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Differential Transaction Costs in Vertically Integrated Greenleaf Tea Market in Southern Highlands, Tanzania

Finias Dogeje
ORCiD: https://orcid.org/0009-0006-1345-9461
Centre for Economics and Community Economic Development, The Open University of Tanzania
Email: finias.dogeje@gmail.com

Prof. Deus Ngaruko, PhD
ORCID: https://orcid.org/0000-0001-7009-1081
Centre for Economics and Community Economic Development, The Open University of Tanzania;
Email: ngarukoddp@gmail.com

Abstract*:* This paper quantified differential transaction costs associated with farmers' participation in a vertically integrated green leaf tea market in Tanzania. The study used descriptive research design, and employed a cross-sectional survey to collect data from 393 smallholder tea producers from three districts in Southern Highlands Tanzania. A structured close ended questionnaire was used to collect data. Data analysis was done using the IBM SPSS Statistics Version 26. Reliability and validity test resulted in acceptable threshold of average of 0.882 Cronbach's Alpha and above 0.7 factor loading for transaction cost indicators. Paired samples t-test was used to test the null hypothesis. The results show that downward transaction cost is statistically higher than upward transaction cost (p=0.000). The higher downward transaction cost indicates that smallholder tea growers may face substantial constraints while participating in vertical integration, specifically in contracting farming and predominantly in the lower node of the tea value chain. This, entails activities linked to pre-harvest practices like land preparation and tea agronomic practices. To enhance Greenleaf tea vertical integrated market participation, production output, income and farmers' livelihood, the study recommends that policymakers and practitioners evaluate differential impact of transaction costs at various levels of the tea value chain, focusing on downward transaction cost variables experienced by contract farmers and subsequently devise mechanisms, strategies and policies to reduce those costs.

Keywords: Downward transaction cost; upward transaction cost; vertical integration; vertically integrated market; Greenleaf tea market; contract farming.

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Introduction

Vertical integration theory sits at the crossroads of contract, market and firm theories. A firm is regarded as vertically integrated if it has two single-output production processes, with the output of one being an intermediate input. The rationale for vertical integration may be associated to various factors, including transactional, market flaws and technological economies (Dongoski, 2019; Perry, 1989).

The essence of vertical integration is to merge different firms into a united production and distribution complex, whereby each business focuses on a single production function, resulting in a unified and competitive organisation (Inobat, 2018). Vertical integration in agriculture occurs when a firm joins up with another firm or entity

from which it either gets inputs or it sells its output (Hendrickson et al., 2018; Rehber, 1998). In this sense, if getting production inputs from the market is more expensive than creating them, the investor may consider vertically integrating into input production (Dongoski, 2019; Rehber, 2007). According to Rehber (1998), vertical integration in agriculture may be categorised into four major types, namely, contract farming, coordination without any contract, farmer cooperatives and ownership integration. This study focused on analysing and contrasting different transaction costs across the agri-value chain nodes with a focus on contract farming as a form of vertical integration.

Contract farming, as a type of vertical coordination, seeks to address market inefficiencies found in spot markets resulting from inadequate information (Akumu et al., 2020). This form of vertical integration is becoming increasingly popular among agribusinesses and smallholder farmers around the world (Anh et al., 2019). It has proven to be a beneficial technique for collaboration between farmers and agribusiness corporations with a common goal of minimising the risks associated with producing and marketing various goods. Furthermore, it aids farmers in overcoming such production challenges as access to extension services, inputs and production technologies like irrigation and mechanisation (Anh et al., 2019; Arouna et al., 2021).

Vertical coordination has been employed as a pre-harvest agreement between smallholder farmers and purchasers in different established and developing countries such as the United States, Georgia, Moldova, Armenia, Russia, Ukraine, Vietnam, India, Belgium and Thailand (Meemken & Bellemare, 2019; Prowse, 2016). Concomitantly, high numbers of corporate farms use vertically coordinated market in Europe's Czech Republic, Slovakia, and Hungary. The proportion of food corporations using contract farming as a form of vertical coordination has expanded rapidly (Swinnen & Maertens, 2007). Similarly, this form of vertical coordination has spread rapidly throughout Latin America, particularly in Mexico, Brazil, Peru and other countries. Malaysia, Indonesia, Vietnam, India, China and Pakistan have all used contract farming as a form of vertical coordination in various agricultural areas.

Contract farming has increased in Sub-Saharan Africa since the 1980s, and many initiatives are now being initiated by commercial entities. In vertically coordinated markets, contract farming is estimated to be practised by 12% of Mozambique's rural population and it accounts for 60 percent of Kenya's sugar and tea production (Rehber, 2007; FAO, 2005). Farmers' involvement in contract vertically integrated markets, such as contract farming vary across value chains in Tanzania, with certain crops demonstrating greater farmer involvement than others. According to a URT (2016) survey, 75 percent of sisal farmers and 49 percent of sugarcane producers assigned their land to vertical integration. Meemken and Bellemare (2019) discovered that Tanzanian farmers participate in vertical integration at a rate that exceeds 70 percent, revealing significant disparities in participation levels within and outside of Tanzania. This disparity suggests that the prevalence of contract farming and vertical integration can vary widely based on crop types, countries and regional contexts, all of which influence the level of farmers' involvement in these coordinated markets.

Tea is an important cash crop in Tanzania, supporting over 2 million people indirectly and directly employing approximately 50,000 people. Tea is grown by around 32,000 smallholder farmers on small farms totaling less than 3.5 acres. Tanzania's tea industry earns around 45 million USD in foreign exchange per year, with smallholder tea producers in some regions having farms averaging less than 3 acres in size (IDH, 2021a, 2021b; URT, 2023). According to Section 40 (1) of the Tanzania Tea Regulations 2010 (URT, 2010), smallholder farmers are encouraged to market their green leaf tea through vertical integration, specifically through contract farming. Furthermore, some tea growers in various tea-growing locations do not produce or sell tea through contract farming. According to evidence from a literature analysis, contract farming as form of vertical integration is somewhat utilised by smallholder tea growers in the districts studied (Rungwe, Busokelo, and Njombe). According to IDH (2021a) and IDH (2021b), around 52 percent of the 6,147 farmers who supplied green leaf tea to the Ikanga Tea Factory in Njombe, for example, took part in annual sourcing contracts while 48 percent were not involved.

Connectedly, several studies consider transaction cost as a major factor determining farmers' participation in vertically coordinated markets. However, there is insufficient evidence on transaction cost classification and quantification

with a focus on contract farming involvement with a focus on typical cash crop value chains such as coffee and tea. Previous research concentrated on grouping and establishing effect of total transaction costs while not giving much attention to the unique transaction costs incurred at various levels of the value chain. Numerous studies in various countries like Bangladesh, Vietnam, Zimbabwe, Benin, Ethiopia, Kenya and Tanzania have found that factors such as information search, negotiation, enforcement, payment delays and side selling have a significant impact on farmers' involvement (Taslim et al., 2021; Chazovachii et al., 2021; Tuyen et al., 2022; Arouna et al., 2021; Yeshitila et al., 2020; Ngaruko & Lyanga 2021). Our argument is that without a diligent emphasis on transaction costs, it may be difficult to considerably reduce transaction costs, resulting in farmers operating outside the vertical integrated market system and therefore missing its potential benefits. This study focused on categorising and measuring transaction costs for farmers participating in contract farming as a form of vertical integration across Tanzania's tea value chain nodes.

Literature Review

Various authors conceptualized transaction costs differently in the agricultural value chain. For example, Williamson (1979) and Coase (1937) divided vertical integration transaction costs into three categories: search costs (finding partners), bargaining costs (negotiating agreements) and enforcement costs (enforcing compliance). This classification can aid in understanding the difficulties and costs encountered during contract discussions and implementation, resulting in more efficient and successful vertical integration arrangements in general. Likewise, Fafchamps and Hill (2005) categorised agricultural transaction costs into three categories: farming-related costs, search costs (finding buyers) and negotiation costs (bargaining with buyers). Their classification provides vital insights into issues that farmers and buyers experience in agricultural exchanges, allowing for enhanced market efficiency and regulatory solutions.

On the other hand, Holloway et al. (2000) divided transaction costs into two categories: tangible (communication and transportation costs) and intangible (risks and uncertainties). Furthermore, Key et al. (2000) distinguished between transaction costs that are variable or proportional (Input transportation) and fixed (negotiating and enforcement costs). In a different perspective, Lijia and Xuexi (2014) and Key et al. (2000) distinguished between observable transaction costs (transport, handling, spoilage, and storage) and unobservable costs, which include fixed or intangible transaction costs such as information search costs, negotiation costs and contract enforcement costs. This finding suggests that identifying transaction costs in this context can assist farmers appreciate the obstacles and expenses they experience in such contractual arrangements. In contrast, Pingali et al. (2005) analysed transaction costs based on physical location; consequently, input costs and market access costs fluctuate depending on the farmer's location. They further reported that because vegetables are perishable, they have greater transaction costs than cereals and cash crops.

Further to transaction cost classifications, various scholars studied the impact of transaction cost on farmers' participation in vertical integration. For example, according to Kozhaya (2020), payment and delivery delays as well as side selling owing to market price changes, have a detrimental impact on vertically coordinated market efficacy in Lebanon. Tuyen et al. (2022) discovered that factors such as delayed payments and late delivery affect vertical integration performance in Vietnam, whereas Rokhani et al. (2020) discovered that access to extension services is a positive determinant of farmer participation in Indonesia. On the other hand, Chazovachii et al. (2021) revealed that information asymmetry and negotiation ambiguity have a detrimental impact on participation in Zimbabwe, emphasising the importance of information search and contract negotiation costs.

Likewise, a study undertaken by Arouna et al. (2021) on the association between vertical coordinated market and rural transformation in Benin revealed that the simplicity or complexity of contracts has no effect on farmers' participation in contract farming as a form of vertical coordination. The associated expenses may be related to the time spent searching for contract information (information search) transaction costs. However, studies conducted in Tanzania on farmers' participation in vertically coordinated market by various scholars such as Mmbando et al. (2016), Ngaruko and Lyanga (2021), Msami and Ngaruko (2014) and Ismail et al. (2015) concluded that various transaction costs such as information search, negotiation and enforcement or policing, significantly affect farmers' participation

in vertically coordinated markets such as contract farming.

The studied literature draws significant precedence regarding transaction cost classification in multiple dimensions and its implication on participation in vertically coordinated markets. However, by focusing on individual nodes of a typical cash crop value chain, there is currently a gap in the classification and quantification of different forms of hidden transaction costs in relation to farmers' participation in contract farming. This study sought to close this gap by identifying and quantifying the transaction costs experienced by farmers when participating in contract farming in the tea value chain in Tanzania, utilizing a nuanced approach that focuses on the upstream and downstream value chain nodes in particular.

This study drew on conflicting transaction cost classifications reported in Pingali et al. (2005) which focused on a specific agri-value chain and Key et al. (2000)'s assessment of intangible transaction costs. This study categorizes and quantifies transaction costs with an emphasis on agri-value chain nodes (upward and downward transaction costs) with a focus on transaction costs associated with farmers' participation in vertical integration.

In the context of this study, downward/backward transaction costs are hidden costs associated with crop production in vertically integrated marketing arrangements, such as farm preparation, planting, and management (growth). In contrast, upward/forward transaction costs are the hidden costs associated with crop selling within vertical integration agreements, such as harvesting (plucking), aggregation, sorting, shipping, and sale. Moreover, this study used Coase's (1937) and Williamson's (1979) major types of transaction costs, information search, negotiation and contract enforcement costs, to identify and quantify transaction costs in each of the two categories (downward and upward transaction costs). By classifying and quantifying transaction costs across the tea value chain nodes, tea value chain actors gain insights into the transaction costs dynamics, making it easier to develop targeted solutions to lower the same and therefore improve participation in vertically coordinated markets such as contract farming.

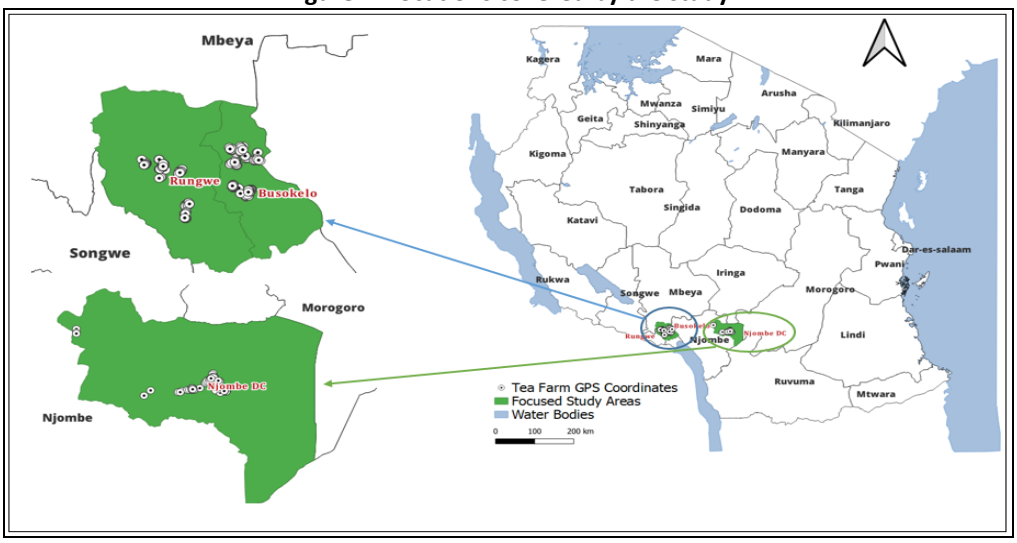
Methodology

This section provides an outline of the research design used, the study area, sampling procedures, variable measurement and data analysis framework.

Study Design

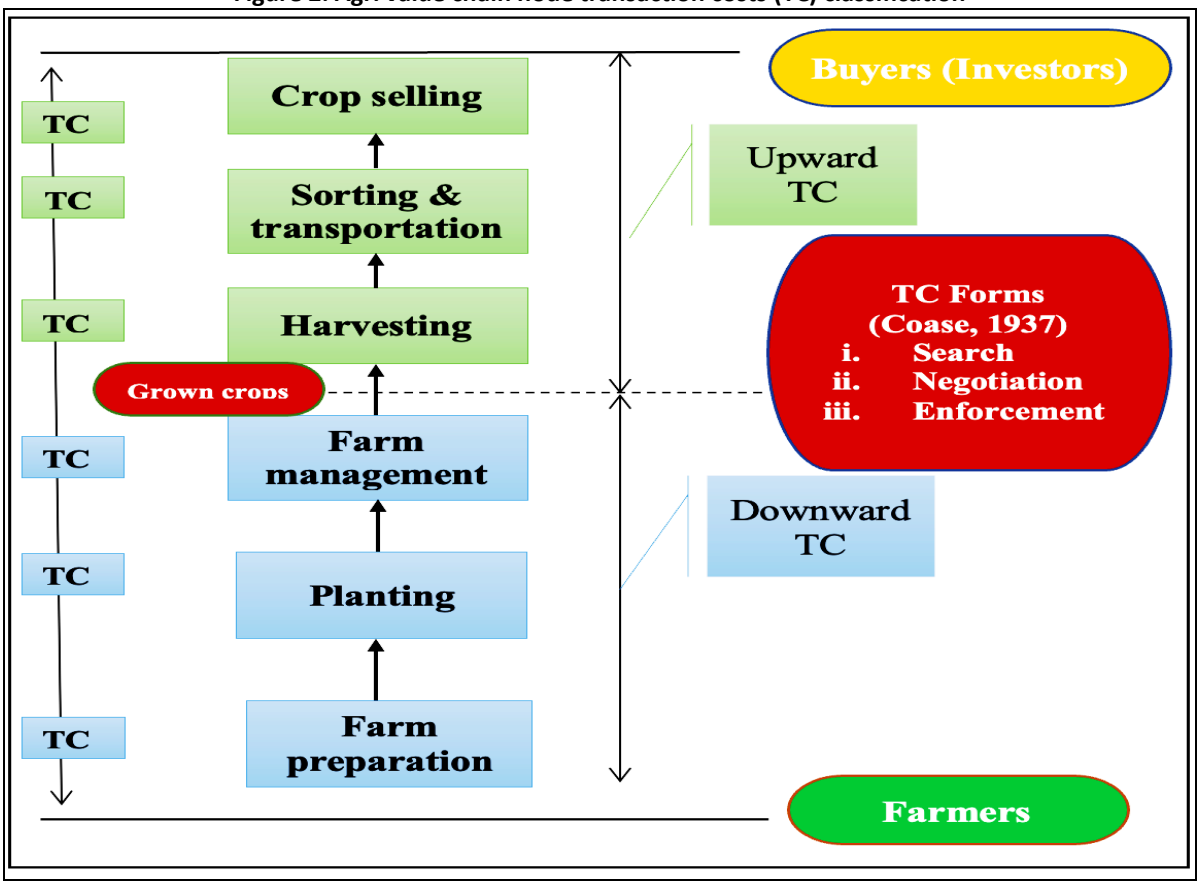
This study employed a descriptive study design and it specifically used a cross-sectional survey which, enabled systematic collection, analysis and interpretation of data from Greenleaf tea producers in select Tanzania's Southern Highlands Districts (Buskokelo, Rungwe and Njombe District Council). Descriptive design is valuable as it offers insights into the behaviours, patterns and attitudes within the examined population, thereby establishing basis for hypothesis testing (Siedlecki, 2020). This approach helped the researchers to quantify differential transaction costs associated with the vertically integrated Greenleaf tea market across various value chain nodes in Tanzania's tea subsector, and forming a basis in hypothesis testing in line with research questions.

Figure 1: Locations covered by the study



Source: Researcher Construct, 2023

Figure 2: Agri value chain node transaction costs (TC) classification



Source: Researcher Construct, 2023

Sampling Procedure and Study Area

This study used primary data from a cross-sectional survey of 393 smallholder tea farmers from 37 villages who were chosen based on their participation or non-participation in vertically coordinated Greenleaf tea market during the 2022 tea producing season from three districts in Tanzania's Southern Highland, specifically Rungwe and Busokelo in Mbeya region and Njombe District Council in Njombe region. Data collection was purely quantitative by using a structured questionnaire. To maximize representation, stratified cluster sampling was used. Participants were separated into contract and non-participants (70% and 30%, respectively), with random samples collected from specified clusters, precisely from the 37 villages chosen based on the availability of farmers participating or not participating in vertically coordinated Greenleaf tea market. The specific locations covered by this study are potted in Figure 1.

Variables Measurement

Farmers' engagement in vertically coordinated Greenleaf tea market was measured as a binary variable (1 if participated, 0 otherwise). Conversely, the study employed two independent variables (downward transaction costs (DTC) and upward transaction costs (UTC). This classification was adopted based on the understanding that tea value chain entails various activities which might have different transaction cost implications. DTC concentrated on the transaction costs experienced by smallholder tea farmers during various operations in the tea value chain's downstream stream, particularly crop production in the context of vertical integration. Examples of the downward stream transaction cost, include farm preparation, planting and management (growth). Conversely, UTC represents the transaction costs incurred by smallholder tea growers during various activities in the tea value chain's upward stream, notably crop selling. The upward stream activities include harvesting (plucking), aggregation, sorting, and selling. The study further employed Coase's (1937) three main transaction costs; information search, bargaining and enforcement to further categorise transaction costs within the tea value chain nodes' downward and upward continuum. *Figure 2* shows how transaction cost related with farmers

participation in vertical integration are classified. Both DTC and UTC were measured on a five-point Likert scale (1–5). Each variable had three constructs and three indicators, for a total of six constructs (3 for DTC and three for UTC) and twenty-four indicators (12 for DTC and 12 for UTC). The Likert scale, which was utilised as a proxy indicator, enabled for the quantification of farmers' views and opinions on transaction costs, allowing for more focused data analysis and interpretation. Based on their viewpoints and experiences, participants scored 24 items (12 for DTC and 12 for UTC). Details are shown in Tables 1 and 2).

Table 1: Measurement of Downward Transaction Costs

Vertical integration stage	Construct	Transaction cost indicator
Production {Farm preparation, planting, and management (growing)}	DSTC	DSTC1: Contract length DSTC2: Time used to know the contract terms DSTC3: Cost to know contract opportunities and terms DSTC4: Visiting frequency to the investor
	DNTC	DNTC1: Contract terms rigidity DNTC2: Contract negotiation frustration DNTC3: Time to understand contract terms DNTC4: Comprehension of the contract terms
	DETC	DETC1: Delays in receiving the agreed services DECT2: Reputation of not complying to contract DECT3: Time use in contract monitoring DNCT4: Fear of legal reprisal production techniques non-compliance

Table 2: Measurement of upward transaction costs

Vertical integration stage	Construct	Transaction cost indicator
Selling {harvesting (plucking), aggregation sorting and selling}	USTC	UTSC1: Frustration to know harvesting and collection dates UTSC2: Visits to the buyer (investor) to know net amount payable UTSC3: Cost to know net amount payable UTC4: Time spent to wait for payment status
	UNTC	UNTC1: Price-renegotiation in case of market changes UNTC2: Frustration with re-negotiation price UNTC3: Time used to understand revised price setting mechanism UNTC4: Frustration in agreeing on the net amount to be paid on the acceptable quality supplied
	UETC	UETC1: Delays in payments UETC2: Loss due to quality-based products rejection UETC3: Product inspection time UETC4: Side-selling penalty

To assess how various transaction expenses in vertical integration along the tea value chain were regarded generally, composite scores were produced for each of the six constructs. Measures of central tendency, specifically maximum, minimum, mode, median, mean and range values, and standard deviation, were calculated using these scores. Each composite score was divided into two mean groups, one labelled "low transaction cost" and the other "high transaction cost." This method, as shown in Table 3, was developed from Ngaruko's (2022) earlier research.

Data Analysis

Data was cleaned using Microsoft Excel. The cleansed data was then imported into the IBM SPSS Statistics Version 26 for Mac for analysis. To improve the understanding of the data, the analysis included descriptive assessments of the transaction cost variables across the tea value chain node. A paired sample t-test was used to test the null hypothesis that there is no difference between upward and downward transaction cost in the vertically integrated green leaf tea market in Tanzania. The test enabled the researchers to examine differences among farmers in the same group, eliminating

individual variances. The researchers were able to assess whether the observed differences in transaction costs were statistically significant by examining the p-value obtained from the test. A p-value lesser than or equal to 0.05 would lead to the null hypothesis being rejected, showing that there are significant differences in the value chain's downward and upward transaction costs. Conversely, the null hypothesis is considered if it is otherwise, i.e., at high p-value greater than 0.05.

Validity and Reliability

Before being used in this study, the data collection tool was peer reviewed and piloted. The pilot, which was not part of the main study, engaged 103 smallholder tea producers in the Mufindi District in Iringa region to ensure the tool's clarity. The convergent and divergent validity of the 24 transaction cost indicators used in this study were confirmed across six constructs (3 for DTC and 3 for UTC), by using Exploratory Factor Analysis (EFA), with factor loadings over 0.75, where all 24 transaction cost factors loaded effectively onto their respective constructions, which is above the acceptable threshold of 0.7 (Fabrigar & Wegener, 2011). The reliability assessment of the six transaction constructs produced composite scores with the Cronbach's alpha values greater than 0.8 while the average Cronbach's alpha value was 0.882. This Cronbach's alpha value is beyond the acceptable threshold of data reliability which is 0.7 (Pallant, 2016).

Ethical Considerations

In this study, ethical considerations were a major focus. This entailed protecting participants' rights, well-being and dignity while maintaining the study integrity. Following research ethical rules, clearance letters were secured from the Open University of Tanzania's Directorate of Post-Graduate Studies, and acceptance letters were obtained from the three study districts. Respondent confidentiality was ensured by employing unique identification numbers (IDs) rather than names, and data were securely kept in a password-protected KoBo database. Verbal consent was obtained, ensuring voluntary participation without coercion. After careful thought, participants were free to decide whether or not to participate.

Results and Discussion

This section presents the results and discusses the findings related to the study on differential transaction costs in the vertically integrated Greenleaf tea market in the Southern Highlands of Tanzania, focusing on Busokelo and Rungwe in the Mbeya region, as well as Njombe District Council in the Njombe region.

Research Question 1: Do transaction costs vary across tea subsector value chain nodes in Tanzania?

The results in this section sought to answer the research question: Are there significant variations in transaction costs among different value chain nodes in the tea subsector of Tanzania? The study results show that smallholder tea growers view transaction costs associated with vertically coordinated markets to be rather high (See Table 4). The overall composite mean score of total transaction cost (TC) is roughly 74, which falls within the high-cost range of 72 to 120 (See Table 3). These findings highlight the significance of addressing transaction costs as potential impediments to farmers' participation in vertically coordinated markets.

Table 3: Composite scores data interpretation matrix

TC Classification	Variable	# of Indicators	Mean Score Measurement	Interpretation of Mean
DTC	DSTC	4	4-20	Low=4-11.9; High=12-20
	DNTC	4	4-20	Low=4-11.9; High=12-20
	DETC	4	4-20	Low=4-11.9; High=12-20
Total TDC		12	12-60	Low=12-35.9; High=36-60
UTC	USTC	4	4-20	Low=4-11.9; High=12-20
	UNTC	4	4-20	Low=4-11.9; High=12-20
	UETC	4	4-20	Low=4-11.9; High=12-20
Total UTC		12	12-60	Low=12-35.9; High=36-60
Total TC		24	24-120	Low=24-71.9; High=72-120

Source: Research Data, 2023

Delving into analysing the upward and downward transaction costs in table 4 reveals that the latter's mean value (41.5) exceeds the former's (32.2). This suggests that farmers consider the lower nodes of the tea value chain to be more difficult in terms of transaction costs and complexity. This finding is in line with other scholars like Ngaruko and Lyanga (2021) and Tuyen et al. (2022) who argued that

farmers face higher transaction cost when engaged in crop production and are likely to be affected while participating in commercial farming.

Within the downward value chain node, the Downward Negotiation Transaction Costs (DNTC) and Downward Enforcement Transaction Costs (DETC) were shown to be bigger than the Downward Search Transaction Costs (DSTC) (See Table 4). This suggests that farmers perceived that negotiation and enforcement transaction cost were relatively higher than search transaction in downward stream of the tea value chain. This implies that negotiation and enforcement transaction costs are likely to hinder farmers' participation in contract farming. This finding is in line with other studies, such as Chazovachii et al. (2021) who argued that higher transaction costs in contract enforcement like late delivery of agreed services like agricultural inputs, negatively influence farmers' participation in the vertically integrated market.

Relatively, only the Upward Enforcement Transaction Costs (UETC) were observed to outperform the Upward Search Transaction Costs (USTC) and Upward Negotiation Transaction Costs (UNTC) within the higher value chain node. This entails that in the upward value chain node, smallholder famers perceive contract enforcement transaction costs to be detrimental to their participation in vertically integrated markets such as contract farming. Therefore, upward search transaction cost is likely to negatively influence smallholder farmers' participation in vertically integrated markets. This reservation aligns with other studies which indicate that transaction cost like delayed payments and side selling are likely to negatively influence farmers' participation in the vertically integrated market (Kozhaya, 2020; Tuyen et al.,2022).

Table 4: Results of transaction cost descriptive analysis (n=393)

Variable		Min	Max	Mode	Median	Mean	Cost Category
DTC (Downward Transaction Cost)	DSTC	4	14	8	9	9.1	Low
	DNTC	12	20	16	16	16	High
	DETC	12	20	16	16	16.5	High
	Total DTC	**30**	**52**	**40**	**41**	**41.5**	**High**
UTC) Upward Transaction Cost	USTC	5	13	9	9	8.9	Low
	UNTC	4	20	10	10	10.3	Low
	UETC	5	20	14	13	13	High
	Total TUTC	**16**	**44**	**34**	**32**	**32.2**	**Low**
Total TC		55	91	79	74	73.8	High

Source: Research Data, 2023

To sum up, these observations emphasise the necessity of concentrating on transaction cost dynamics throughout the tea value chain, particularly at lower nodes, in order to promote fair and equitable outcomes for smallholder tea farmers and other stakeholders like tea buyers.

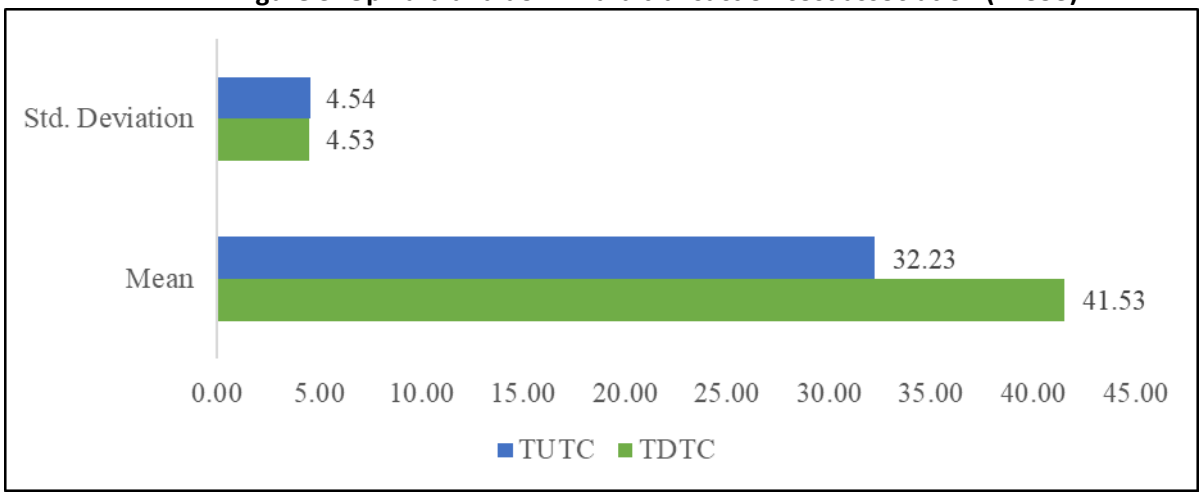
Research Question 2: Are there significant variations in transaction costs among different value chain nodes in the tea subsector of Tanzania?

The main goal of this research question was to establish whether there are significant variations in transaction costs among different value chain nodes in the tea subsector of Tanzania. In line with this research question, the study intended to test the null hypothesis that there is no significant difference between upward and downward transaction cost in the tea subsector in Tanzania, precisely in the vertically integrated Greenleaf tea markets. The findings show that when examining transaction costs with a focus on upward transaction costs (UTC) and downward transaction costs (UTC), the majority of farmers evaluated DTC to be generally higher than UTC. Figure 3 shows the composite mean scores for total downhill transaction cost (TDTC) (41.53) and total upward transaction cost (TUTC) (32.23) (TDTC > TUTC). The differences between TDC and TUTC are statistically significant at a precision level of 5%, supported by paired sample-t test results (p=0.000) (See Table 5). Therefore, the null hypothesis is not supported by these findings. Instead, the alternative hypothesis is considered, which is, there are differential transaction costs throughout the tea value chain nodes in Tanzania in connection to vertically coordinated markets. Precisely, the transaction cost related to farmers' participation in the vertically integrated market in the tea subsector are statistically higher in the downward value chain node compared to the upward value chain node.

These findings suggest significant variability in the mean values of these transaction cost variables, emphasising the necessity of evaluating the varied

impact of transaction costs at different levels of the tea value chain. High DTC shows that producers may experience significant constraints while in vertical integration with buyers, particularly in activities associated to the tea value chain's bottom node. This observation is consistent with previous research results by other scholars who found that high transaction costs in lower value chain node for instance, information asymmetry, negotiation ambiguity and delays in delivering the agreed services, are likely to reduce farmers' participation potential in vertically coordinated markets (Rokhani et al., 2020; Taslim et al., 2021; Tuyen et al., 2022; Chazovachii et al. 2021; Yeshitila et al. 2020; Ngaruko & Lyanga 2021).

Figure 3: Upward and downward transaction cost association (n=393)



Source: Research Data, 2023

Table 5: Paired Samples (TDTC and TUSTC) Statistical Test Results

Paired Samples Statistics	Mean	Std. Dev	Std. Err Mean	95% CI of the Diff.		t	df	Sig. (2-tailed)
				Lower	Upper			
TDTC - TUTC	9.295	5.329	0.269	8.767	9.824	34.579	392	0.000

Source: Research Data, 2023

Low upward transaction costs, on the other hand, imply that farmers may sense lower burdens while engaging in vertical integration for activities related to the tea value chain's upper node. Because they perceive relatively reduced costs connected with certain components of the value chain, they may be more ready to participate in vertically coordinated markets, specifically in contract farming agreements. This finding is in line with some other studies like by Arouna et al. (2021) which show that some transaction cost factors like complexity or simplicity of contracts do not have influence on farmers' participation in vertical integration.

Conclusions and Recommendations

Based on the findings of this study, it is concluded that there is variability in transaction costs along the tea value chain nodes in the vertically integrated Greenleaf tea market in Tanzania, with downward transaction costs exceeding upward transaction costs. Furthermore, based on statistical results, it can be conclude that downward transaction costs are significantly higher than upward transaction costs. This conclusion implies that without effective management of downward transaction costs, smallholder tea farmers may avoid participation in vertically integrated Greenleaf tea markets potentially negatively impacting their performance in terms of Greenleaf tea production, income and overall livelihood. Therefore, the study recommends that policymakers should focus on strategies to reduce transaction costs at the downstream node of the tea value chain, such as improving access to information, establishing clear contract arrangements and providing capacity-building support to farmers. Implementing supportive policies can increase smallholder farmers' involvement in the tea subsector, leading to economic growth. Future studies concentrating on contract design and market dynamics can provide further insights and effective solutions for reducing transaction costs associated with farmers' participation in vertically integrated Greenleaf tea markets.

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