

## Adaptability of Indirect Methods in Income Reconstruction: A Systematic Literature Review

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**Abstract:** This research aims to evaluate the adaptability of indirect methods in income reconstruction across various forensic cases. Income reconstruction is an important method in forensic audits to uncover hidden income, especially in cases of fraud and tax evasion. However, there are often limitations in data access, so indirect methods are needed to estimate revenue. Through the Systematic Literature Review (SLR) approach, this article examines the application of indirect methods in investigating tax and corporate financial fraud. Data was obtained from the Scopus database and analyzed to determine the effectiveness of this method in the context of limited data. The results of this study indicate that indirect methods in income reconstruction are highly adaptable for identifying hidden income, particularly when data is limited. This research highlights the important role of indirect methods as tools in forensic accounting with wide practical applications.

**Keywords:** Income Reconstruction, Indirect Methods, Systematic Literature Review

### Introduction

The indirect method is used to uncover unreported income by taxpayers. It is applied in cases where financial records are inadequate, fail to reflect taxable income, or when there is a possibility that taxable income has been omitted. Additionally, when there are significant increases in net worth from year to year, major shifts in the gross profit percentage, or when expenses exceed reported income without a clear justification, this method can be utilized in place of the direct method employed by the IRS (Crumbley et al., 2015).

This study aims to examine the adaptability of the indirect method in income reconstruction within a forensic context through a Systematic Literature Review (SLR) approach. The motivation behind this research is driven by the need for more effective analytical approaches to detect increasingly complex financial fraud and income concealment. Given that the direct method often proves challenging to apply when available information is limited or incomplete, the indirect method emerges as a viable alternative. However, a systematic and in-depth examination of the effectiveness, limitations, and applications of this method in forensic contexts remains largely unexplored.

The importance of the indirect method in forensic contexts has not been extensively explored systematically. This is particularly relevant amidst the growing need for reliable methods to identify hidden income and non-compliance

that may go undetected through conventional methods. By conducting a Systematic Literature Review (SLR), this study seeks to evaluate the application of the indirect method across various forensic cases. The findings of this research will provide insights into the extent to which the indirect method can be adapted to different types of forensic cases, offer guidance for practitioners, and enrich the theoretical foundation in the field of forensic accounting.

## **Literature Review**

### ***Indirect Method***

The indirect method involves determining tax liabilities by analyzing a taxpayer's financial affairs using information from various sources beyond the taxpayer's declarations and formal records. This approach is used to identify unreported income, especially when the available financial records are insufficient, do not reflect taxable income, or suggest that taxable income has been omitted (Biber, 2010). Additionally, the indirect method is appropriate in situations where there is a significant increase in net worth year-over-year, substantial changes in the gross profit percentage, or when expenses exceed reported income without a clear explanation. This method aims to provide a reasonable estimate of the taxpayer's actual liabilities based on indirect evidence (Crumbley et al., 2015).

#### ***a. Market Segment Specialization Program (MSSP)***

The IRS developed a program to train tax examiners on specific markets, such as construction, entertainment, law, and real estate, producing Audit Technique Guides (ATGs) with examination techniques, industry issues, business practices, and key terms to enhance audit efficiency. Forensic accountants also use ATGs to understand industry procedures and internal controls, aiding in the detection of unreported income. For example, in trucking, ATGs suggest verifying driver manifests to ensure revenue accuracy. Public data, like property records and vehicle licenses, can also support forensic investigations, making fraud detection more effective (Crumbley et al., 2015).

#### ***b. Cash-T***

The cash-T is a tool used in accounting to track cash flow and cash balances. It helps compare the cash available at the beginning of a period, cash received during the period, cash spent during the period, and the cash on hand at the end of the period (Oecd, 2006). Cash-T can be used in forensic accounting to detect discrepancies in cash flow. By analyzing cash receipts and expenditures, forensic accountants can identify potential cash theft or skimming schemes (Crumbley et al., 2015).

This method is based on the principle that all cash transactions, whether business-related or not, recorded by the taxpayer during the reviewed period must be reflected in the T-account. Non-cash items, such as depreciation, inventory, and work in progress, are excluded from the T-account to focus solely on cash flow (Oecd, 2006).

#### ***c. Source and Application of Funds Method (Expenditure Approach)***

The Source and Application of Funds method, also known as the expenditure approach, is based on the theory that if expenses exceed reported income plus income from unreported sources in a specific tax period, the excess

expenditure represents unreported income from taxable sources (Oecd, 2006). This method is used to analyze a taxpayer's cash flow by comparing all known expenses with all known receipts for the period. It is particularly useful when taxpayer deductions and other expenses appear disproportionate to reported income or when the taxpayer's cash does not all flow from bank accounts that can be analyzed (Rettig, 2014).

This method is based on the theory that if a taxpayer's expenditures exceed their reported income plus any unreported income sources, the excess spending represents undeclared income from taxable sources (Biber, 2010). This method is typically used when the taxpayer's deductions and other expenditures appear disproportionate to the reported income, or when the taxpayer's cash flow does not entirely pass through bank accounts that can be analyzed (Oecd, 2006).

**d. Net Worth Method**

The Net Worth Method is based on the theory that any increase in a taxpayer's net worth during a tax year, adjusted for nondeductible expenses and nontaxable income, must be derived from taxable income (Rettig, 2014). This method is generally recommended in situations where multiple years are being examined, significant changes in assets and liabilities occur during the period, or where books and records are either not kept, inadequate, or unavailable (Oecd, 2006).

The taxpayer's net worth (total assets minus total liabilities) is determined at the beginning and end of the taxable year. The difference between these two amounts represents the increase or decrease in net worth. Adjustments are then made for non-deductible items and non-taxable income to reconstruct the taxable portion of income (Rettig, 2014). This method is recommended when two or more years are under review, there are significant changes in assets and liabilities during the period, or when no books and records have been kept. It is also used when the taxpayer's books and records accurately reflect the figures reported, yet there remains suspicion of unreported income (Mayr, 2017).

**e. Bank Deposit Method**

The Bank Deposit Method is based on the premise that money received by a taxpayer must either be deposited or spent. This method reconstructs income by analyzing bank deposits and cash expenditures to determine taxable income (Biber, 2010). The Bank Deposit Method provides a comprehensive picture of a taxpayer's financial activities, reflecting the scale and scope of their financial transactions. It eliminates the need to document business expenses, except for technical adjustments such as depreciation (Crumbley et al., 2015).

The Bank Deposit Method provides a comprehensive view of a taxpayer's activities, clearly reflecting the scale and scope of their financial operations. It also eliminates the need to document business expenses, except for technical adjustments like depreciation (Zoitsas et al., 2020). The formula for using the Bank Deposit Method is: Total deposits (including business and personal accounts) + Cash expenditure (cash payments for business, capital, and private expenses) + Increase in cash on hand - Nontaxable receipts = Gross receipts as corrected - Gross receipts as per declaration = Understated income (Biber, 2010).

**f. Contract and Procurement Fraud**

Contract and procurement fraud involves illegal activities like bribery, kickbacks, and fraudulent bidding to manipulate the procurement process. A valid

contract requires offer and acceptance, legal purpose, mutual capacity, exchange of value, proper form, and free agreement. In case of breach, the injured party can seek compensation, but proving fraud requires evidence of intentional deception, which is often hard to establish in civil or criminal cases (Crumbley et al., 2015).

Effective detection and prevention of contract and procurement fraud require a combination of thorough financial investigation, adherence to legal standards, and the use of advanced analytical methods. Collaboration among various agencies and the application of indirect methods can greatly enhance the accuracy and reliability of fraud detection efforts (Mayr, 2017).

#### ***g. Piercing the Corporate Veil***

Piercing the corporate veil refers to a legal decision where a court disregards a company's separate legal status and holds its shareholders or directors personally liable for the company's actions or debts. Courts consider several factors before piercing the veil, such as failure to hold board meetings, non-compliance with corporate formalities, or mixing personal funds with company funds. To prevent this, companies must adhere to required formalities, document key business actions, and separate personal assets from business assets. Forensic accountants can help identify violations of these rules by analyzing financial documents and business practices (Crumbley et al., 2015).

## **Methods**

This research utilizes a systematic literature review (SLR) approach. The keywords used in the literature search include "indirect income reconstruction," with a focus on exploring discussions related to the indirect method in income reconstruction. The search was conducted without restrictions on the time period to provide a broad perspective on the research developments and adaptability of the indirect method in income reconstruction. The literature search included only sources relevant to the themes of this SLR. The selected articles were analyzed to identify common themes, methodologies, and research findings related to the effectiveness, limitations, and practical applications of the indirect method in forensic income reconstruction.

## **Findings**

This section will develop research on indirect methods in income reconstruction, based on a systematic literature review (SLR) of studies obtained, including various articles. The literature mapping results reveal 4 articles that focus on the application and effectiveness of indirect methods in detecting unreported income. These articles collectively highlight the diverse applications of indirect methods in forensic accounting and their effectiveness in uncovering fraudulent financial activities.

**Table 1. Article Identification**

	<b>Artikel 1</b>	<b>Artikel 2</b>	<b>Artikel 3</b>	<b>Artikel 4</b>
<b>Title</b>	Reconstructing income inequality in a colonial cash crop economy: five social tables for Uganda, 1925–1965	Indirect Auditing Methods for Individuals Subject to Income Tax	INDIRECT METHODS IN ASSESSING ILLEGAL ORIGIN OF INCOME AND ASSETS	INDIRECT METHODS OF ESTIMATING TAX LIABILITIES - THEORETICAL AND PRACTICAL ASPECTS
<b>Penulis</b>	MICHIEL DE HAAS	Aggelos Zoitsas, Dimitrios Valsamidis, Theofilitsa Toptsi, and Konstantina Tsoktouridou	Branko Mayr	Vlad VLAICU
<b>Publication Year</b>	2021	2020	2017	2023
<b>Research Methods</b>	Quantitative Method	Quantitative Method	Qualitative Method	Quantitative & Qualitative Method
<b>Abstract</b>	This research adds to the growing body of literature on historical inequality in Africa by providing five social tables and income inequality estimates for Uganda from 1925 to 1965. The findings show that income inequality remained relatively stable and generally low compared to other African colonies. Through decomposition,	This paper offers a comprehensive guide to tax audits, compiling various indirect audit methods used both in Greece and internationally. It also assesses the scope of the hidden tax base and the potential amounts that could be uncovered and taxed. The purpose of the study is to introduce indirect audit methods, which are considered the future of tax audits. These methods are	The primary task of financial investigators is to examine assets that have an illegal origin. To prevent errors in evaluating such assets, investigators must adhere to professional guidelines. When assets of illegal origin are seized, it is essential to accurately identify them (Mayr, 2017).	This article presents an in-depth study on indirect methods used to estimate the income of both individuals and entities, including residents and non-residents. It focuses on control mechanisms based on information obtained from indirect sources and aims to identify taxpayers who have earned income but failed to declare it. The significance of

<b>Artikel 1</b>	<b>Artikel 2</b>	<b>Artikel 3</b>	<b>Artikel 4</b>
<p>significant underlying divisions and changes were revealed. A substantial portion of the overall inequality was attributed to the income gap between the African majority and a small elite of Asians and Europeans. Over time, inequality among Africans grew. Self-provisioning income played a crucial role in reducing inequality in Uganda's economy, which was marked by land abundance and widespread smallholder cultivation of labor-intensive export crops (De Haas, 2022).</p>	<p>primarily applied to individuals since experience shows that money that avoids taxation often ends up with one or more individuals. The paper discusses how this issue can be detected during a tax audit, how it can be assessed, and how underreported income is converted into taxable income. The study also examines the challenges, opportunities, legislative frameworks, and the overall impact of indirect audit methods in reducing tax evasion, supported by empirical research. A survey consisting of 31 questions was completed by 102 tax employees in the Macedonia and Thrace regions between May and September 2017. Factor analysis using principal components method and varimax rotation</p>		<p>these methods is undeniable, as they are widely implemented in countries with effective tax systems. Using these methods, it becomes possible to determine concealed tax obligations from dishonest taxpayers. Over the past five years, the application of these methods has increased in the Republic of Moldova, helping restore fiscal fairness, reduce tax evasion, and enhance state tax revenues. As a result of applying these methods, undeclared income is typically uncovered, and taxes on this income, along with penalties and fines, are imposed (Vlaicu, 2023).</p>



Artikel 1	Artikel 2	Artikel 3	Artikel 4
	<p>was employed to explore the relationships among various items. The analysis identified four factors based on 21 survey questions. Additionally, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were used to determine whether the data were suitable for factor analysis, with all statistical procedures conducted using SPSS version 22 (Zoitsas et al., 2020).</p>		

## Discussion

The use of indirect methods in income reconstruction has proven effective in uncovering hidden income across diverse contexts, especially in scenarios where available data is limited, incomplete, or unreliable. These methods offer alternatives to direct examination of financial records, allowing investigators to estimate income based on related financial indicators. Each indirect method discussed in this study has unique strengths and specific challenges, making them suitable for different types of cases based on the complexity, data availability, and underlying financial patterns involved.

For instance, the Cash-T method is particularly useful in cases where cash transactions dominate, and a digital transaction trail is absent. This method focuses on reconstructing cash flow by analyzing sources and applications of cash within a specific period, enabling investigators to track discrepancies that might suggest unreported income. Cash-T becomes especially relevant in industries and contexts where cash flow is frequent, such as retail or certain sectors within the informal economy. However, if these cash transactions are difficult to trace, lack sufficient documentation, or involve unrecorded transactions, the method's effectiveness is reduced. Cash transactions,

especially when undocumented, pose inherent challenges since they rely on estimations based on available evidence. Furthermore, Cash-T requires significant data on expenditures and income sources, and any unrecorded outflows or inflows could compromise its accuracy.

The Net Worth Method is well-suited for long-term investigations where changes in assets and liabilities can provide insights into hidden income. This method examines increases in an individual's or entity's net worth, adjusted for expenditures and nontaxable income, to estimate taxable income. The Net Worth Method is particularly effective in cases involving individuals with significant assets, such as high-net-worth individuals or corporate executives, as their wealth accumulation can be more readily observed and analyzed over time. However, the success of the Net Worth Method depends heavily on access to accurate, comprehensive data on the individual's or entity's assets and liabilities, which is often difficult to obtain. Confidentiality constraints, incomplete records, or discrepancies in the valuation of assets can hinder the accuracy of this method. For example, the method requires regular valuation of physical assets (e.g., real estate, vehicles) and financial assets (e.g., stocks, bonds), which can vary over time. Therefore, while the Net Worth Method can be a powerful tool for identifying hidden income, it demands precise data to avoid underestimating or overestimating net worth growth.

The Bank Deposit Method enables a comprehensive analysis of financial transactions by matching income with expenditures, offering a way to examine an individual's or entity's cash flows in detail. This method involves evaluating bank deposits and comparing them to reported income to detect unreported inflows that may indicate hidden income. Since bank accounts often capture most transactions in today's financial environment, the Bank Deposit Method is widely applicable in forensic accounting and tax audits. However, access to full banking data is often challenging due to privacy laws and restrictions. In cases where accounts are held in jurisdictions with strict banking confidentiality, investigators may be limited in their ability to obtain relevant records. Moreover, when individuals use multiple bank accounts or transfer funds between accounts, tracking these transactions becomes complex. Despite these challenges, the Bank Deposit Method remains an invaluable tool, especially when combined with other methods to form a more holistic approach to income reconstruction.

The Expenditure Approach, also known as the Source and Application of Funds Method, is based on the assumption that if a taxpayer's expenses exceed their reported income, then the excess amount represents unreported income. This approach is valuable in scenarios where lifestyle and spending patterns suggest income levels higher than reported. The Expenditure Approach is commonly used in cases of fraud and tax evasion to estimate unreported income by assessing living expenses, luxury purchases, and other high-cost items. However, its effectiveness relies on detailed information about the taxpayer's expenditures, which may not always be available or fully disclosed. Additionally, this approach assumes a direct correlation between income and expenditure patterns, which may not always hold true if the individual has significant savings or other financial sources.



### **Opportunities for Enhancing Indirect Methods in the Digital Era**

In the digital age, new opportunities are emerging to enhance the effectiveness of indirect methods through the integration of data from multiple sources. Access to a wide range of data—such as public records, digital transaction logs, and other digital footprints—can enable investigators to form a more comprehensive view of an individual's financial activity. Big data analytics and machine learning offer tools to process and analyze this vast amount of information to identify patterns indicative of hidden income.

Big data technology enables the aggregation and analysis of data from diverse sources, including social media, online transaction logs, and third-party financial data, which can reveal consumption patterns or lifestyle discrepancies that suggest hidden income. For example, analyzing patterns in social media posts about luxury purchases or travel can provide indirect evidence of spending behavior inconsistent with reported income. Machine learning algorithms can further enhance the detection of income anomalies by learning from past fraud patterns and identifying deviations from typical behavior. While these technologies offer great potential, their use raises significant privacy and ethical concerns. Access to personal data and potential misuse of information are major challenges in this approach, and safeguards must be established to ensure ethical and lawful use of technology in investigations.

### **Policy and Regulatory Implications of Indirect Methods**

The use of indirect methods in income investigations has significant policy implications. In many countries, regulations restrict access to personal financial data to protect individuals' privacy. These restrictions, while protecting citizen rights, can hinder the implementation of indirect methods that rely on comprehensive financial data. On the other hand, some countries have begun to adopt policies that allow more flexible access to financial information for investigative purposes, particularly in tax evasion and money laundering cases. The findings of this study suggest the need for policymakers to support the use of indirect methods through regulations that allow controlled and purpose-driven data access. Such policies should aim to strike a balance between respecting individual privacy and ensuring transparency and accountability in financial activities.

Furthermore, international cooperation can play a key role in improving access to financial data across jurisdictions, particularly in cases involving offshore accounts and cross-border transactions. Given the global nature of financial systems, international agreements on data sharing and cooperation between regulatory authorities can enhance the effectiveness of indirect methods, especially in combating tax evasion and financial fraud on a global scale.

### **Potential for Hybrid Methodologies and Future Methodological Developments**

Based on the study's findings, there is potential for developing hybrid methodologies that combine multiple indirect methods within a single investigative framework. For instance, combining the Net Worth Method and the Bank Deposit Method can provide a more comprehensive picture of an

individual's assets, liabilities, and cash flows, resulting in a holistic approach to income reconstruction. This hybrid approach is particularly valuable in complex cases where single-method analysis may miss subtle financial discrepancies. By combining methods, investigators can cross-verify findings, increasing the robustness of their conclusions and minimizing the risk of inaccuracies.

Future methodological development may also involve incorporating advanced technologies such as blockchain analysis, which can trace transactions in decentralized digital currencies, addressing challenges in detecting hidden income in the form of cryptocurrency. Additionally, advances in predictive modeling and risk assessment algorithms can help investigators identify high-risk cases, enabling more targeted and efficient use of indirect methods. As technology continues to evolve, adapting these new tools within the framework of indirect income reconstruction methods will be essential for addressing increasingly sophisticated methods of income concealment in the digital era.

## **Conclusion**

This study demonstrates that indirect methods in income reconstruction have high adaptability and offer effective solutions in various forensic contexts, particularly when direct data is insufficient or difficult to access. Each indirect method has specific advantages for identifying hidden income in particular situations, although there are some limitations related to data access and the need for supporting regulations. The adaptability of these methods provides practical solutions for forensic accountants to handle cases where direct methods are less effective, such as in investigations of tax fraud, tax evasion, and income concealment.

Additionally, the findings of this study highlight that the effectiveness of indirect methods can be further optimized through the integration of advanced data analytics technologies, such as big data and machine learning. These technologies allow for more comprehensive investigations by providing access to data from multiple sources, identifying patterns that may not be directly visible, and expediting the investigation process. However, the use of these technologies also raises privacy and ethical challenges that need to be addressed, requiring strengthened data protection policies and regulations to balance individual privacy rights with the need for financial transparency.

Furthermore, this study demonstrates the potential for developing hybrid approaches that combine several indirect methods, such as the Net Worth Method with the Bank Deposit Method, to produce more thorough and accurate analyses. This hybrid approach is especially effective in complex cases where a single-method analysis may be inadequate. In the future, developing methodologies that combine traditional approaches with new technologies—such as blockchain analysis for tracking digital assets or predictive algorithms for identifying high-risk cases—will be essential to improve the accuracy and efficiency of hidden income detection.

Future research is recommended to test the application of these indirect methods using empirical data from real-world cases with high complexity, such as in the context of digital transactions and cryptocurrency use. The use of data-based simulations or experiments could also strengthen evidence of the cost-

effectiveness and accuracy of these methods in uncovering hidden income. Further research should also explore the integration of technology into indirect methods to enhance detection speed and accuracy, ensuring that these methodologies remain relevant in an increasingly complex digital era.

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