounting Review*, Vol. LXI, No. 4, 745-759.
6. Melse. (2008). Accounting in three dimensions: a case for momentum. *The Journal of Risk Finance*, 334-350.
7. Melse, E. (2010). Momentum Accounting for Trends: Relevance, Explanatory and Predictive Power of the Framework of Triple-Entry Bookkeeping and Momentum Accounting of Yuji Ijiri. -: VDM Verlag Dr. Müller.
8. Metzger, J. (2019, 09 23). Gabler Wirtschaftslexikon. Retrieved from Distributed Ledger Technologie (DLT): <https://wirtschaftslexikon.gabler.de/definition/distributed-ledger-technologie-dlt-54410>
9. Mitschele, P. D. (2019, 09 12). Gabler Wirtschaftslexikon. Retrieved from Smart Contract: <https://wirtschaftslexikon.gabler.de/definition/smart-contract-54213>
10. Sangster, A. (2016). The Genesis of Double Entry Bookkeeping. *The Accounting Review*, 91 (1), 299-315.
11. Y. Ijiri, J. Noel. (1984, 01). Gwern. *The Accounting Review*, Vol. LIX, No. 1, 52-63. Retrieved from A Reliability Comparison of the Measurement of Wealth, Income and Force: <https://www.gwern.net/docs/bitcoin/1984-ijiri.pdf>
12. Yamey, B. (2005). The historical significance of double-entry bookkeeping: Some non-Sombartian claims. *Accounting, Business & Financial History*, 15 (1), 77-88.