
Conceptualising Tax Avoidance on Industry 4.0 in Tanzania: The Imperatives of Value Chain Analysis

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Abstract:

Purpose: *This study will accrue and extend perspectives of tax avoidance on taxable income which is currently impractically hidden on sophisticated transactions in Industry 4.0.*

Design/methodology/approach: *The study will explain source in tax avoidance on Industry 4.0 through value chain analysis. To explain relationship between key concepts data from tax officials and consultants, electronic manufacturing and service companies in Tanzania will be applied.*

Findings: *In the current climate of economic crisis, governments are implementing budget cuts in an effort to cope with national debts and aftereffects of COVID 19 as a whole.*

Practical implementations: *Findings from this study will share the field of knowledge of value chain analysis for proactive response from both government and private sector in identifying sources of tax avoidance to Industry 4.0, and to engage stakeholders affected by tax policy issues and expose findings for policy review and scrutiny.*

Keywords: *Tax avoidance, Industry 4.0, Value Chain Analysis, Tanzania.*

Paper Type: *Research article.*

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1. Introduction

The pace of 4th Industrial Revolution (aka Industry 4.0) is generating a novel business processes while eliminating operational bottlenecks towards new level of optimisation and sophisticated productivity necessitating revolutionary approach of tax techniques. Industry 4.0 pushes global taxpayers to not only advanced level of sophisticated investment decisions, but also significant expansion of value chain models (Solovyova, 2019; Keen, *et al.*, 2015).

Henceforth, Industry 4.0 acts as game-changing impact through dramatically altering philosophies and strategies on taxation loopholes in sophisticated value added activities. In general, Industry 4.0 provides loopholes, weaknesses, deficiencies and loose or vague clauses tax liability but its impact is silently ignored (Zervoudi, 2020; Gianmarco *et al.*, 2018; Nagy, 2018).

In the current climate of economic crisis, governments are implementing budget cuts in an effort to cope with national debts and aftereffects of COVID 19 as a whole, in essence, governments have to raise revenue by fighting tax evasion and expanding tax base (AfDB, *et al.*, 2010; Gianmarco, *et al.*, 2018). Issue of raising revenue through taxes is especially important given the short-term nature of donor assistance, which does not guarantee sustainable development for Africa (AfDB, 2010).

However, around the globe different initiatives have been taken to protect the fairness of the global tax system and secure revenue streams for governments because tax avoidance inflict fiscal destabilisations and sometimes life-threatening consequences on millions of individuals (Kassa, 2021; G-20 Development Working Group, 2011).

Consequentially, due to sophisticated value addition processes whilst revenue originated from multiple sources, with value chain growing agile in the avenue of demand economy, and so fragmenting domestic resource mobilisation. This problem stimulate a concern for tax avoidance, because ability to gather information from physical world, to process it and based on outcome allow a computer-based system to make decisions instead of people, is revolutionising the world's economy (Gružauskas and Statnickė, 2017).

On realising these benefits, however, necessitate profound transformation in tax collection models, from reactive value added chains to proactive. Proactive tax rules anticipate and speedily respond to dynamics of value addition and revenue through complementary products and services precipitated in Industry 4.0 which expound unclear taxation practices.

The coexistence of taxation loopholes in sophisticated value added transactions and low tax revenue collection due to Industry 4.0 raises the question about a potential link between ineffective domestic resource mobilisation and underdevelopment in

developing countries. For instance, the Organisation for Economic Cooperation and Development (OECD) estimates that Africa loses \$50 billion to tax evasion annually while the United Nations Economic Commission for Africa (UNECA) estimates that \$100 billion is lost.

In addition, the United Nations Conference on Trade and Development (UNCTAD) found that a wide financing gap (Difference between the amount needed to achieve Sustainable Development Goals (SDGs) and actual government revenue) of \$210 billion. Evidencing, the rate of change of tax avoidance is higher in comparison to speed of domestic resource mobilisation in Industry 4.0 and can be termed as a quasi-steady problem in developing countries.

In this study, tax avoidance is viewed as a process whereby an individual plans to reduce taxable income by playing within the legal parameters allowed by tax laws of the country (OECD 2021; Rogers-Glabush, 2009; Slemrod and Yitzhaki, 2002). Having tax rules in complicated value-added transactions, it can be challenging to arrive at appropriate classification for such sophisticated transfer pricing transaction causing difficulties to ascertain applicable taxation rules (Cho *et al.*, 2021; Shrivastava and Gupta, 2004).

Also, the process for determining correct tax ascertainment can become significantly more complex when a tax system is dealing with a fluid pool of suppliers, in additional jurisdictions with differing rules (e Hassan *et al.*, 2021; Musimenta, 2020). In such sophisticated value adding transactions and existence of loopholes in taxation systems, when transactions are planned to avoid paying taxes, tax avoidance shifts tax burden from the evasive and unethical individual to honest low income earning citizen!

The Fourth Industrial Revolution, however, brings new industrial strategies are based on value added revenue, in tax systems are no longer fit for the age of predictive maintenance, artificial intelligence, internet of things, big data, smart factories, automation and robotics are rules of the day (Sima *et al.*, 2020; Gianmarco *et al.*, 2018; Bahrin *et al.*, 2016). Despite of importance of value chain analysis on exposing tax avoidance in the success of Industry 4.0, a few pieces of research have been conducted on that area. For example, the USAID Economic Governance Program (2020) has presented analytical methods for systems approach policy on value chain analysis but on tax dispute resolution reform.

In fact, from USAID Economic Governance Program (2020), the present study accrues and will extend its empiricism in two directions: firstly, assumption of tax disputes across the value chain is a symptom of fragile tax rules and systems. Thereby, tax rules and systems under Industry 4.0 are now arbitrary. Secondly, tax avoidance on taxable transactions is impractically hidden on sophisticated transactions in Industry 4.0. Henceforth, effects of decrease in domestic resource mobilisation due to Industry 4.0 amplified by tax avoidance will be framed in the

present study. In this regard, through adoption of philosophy of Glenday *et al.* (2018), this study will examine value chain analysis in tax avoidance on Industry 4.0 in Tanzania.

2. Literature Review and Hypothesis Development

This section will study relevant studies about Value Chain Analysis and studies regarding the relationship between Industry 4.0 and Tax Avoidance. Variables conceptualized in the framework are inferred from the extant literature available on the issue.

2.1 Value Chain Analysis

Value chain analysis is an appreciative way of understanding how tax avoidance collectively impact tax collection models in Industry 4.0. It provides a perspective on how Industry 4.0 contributes to the process of adding value to a product or service. As a framework for developing tax collection models in Industry 4.0, value chain analysis has several distinct characteristics.

Both the dissecting of activities and the synthesis of activities provide insight, detail, and an overall perspective. This results, *firstly* in an emphasis on mapping source(s) of tax avoidance in Industry 4.0; *secondly* a way to identify the linkages and interrelationships between activities which create value in Industry 4.0; and *thirdly*, a focus on the tracking of tax avoidance strategies in Industry 4.0.

This results, *firstly* on way to identify the linkages and interrelationships between activities which create value in Industry 4.0; *secondly* emphasising on mapping source(s) of tax avoidance in Industry 4.0; *thirdly*, a focus on the tracking of tax avoidance strategies in Industry 4.0; *fourthly* understanding interactions within value chain in Industry 4.0 to identify enabling environment that influence tax avoidance; *fifthly*, analyse contribution and relationships of different chain actors involved on tax avoidance strategies in Industry 4.0; and *sixthly*, shape and control the tax ecosystem by integrating actors, infrastructure, policies, regulations, institutions and processes with Industry 4.0's in value chain.

Academicians such as Liu (2020), Khan *et al.* (2019), Shin and Park (2019), Guo (2014) studies on the relationship between tax avoidance and change in technology in the context of developed and developing nations, yet there is a need to undertake further studies to understand the relationship between Tax Avoidance and Industry 4.0 particularly in the context of Sub Saharan Countries such as Tanzania. Consequently, investigating more on the nature of this relationship is worthy.

Therefore, the following proposition was formulated:

Proposition 1: Tax Avoidance has negative effect on Industry 4.0.

Value chain analysis has rarely been applied to understand either Value Network Analysis or Value Chain Governance in Industry 4.0, two important representations of Tax Avoidance in Industry 4.0, although its basic arguments suggest line of reasoning normal tax ascertainment mechanisms can provide only partial understandings of fragile tax rules and systems in Industry 4.0.

Among large number of literatures related to Tax Avoidance and Industry 4.0, only limited number of these studies investigated the phenomenon in Tanzania. It is worth to mention studies such as Alstadsæter *et al.* (2019); Kundeliene *et al.* (2021) in tax avoidance risk in the context of digitisation; Ioana-Florina and Mare (2021) in tax avoidance behaviour on intelligent decision technologies and Lismont *et al.* (2018) in tax avoidance on social network analytics.

Thus, more studies are needed to investigate the relationship between Tax Avoidance, Value Network Analysis and Industry 4.0 and to fill the literature gap. Based on this assumption, the following proposition was formulated:

Proposition 2: Value Network Analysis mediates the effect of Tax Avoidance on Industry 4.0.

2.2 Value Network Analysis

Network analysis in tax avoidance is a set of integrated techniques depicting relations among tax avoidance actors involving analysis of social structures that emerge from the recurrence of these relations (Antony and Hudiwinarsih, 2018; Lanis and Richardson, 2015). Value networks are composed of sets of nodes and links, and their distinctive feature is the complementarities between these nodes and links (Peppard and Rylander 2006).

Networks are made up of specific roles and value relationships inclined towards achieving a specific outcome (CFI, 2020). Nodes represent specific roles and interactions of individuals working in an organised system while the links indicate linkage of value creation relationships and the associated resources (Kowalski and Jenkins, 2015; Mircea and Cosmin, 2008).

Among large number of literatures related to Tax Avoidance and Industry 4.0, only limited number of these studies investigated those phenomenon in Tanzania. It is worth to mention studies such as Alstadsæter *et al.* (2019); Kundeliene *et al.* (2021) in tax avoidance risk in the context of digitisation; Ioana-Florina and Mare (2021) in tax avoidance behaviour on intelligent decision technologies and Lismont, *et al.*, (2018) in tax avoidance on social network analytics.

Value Network Analysis (VNA) in tax avoidance provides a map that actors can use to shape their strategies to seize opportunities of tax avoidance in the Industry 4.0. In this way VNA ascertain actors' relationships and complementary resources in

Industry 4.0 to realize, *firstly*, where value cheating in tax avoidance occurs and how it is co-created; *secondly*, how the specific roles and value relationships of an actor would result to tax avoidance and *thirdly*, how other actors in the network are likely to respond. Thus VNA, not only map the direct relationships and resource complementarities, specific roles and value relationships but also map linkage of value creation relationships and the associated resources.

Value Network Analysis is important in understanding value networks described by nodes and the relationships between those nodes whereby relationships are seen in terms of either tangible or intangible benefits between the nodes. As per the best knowledge of the researcher, the studies concerning VNA has not been used before to mediate the relationship between Tax Avoidance and Industry 4.0 and in the context of Tanzania especially in the Sub-Saharan Countries.

Thus, more studies are needed to investigate importance of NVA in understanding relationship between Tax Avoidance and Industry 4.0 and to fill the literature gap. Based on this assumption, the following proposition was formulated:

Proposition 3: Value Network Analysis mediates the effect of Tax Avoidance on Industry 4.0

2.3 Value Chain Governance

In reducing tax avoidance in Industry 4.0, an attempt is made to excessive rely on laws, policies and regulations. However, excessive controls on administrative and personnel systems can become controversy, unresponsive and inflexible, thereby increases opportunities for tax avoidance in Industry 4.0.

This means, some efforts of value chain governance have been strikingly effective in reducing tax avoidance, while in some cases have had tiny gain, have exhausted scarce resources and opportunities, or have done more injury than good.

The nature of tax avoidance in Industry 4.0, calls for increased governance structures, advocated most prominently by tax activists, has revolved around accountability, transparency, responsiveness, rule of law as a possible corrective measure. Value chain governance represents the norms, values and rules of the game through which public affairs are managed in a manner that is transparent, participatory, inclusive and responsive in value creation processes. In that manner, value chain governance set the parameters under which administrative systems will operate in Industry 4.0.

Value chain governance represents the norms, values and rules of the game through which public affairs are managed in a manner that is transparent, participatory, inclusive and responsive in value creation processes. Value chain governance usually set parameters under which administrative and procedural control systems

will operate in value creation activities. One of the concerns often expressed in tax avoidance is the way in which Industry 4.0 can be integrated into value chain governance.

However, to the best of this researcher, there are limited studies that have examined the mediating role of Value chain governance in the relationship between Tax Avoidance and Industry 4.0 in general and especially in the context of Tanzania. Value chain governance explains the importance of identifying governance structures, dynamism of interactions caused by changes in market conditions, technologies, policies and coordination of activities along value chains.

Therefore, adding Value chain governance as a mediating variable in the model of this study will aid in understanding effect of Tax Avoidance on Industry 4.0. On this score, the present study argues that Value chain governance will have a theoretical mediating effect in predicting and reducing Tax Avoidance in Industry 4.0. Based on this assumption, the following proposition was formulated:

Proposition 4: Value Chain Governance mediates the effect of Tax Avoidance on Industry 4.0.

3. Proposed Conceptual Framework

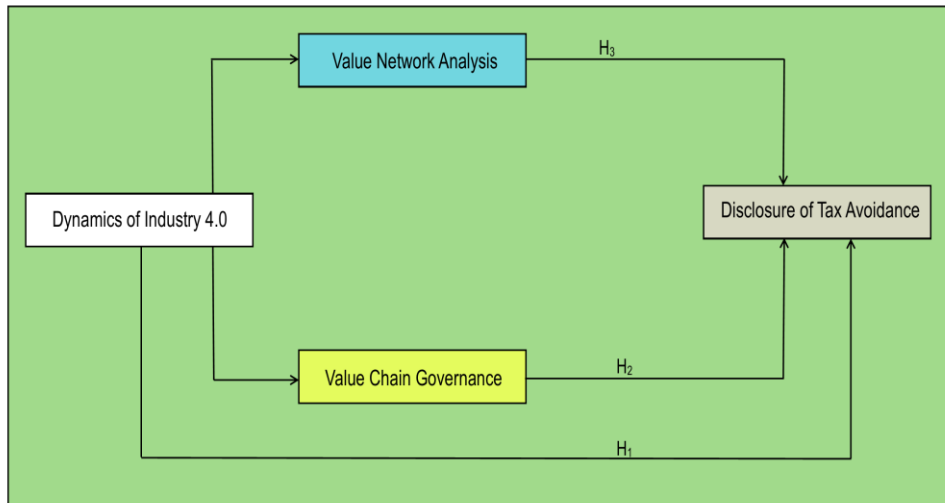
Given below Figure 1 shows the initial research conceptual framework which has been developed based on the extent studies to examine Tax Avoidance in Industry 4.0. Value chain analysis is an operational tool used to provide the right information in the right format at the right time to the right stakeholder.

The aim of value chain analysis is to increase operational efficiency to realise maximum value for the least possible cost even in complicated value-added transactions.

However, value chain analysis has rarely been applied to understand complicated value-added transactions through Value Network Analysis or Value Chain Governance in Industry 4.0, two important representations of Tax Avoidance in Industry 4.0, although its basic arguments suggest line of reasoning normal tax ascertainment mechanisms can provide only partial understandings of fragile tax rules and systems in Industry 4.0.

This paper significantly contributes to the previous literature by developing a conceptual framework as shown in figure1 that hypothesized the direct effect of the Tax Avoidance in Industry 4.0. Furthermore, this paper proposed the investigation of the mediating effect of Value Chain Analysis on the relationship between Tax Avoidance and Industry 4.0 to bring more insights into normal tax ascertainment mechanisms specifically in Tanzanian context.

Figure 1. The initial research conceptual framework



Source: Author's Construction

4. Research Methodology

This paper offers a proposed conceptual framework for Tax Avoidance in Industry 4.0. The researcher proposes a quantitative approach to test the moderating effect of Value Chain Analysis on Tax Avoidance in Industry 4.0. The approach will describe the relationship between the independent and dependent variables under study to enable the researcher to identify the mediating effect of Value Chain Analysis on Tax Avoidance in Industry 4.0.

The population of this study is full-time employees working in Industry 4.0. The sample is made up of manufacturing and service firms which belong to IT-intensive sectors due to the weight of their electronic business activities. The survey questionnaire will be distributed among the targeted respondents to collect important data. The measurement will be adapted from existing literature. The population for the study comprised tax officials and consultants, electronic manufacturing and service companies in Tanzania.

However, the unit of analysis for this study electronic manufacturing and service companies in Tanzania. To test the proposed model, the Structural Equation Modeling - Partial Least Square (SEM-PLS) to examine the structural component of the measurement and the structural model.

5. Conclusion

As mentioned above, this study aimed at examines effect of Value Chain Analysis on Tax Avoidance in Industry 4.0. By providing empirical evidence on the study's

proposed constructs, this research is expected to evidence on coexistence of taxation loopholes in sophisticated value added transactions and low tax revenue collection due to Industry 4.0 in developing countries.

In the previous studies, researchers have tried to link ineffective domestic resource mobilisation and underdevelopment, but they have ignored the role of Value Chain Analysis on Tax Avoidance as a vital predictor of taxation loopholes in sophisticated value added transactions. The main concern of speeding domestic resource mobilisation in Industry 4.0 is to prevent taxation loopholes. The better way of doing that is to prevent the level of Tax Avoidance on sophisticated value added transactions to Industry 4.0.

Thus, the addition of Value Chain Analysis as a mediator in the relationship between Tax Avoidance and Industry 4.0 will help in minimizing Tax Avoidance on one hand and provide a better understanding of the relationship between the of taxation loopholes on the other hand.

6. Research Limitation and Direction for Future Research

This paper proposes a conceptual framework to examine effect of Value Chain Analysis on Tax Avoidance in Industry 4.0. Whilst this study is centered on developed hypothesis, there are few unavoidable limitations around scope and scale. First, research can be generalised only to the diversity of SMEs and large companies, since, due to limited time and resources, data were collected only from SMEs.

With respect to the research method, only the quantitative method was used in this study, in future researchers can potentially use mixed-method to test the model and thus support and build upon its findings. This paper proposed to examine the Tax Avoidance affecting the Industry 4.0 directly and indirectly through the mediating role of Value Chain Analysis without considering the demographic factors such as age, experience, and level of education of the respondents.

Also, research can be generalised only to the diversity of SMEs and large companies, since, due to limited resources, data will be extensively collected only from SMEs. With respect to the research method, only the quantitative method will be used in this study, in future researchers can potentially use mixed-method to test the model and thus support and build upon its findings.

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