

14 August 2017

SCP and Expectations of small-scale wood traders in Tanzania



A.N. van der Kolk (921030458010)

MSC International Development Studies
Development Economics Group

Wageningen University – Department of Social Sciences

Supervisors: Janneke Pieters and Justus Wesseler

Thesis code: DEC-80433

ABSTRACT

This research aims at filling the knowledge gap about the market situation of small-scale wood traders in the Iringa region and how their livelihood might be impacted by changes in the market structure. This is done using the Structure, Conduct and Performance (SCP) framework (Mason 1936, Bain 1951) as guideline. The traditional SCP has been extended with a value chain approach and a Subjective Well-Being variable to encompass the specific situation of the traders. The two different types of traders active in the region, poles and timber traders, differed mainly on the buyer power they faced (Structure) and the volume of sales they sold (Conduct).

Using econometric analysis some links were found between the structure, conduct, performance and expectations of the traders. The causal chain of the traditional SCP framework, which assumes structure as an exogenous variable affecting conduct and conduct in turn affecting profit, was proven using a cross sectional sample of 30 respondents (15 timber traders and 15 poles traders). The expectations about the future are not much affected by the structure, conduct and performance of the traders. Overall, it was found that the wood trading market was quite well-functioning and most likely not impacted by the coming changes in the supply sources of wood in the region. However some improvements in the quality of wood and infrastructure would create more value added for the traders.

ACKNOWLEDGEMENTS

First and foremost I would like to thank my enumerator Erica Jimmy, since without her I would not have been able to carry out my fieldwork in Tanzania as well as I did. She not only helped me with translating the answers from the traders, but she put a lot of effort in finding respondents for me, helping me with my travels and finding accommodation and taught me a lot about Tanzanian culture. I will be forever grateful for all her help and hard work.

I would also like to thank Mohammed, Ivo, Rob, Jackson and Eromini for making my time in Tanzania not only interesting but also fun. I want to thank Green Resources AS, especially Roselyne Mariki and her management team, for supporting me during my field work, not only with information, but also with accommodation and transport. A great thanks to Janneke Pieters, Justus Wesseler, Rein Haagsma and Mohammed Degnet for supervising me and providing feedback on my report, and putting up with my constantly changing deadlines. Lastly, I would like to thank my family and friends who have put up with me these past months especially with struggling to get my thesis done.

CONTENT

Abstract.....	i
Acknowledgements.....	ii
List of tables	v
List of figures.....	v
List of boxes	v
List of abbreviations.....	vi
1. Introduction.....	1
2. The wood market in Tanzania.....	2
2.1 Wood supply	2
2.2 The traders.....	3
2.3 Wood demand	4
3. SCP framework	5
3.1 History of the SCP framework.....	5
3.2 Traditional SCP	6
3.3 Dynamic SCP.....	7
3.3.1 SCP and value chains.....	7
3.3.2 SCP and expectations	8
3.3.3 Subjective Well-Being	9
3.4 Use of the theory	10
4. Research Design	10
4.1 Fieldwork.....	11
4.1.1 Questionnaire	11
4.1.2 Data collection	11
4.2 Data analysis	12
5. Qualitative analysis	13
5.1 Socio-demographic characteristics	14
5.2 SCP framework.....	14
5.2.1 Structure	14
5.2.2 Conduct.....	3
5.2.3 Performance.....	5
5.3 Expectations.....	7
5.3.1 General expectations	8

5.3.2	Specific expectations.....	8
5.4	Summary	9
6.	Quantitative analysis	10
6.1	Poles vs. timber	10
6.2	Explaining conduct	12
6.2.1	Sales per delivery	12
6.2.2	Other conduct variables.....	14
6.3	Explaining performance	15
6.3.1	Profit.....	15
6.3.2	Threshold difference	17
6.3.3	Subjective Well-Being	18
6.4	Expectations	19
6.5	Summary	21
7.	Discussion and conclusion	22
7.1	Discussion.....	22
7.1.1	The objective.....	22
7.1.2	Sample and sample method	23
7.1.3	The usefulness of the SCP framework in a development setting	23
7.1.4	Results.....	24
7.2	Conclusion.....	24
8.	References	26
Appendix 1	Questionnaire	A1
Appendix 2	Descriptive statistics summary	A7

LIST OF TABLES

Table 1: Subjective Well-Being questions	10
Table 2: Questionnaire structure	11
Table 3: Supply concentration	1
Table 4: Competition.....	1
Table 5: Sales per trader	4
Table 6: Number of traders with other sources of income	4
Table 7: Horizontal linkages	4
Table 8: Vertical linkages	5
Table 9: Average profit per delivery (x1.000.000 TZS, not for average)*	6
Table 10: Poles vs. timber*	11
Table 11: Explaining Conduct*	13
Table 12: Explaining sales per delivery*	14
Table 13: Sales per delivery relationship for timber and poles traders*	14
Table 14: Explaining performance*	16
Table 15: Explaining profit*	17
Table 16: Explaining Subjective Well-Being*	18
Table 17: Predicting expectations*	20
Table 18: Summary statistics (part 1)	A7
Table 19: Summary statistics (part 2)	A7

LIST OF FIGURES

Figure 1: Wood Supply Forecast until 2025	3
Figure 2: Marketing Channels in Tanzanian Wood Market	3
Figure 3: GRL plantations	4
Figure 4: Traditional SCP	6
Figure 5: SCP application to a value chain	8
Figure 6: SCP and managerial cognitions	9
Figure 7: Location of respondents	12
Figure 8: Main type of source	1
Figure 9: Demand concentration for outputs	2
Figure 10: Difficulties to trade	3
Figure 11: Set prices.....	5
Figure 12: Percentage threshold difference per trader	7
Figure 13: Subjective Well-Being	7
Figure 14: Profit and sales expectations	8
Figure 15: Future Expectations	9

LIST OF BOXES

Box 1: How does SHI determine poles prices?	19
---	----

LIST OF ABBREVIATIONS

GRAS.....	Green Resources AS
GRL.....	Green Resources Limited
IO.....	Industrial Organization
NFC.....	New Forests Company
SCP.....	Structure, conduct and performance
SHFP.....	Sao Hill Forest Plantation
SHI.....	Sao Hill Industries
TZS.....	Tanzanian Shilling

1. INTRODUCTION

Forests are important natural resources in Tanzania. About 48% of the total land area in Tanzania is covered by forests and woodlands (Indufor 2011). The contribution of forests to the GDP of Tanzania depends on how the forestry sector is defined. According to the Ministry of Finance forestry and hunting account for 2,5% of GDP, but the Ministry of Natural Resources and Tourism also includes soil conservation, water access, climate mitigation and recreational value to the forests, which account for 20,1% of GDP in 2006 prices (TEITI 2014). Also, about 90% of the Tanzanian energy needs are met through the use of wood fuels, of which charcoal is the most important. These energy needs are the main cause of deforestation in Tanzania, estimated at 400.000 ha per year (AFF 2011). Other causes of deforestation are forest fires, clearing for agriculture and illegal logging (AFF 2011, Indufor 2011). The main wood species are eucalyptus, pine and teak. These are mainly used locally for the production of sawn timber, poles, pallets, charcoal, paper and doors and window frames. Mainly due to high population growth, demand for wood is growing in Tanzania, for energy needs as well as construction. Reports on the wood market state that this will cause the forestry sector in Tanzania to grow in the coming years (AFF 2011, Indufor 2011 and TEITI 2014).

This research focuses on the forestry sector in Tanzania, specifically the small-scale wood traders located in the Iringa region that buy the wood from plantations and other sources and sell it to the industry and other clients. The processing industry converts the wood into poles, planks and other wood products. One of those industries is Green Resources AS (GRAS), which is one of the largest forestry and wood processing industries in eastern Africa (Green Resources 2013). GRAS owns the wood processing industry Sao Hill Industries (SHI), who owns the largest sawmill in eastern Africa, and several plantations under the name Green Resources Limited (GRL). This research took place in the region around SHI and the GRL plantations (all located in the Iringa region), but the main focus is on the small-scale wood traders active in that region. There are two types of wood traders in this region. First, the poles traders who buy whole trees and transport them to the larger wood processing industries. Second, the timber traders who buy whole trees and either sell them to smaller sawmills who process the trees into planks, or process the trees themselves before selling planks to their clients.

Little is known about the situation of small-scale wood traders in Tanzania in general. Reports on the wood market in Tanzania attribute this knowledge gap to the lack of data about the small-scale traders (AFF 2011, TEITI 2014, Indufor 2011). Because of this knowledge gap, it is first important to describe the market dynamics for these small-scale wood traders. Second, next to the overall growth of the forestry sector, there are some major changes coming up in the supply sources for wood, upstream the value chain of the traders, both of which might impact the livelihood of the traders in the future (Indufor 2011). To see how this might impact the traders, it is important to know whether there are links between their market dynamics and their expectations about the future. Therefore this research has two objectives. First, describing the market situation for the small-scale timber traders in Tanzania. This is done using the Structure, Conduct and Performance (SCP) framework (Bain 1956, Hay and Morris 1991, Lee 2007, Martin 2002, Mason 1939, Schmalensee 1989, Scherer and Ross 1990). The second objective is to see whether there are links between the structure, conduct and performance of the traders, and their expectations for the near future. The research question answered by this research is: *To what extent are there relationships between SCP framework characteristics of the small-scale wood traders and how does this affect their expectations about their future livelihood?*

The remainder of this paper is organized as follows. Chapter 2 will give a more elaborate overview of the wood market as faced by the small-scale traders and its most important actors. Chapter 3 will

introduce the theoretical framework used in this research. Chapter 4 will describe the research design after which chapter 5 and 6 will give the qualitative and quantitative analysis of the data. Chapter 7 will discuss and conclude this research.

2. THE WOOD MARKET IN TANZANIA

This chapter introduces the wood market in Tanzania. The focus of the research is the small-scale wood trader, and therefore not the entire value chain is considered, only the immediate links to these traders. The most important players considered in this research are the supply sources (2.1), the traders (2.2) and the most important clients of these traders (e.g. the wood demand in part 2.3).

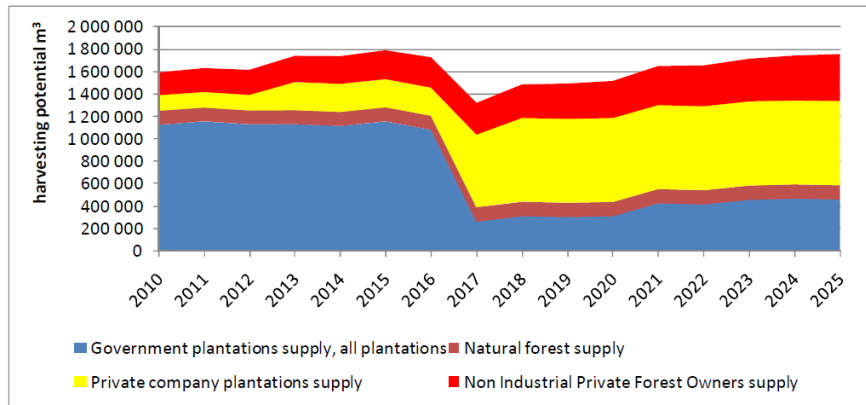
2.1 WOOD SUPPLY

There are 4 different sources of wood supply: government plantations, private plantations, woodlots (small, non-industrial private plantations) and communal forest. The main source of wood are the government plantations, which in 2011 were supplying 79% of industrial wood in Tanzania. Of this 85% came from the government plantation Sao Hill Forest Plantation (SHFP) (AFF 2011). However, due to financial problems, illegal logging, fires and bad management the government plantations were degrading in the period 1990-2000. There was no structured replanting of harvested areas and management of growing forests. This will cause a significant drop in the supply of wood from government plantations in the coming years (see Figure 1). This development has not been confirmed, nor denied, by the management of SHFP in the interview on location in the end of February 2016 (S. Joseph, personal communication, February 2016). However, it was confirmed that between 1990 and 2000 the government plantations had a shortage of money which resulted in little (re)planting and thus little harvesting the coming years. Since the early 2000's, SHFP has a new sustainable planting scheme, financed by the Logging and Miscellaneous Development Account. 50% of all sales are deposited in this account and then used for replanting and even support other plantations (idem). This means that in the longer term the supply drop will be compensated again.

The second largest suppliers of wood for the forestry industry are private plantations and woodlots (small non-industrial plantations). The forecast done by Indufor (2011), as seen in Figure 1, predicts that when the government supply plunges in 2017, this will be mainly caught up by private plantations. These estimations do not include the wood from woodlots, because there is no reliable data on the supply of woodlots in general, let alone for industrial purposes (Indufor 2011). During the interviews with the traders, it became clear that the general sentiment among traders in the Iringa region is that the number of woodlots is on the rise. It is viewed as a profitable investment for land otherwise not used (personal communication, February and March 2016). Most of the private plantations that are expected to minimize the gap left by SHFP are owned by GRAS, a large Norwegian forestry company active in the Iringa region. Where SHFP is expecting a supply drop, GRAS planted a lot of new plantations in the 1990's and is therefore expecting an increase in supply. How much of the supply lost due to the low harvests of SHFP is caught up by GRAS and the woodlots is unclear, due to the lack of data on woodlots.

Communal forests are the last source of wood. However, wood products from the communal forests are mainly used for household and energy needs and not for the processing industry (Indufor 2011). Data on harvesting in communal forests is unavailable, mainly due to illegal logging and the household-use of the wood. Estimated is that for energy production only around 10% of the needed wood for production comes from private plantations and the rest is (illegally) harvested from communal forests (Indufor 2011). The supply from communal forests is thus not of interest for this research, which is reflected in the fact that none of the traders give communal forests as a source for their wood. However, since logging in these forests is illegal, these answers might be incorrect.

Figure 1: Wood Supply Forecast until 2025

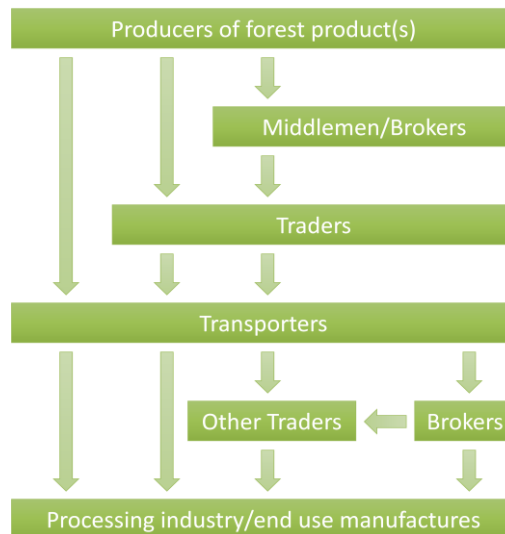


Source: Indufor 2011

2.2 THE TRADERS

The wood traders, who are the focus of this research, operate against this dynamic background. They are the middlemen that buy wood from plantations and woodlots and sell it to the processing industry and other buyers. As can be seen in Figure 2, sometimes their deals are arranged through brokers, mostly they arrange these themselves. The traders in this situation are also the transporters, but often they have to rent a truck, because they don't own one (Indufor 2011).

Figure 2: Marketing Channels in Tanzanian Wood Market



Source: Indufor 2011 (edited)

In the Iringa region there are two types of traders: poles and timber traders. The poles traders trade whole trees that are processed into poles, mainly for electrical poles and fences. These trees have to be straight and from a hardwood, such as eucalyptus. The timber traders trade either trees that will be processed into planks for construction or they already process their own trees into planks with a small sawmill and sell the planks. The type of wood is less important for the timber traders than for the poles traders, since poles have to be strong and straight and therefore the wood has to be of higher quality than the wood for timber. More differences between timber and poles traders will be explained in chapter 5, the qualitative data analysis.

2.3 WOOD DEMAND

There is increasing demand for wood nationally as well as internationally. Tanzania has a growing population and a high urbanization rate, which means demand for construction materials is increasing. Also the demand for electricity poles will increase (AFF 2011). One of the key export markets is Kenya and the main export products are sawn timber and poles (Indufor 2011). But also demand from other markets with large population growth and economic growth is on the rise (e.g. China and India). However, most of the timber and poles are traded domestically and not exported due to high transport costs associated with the transport of wood.

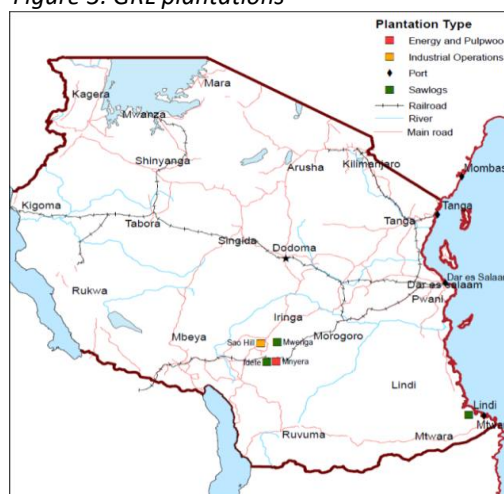
In the Iringa region there are several buyers for the poles and timber from the traders. Large buyers are the processing industries, such as Sao Hill Industries and New Forest Company. Other buyers are local small scale production (a local sawmill or carpenter), other traders or production outside of the region. Timber and poles traders face different demand. Whilst the poles traders mainly deliver their products to the large processing industries, the timber traders trade with all types of buyers, except for the processing industries. This is due to the low quality of the wood from small-scale timber traders, compared to the quality of the wood from SHFP, where SHI currently gets its wood supply for timber from. During an interview an employee of SHI indicated that the lack of quality certification for woodlots is a problem, because this leads to good quality wood being processed into timber, while there is a shortage of this type of wood for poles (personal communication, February 2016).

Demand for poles: The processing industry

GRAS was the host organization during the fieldwork for this research. According to their website it is the largest forest company in Africa, outside of South Africa and Swaziland (GreenResources 2013). In Tanzania it operates one processing industry (SHI), 4 plantations (Mwenga, Idete, Myerna and Lindi) and 4 timber yards where the wood products are sold. A map with the locations of the processing industry and the plantations is shown in Figure 3: GRL plantations. Around these sites the field work took place. Next to sawing timber and producing poles, SHI also manufactures pallets and doors.

During interviews at SHI, SHFP and the questionnaires it became clear that in the Iringa region SHI only has one major competitor, which is New Forests Company (NFC) based in Iringa. Traders trading poles basically have the choice to deliver their wood to NFC or SHI. NFC is a younger company, which started activities in Tanzania in 2009. It has one processing industry in Iringa and one plantation in Kilolo (Iringa region) (New Forests Company 2017).

Figure 3: GRL plantations



Source: GreenResources 2013

There are some small industries manufacturing poles, but the bigger companies pay higher prices to their suppliers. Both big companies decide which price they will pay the traders. At SHI the traders deliver the wood for the poles, which consists of Eucalyptus. According to the management of SHI it is not feasible to get eucalyptus trees for poles from SHFP because they would have to buy a whole woodlot and do the harvesting themselves. In these cases about 20% of the wood will be useful for manufacturing poles; the rest will become firewood, making it a less profitable investment. SHI therefore prefers to buy their eucalyptus from the traders. However, due to quality concerns, if it becomes possible to do 'selective harvesting' (picking out the trees you want to have) at SHFP, SHI would prefer to buy the poles from the government plantation instead of the traders (J.M. Njenga, personal communication, February 2016).

To summarize, the wood market in Tanzania is on the verge of a big shift in supply sources. How this will impact the rest of the market is unknown, since it is unclear how much of the shortfall of the government will be caught up by private plantations and especially woodlots. The traders operate against this dynamic background, transporting the wood from their supply sources to their clients. These clients are the processing industries, other traders, local small-scale production or production outside the region.

3. SCP FRAMEWORK

This chapter introduces the SCP framework as the theoretical framework for this research. Section 3.1 goes into the history of the SCP framework and section 3.2 explains the traditional SCP framework. A more dynamic approach to the SCP framework and other extensions are discussed in section 3.3. Section 3.4 elaborates the use of the theory in this research.

3.1 HISTORY OF THE SCP FRAMEWORK

The earliest appearance of the SCP framework is in the work of Edward Mason (1939) and later in the more influential work of his PhD student Joe Bain (1956). The framework was a response to the need for a model in the field of Industrial Organization (IO) to be able to predict firm performance. Mason argued that by studying the different aspects of the market structure and pricing policies a correlation between those two factors could be found. Mason named the characteristics of the product, the cost function of the firm, the buyer- and seller concentration, the distribution channel and the demand function as influencing the pricing policies of a firm. Because the more theoretical, neoclassical, economic approach required information on the cost structure and demand structure, which in reality are hard to specify, he proposed a more empirical approach, by correlating market conditions with pricing behavior, (Mason 1939). After this initial paper, most of the research entailed detailed case studies of individual industries to identify important market structure conditions that affect price response. The main hypothesis formulated in this period was the collusion hypothesis, which stated that concentration (as a measure of competitiveness of the industry) determined the pricing policy and thus profitability (Bain 1951).

Where Mason's work focused on identifying market structure conditions affecting pricing policy in specific firms or industry, Joe Bain's work (1951, 1956) focused on comparing different industries to each other to empirically test the collusion hypothesis and his initial research seemed to confirm this hypothesis (Bain 1951). Because his work was the basis for the anti-trust laws (see for an evaluation Marion and Sporleder 1976), many other researchers have extended on the SCP framework following Mason's and Bain's work, each with a different interpretation of the collusion hypothesis and with different indicators for the variables of structure, conduct and performance (for more extensive surveys of the literature of the SCP framework see Hay and Morris 1991, Lee 2007, Martin 2002,

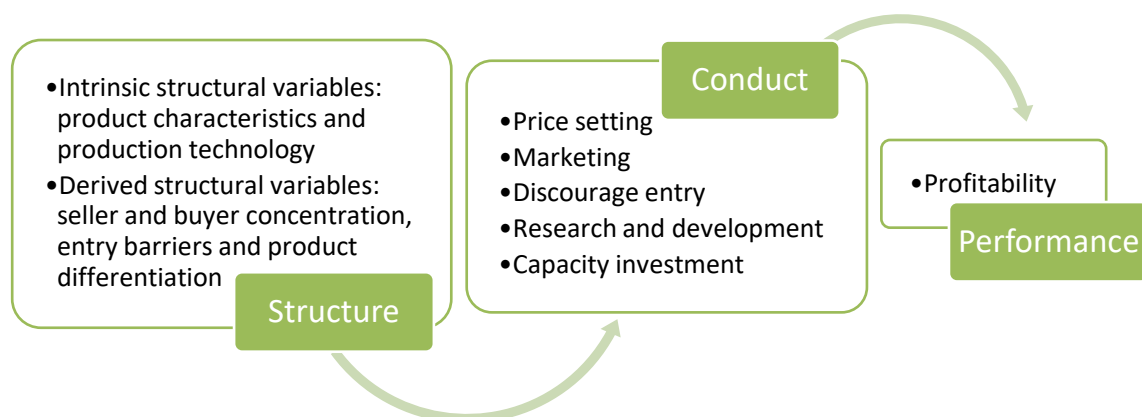
Scherer and Ross 1990 and Schmalensee 1989). Based on this research, Schmalensee concluded that *“The relation, if any, between seller concentration and profitability is weak statistically, and the estimated concentration effect is usually small. The estimated relation is unstable over time and space and vanishes in many multivariate studies”* (1989 p. 976).

Although this result was disappointing with respect to the original goal of the SCP framework, this did not mean that the framework had lost its importance. Numerous fields outside of IO had adopted the SCP framework for various functions: describing a market, value chain or industry, identifying other factors of importance for either market structure, conduct or performance and formulating new hypotheses or extending the framework with other factors of influence on the structure, conduct and/or performance of a firm, industry or value chain. Two of these extensions will be used for the formulation of relevant indicators for this research. But before these are explained in more detail, first the traditional SCP framework as envisioned by Mason (1939) and Bain (1956) will be described.

3.2 TRADITIONAL SCP

The SCP framework comprises three pillars, the structure, conduct and performance. The traditional framework, as introduced by Mason (1939) and Bain (1956), defined structure as the environment in which conduct and performance took place. The object of study would be a firm or an industry or multiple firms or industries. The main causal chain in the framework ran from identified structure as exogenous variable affecting conduct, and conduct then affects performance (see Figure 4). Or as Mason stated: *“The argument [...] runs from differences in market structure to differences in price response, and from difference in price response to the consequences of these differences for the functioning of the economy.”* (1939, p. 73).

Figure 4: Traditional SCP



According to Schmalensee (1989), structure comprises *“relatively stable, observable variables”* that could be used to predict conduct and performance (p. 945). Mason called these variables *“all those considerations which [the seller] takes into account in determining his business policies and practices”* (1939, p. 69). In the traditional framework the structure is seen as an exogenous variable determined outside the scope of the decision maker. These variables can be either intrinsic or derived (Schmalensee 1989, Lee 2007). Intrinsic structural variables are determined by the product characteristics and available production technology. Derived structural variables are determined by the environment (e.g. institutions or other firms) such as seller and buyer concentration, entry barriers and product differentiation.

Conduct was defined by Mason (1939) and Bain (1956) as the changing price and production policies of the seller, in reaction to changes in the market structure. Conduct is thus described as the decisions made by a seller in reaction to the changes in market structure. This behavior includes price setting, but also marketing, strategies to discourage the competition and new entrants, research and development and capacity investment (Lee 2007). In the traditional SCP framework performance was the profitability of the firm or industry, usually measured in some profit ratio or price-cost margin (Lee 2007).

3.3 DYNAMIC SCP

The first major critiques on the traditional SCP concerned the one-way direction of the causal chain and the thus implied exogeneity of the structure variables. The critique entailed that the cross sectional studies overlooked the fact that over time, performance and conduct might influence the market structure, which would make market structure endogenous (some authors voicing this concern are Demsetz 1973, Pelzman 1977, Scherer and Ross 1990 and Schmalensee 1989). These concerns were nicely summarized by Evans et. al. (1993). The concern was that, over time, performance feeds back into structure. Simply said, according Evans et. al. (1993), profitable industries will be more attractive to entry than unprofitable industries, and therefore the structure will be affected by the performance of the industry, and thus will be endogenous. The second concern was about the relationship between structure (as measured by concentration) and conduct. Because conduct entailed output and price policies, and concentration was usually measured with an output ratio, the structure and conduct variables are very likely to be correlated. This also makes the structure variable endogenous (Evans et. al. 1993).

The result of these critiques was a shift from the traditional, one-way, SCP framework to a more dynamic framework in which all three variables are interrelated. This makes empirical analysis more difficult, due to the lack of exogenous variables. Researchers continued the empirical work to try and construct models that could explain and maybe even predict the dynamics between market structure, conduct and performance, incorporating the new critiques. Other fields also became more active in working with the SCP framework, and used it more to identify relevant variables of markets in their field and used these for description or analysis. Two of these extensions are of interest for this research: the value chain perspective and the SCP including expectations. This research also makes its own extension, namely the inclusion of Subjective Well-Being as a performance indicator. This is done to include the specific development context of these traders.

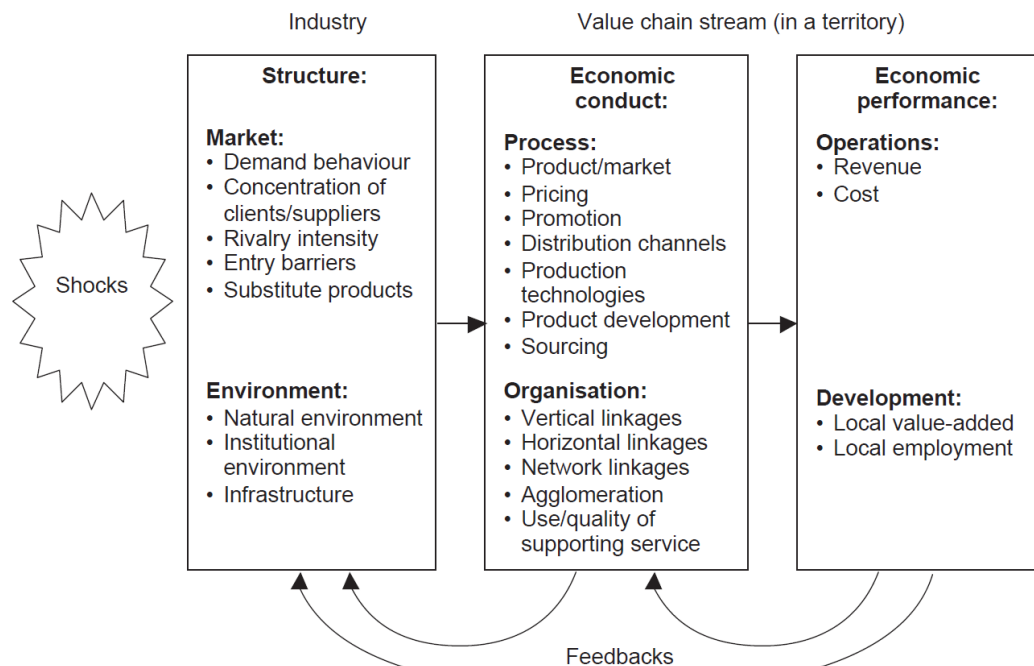
3.3.1 SCP and value chains

Coming from a value chain perspective, Figuerêdo Junior, Meuwissen and Oude Lansink (2014) adapted the SCP framework to analyze the structure of (part of) a value chain. In this setting the conduct is defined as the choices made in the value chain, instead of the choices made by an individual firm or industry. This means the individual firm (or industry) does not only react to changes in its own market structure, but also to changes in the suppliers' structure upstream, or the buyers' structure downstream. The value chain as a whole thus reacts to changes in the market structure it and its competitors operate in. To incorporate the value chain perspective in the SCP framework, Figuerêdo Junior, Meuwissen and Oude Lansink (2014) add some new variables to the different pillars. Most notable are the new variables for conduct, mostly related to horizontal and vertical integration. From a value chain perspective, the structure upstream or downstream might force a business to work together with either its buyers, suppliers or competitors, thus creating horizontal and vertical linkages (see Figure 5).

They also added a fourth element to the dynamic SCP model; the exogenous shocks. These are changes in, mostly, the structure of the market that do not originate from the conduct or

performance of the market and thus are exogenous. This phenomenon is described in paragraph 3.2 as the derived structural variables. These exogenous shocks affect the structure, conduct and performance in a value chain, and this creates feedbacks through the framework as seen in Figure 5.

Figure 5: SCP application to a value chain

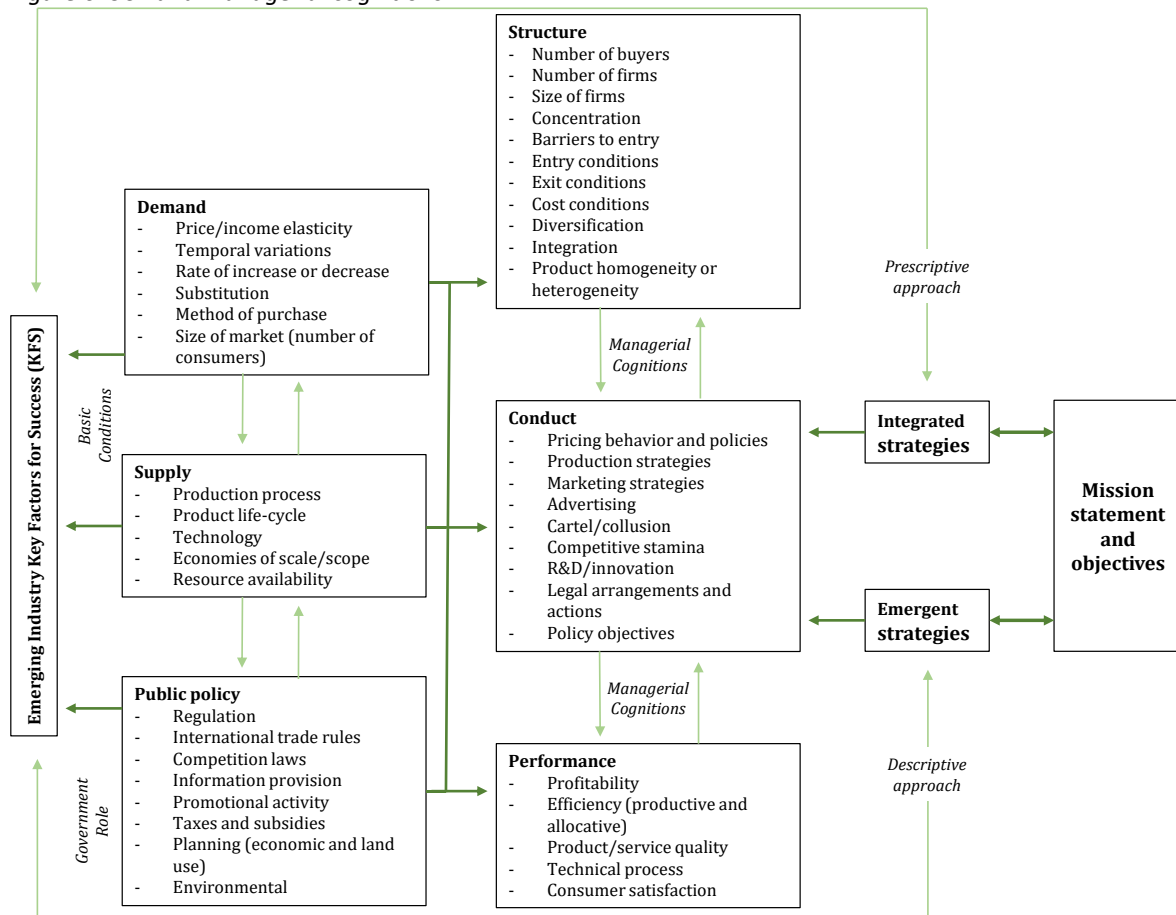


Source: Figuerêdo Junior, Meuwissen and Oude Lansink (2014)

3.3.2 SCP and expectations

The second extension originates from strategic management. In the management sciences, the SCP framework is used as a way to describe the variables affecting performance, and formulating strategies based on this. Conduct is thus viewed as the strategy of a firm, industry or value chain. An important concept within this line of thinking for this research comes from George Panagiotou (2006). He reckons that since strategies are determined by people, more specifically the management, the cognitions of the management are therefore an important factor influencing the conduct and thus also the structure and performance. The cognitions of the managers are described as “... the ways in which managers analyze and make sense of their environments ..., perceive and categories their competitors ..., and take decisions about competitive strategies ...” (Panagiotou 2006, p. 426). In other words, the perceptions and believes of the managers about their market environment affect the structure, conduct and performance of this market. Panagiotou (2006, p. 427) even goes as far as to call the managerial cognitions the “[SCP] framework’s innermost element”. Panagiotou’s view on the SCP framework is seen in Figure 6. In the middle column of this figure we can see the SCP framework and the role the expectations of the manager (managerial cognitions) play in the framework. With expectations in this research is meant the perceptions and believes of the wood traders about the situation in their market with respect to the demand, supply, prices and profit in the coming years. These expectations are therefore similar to the managerial cognitions of Panagiotou. Expectations especially play a role in the conduct of the manager, which is not surprising since conduct is the reaction of a firm towards a move of his rivals. But there is also a two-way relation between the expectations and performance and expectations and structure.

Figure 6: SCP and managerial cognitions



Source: Panagiotou 2006 (edited)

The applications and extensions of the SCP framework mentioned here are by no means a complete list of all the dimensions of this framework. Yet this research focuses on these extensions because of their use for describing and analyzing the market of the wood traders in Tanzania. The value chain perspective is relevant because the traders are a part of a value chain and their upstream and downstream linkages are an important part of their structure and conduct. And with the coming changes in the wood market in Tanzania, it is interesting to know the role of their structure and conduct in their expectations. A list of relevant indicators for this research will be introduced in chapter 5. However, there is one indicator that needs a bit of an introduction, since it has not been used before in the SCP literature. Therefore the variable Subjective Well-Being will be introduced in the next section.

3.3.3 Subjective Well-Being

To include a broader view on performance, not only the performance of the traders' business, also questions on the Subjective Well-Being of the trader are included in this research. Subjective Well-Being is interpreted as a persons' quality of life. It thus not only measures a person's income, but also other aspects of a person's life. In 2009 the Commission on the Measurement of Economic Performance and Social Progress released a report in which it identified Subjective Well-Being as an extension to the traditional GDP measurements, because it was felt these lacked an immaterial dimension. This report describes Subjective Well-Being to "encompass [...] three different aspects: cognitive evaluations of one's life, positive emotions (joy, pride), and negative ones (pain, worry, anger). While these different aspects of subjective well-being have different determinants, in all cases these determinants go well beyond people's income and material conditions." (Stiglitz et al. 2009, p. 216). Subjective Well-Being is included in this research to include this immaterial aspect in the performance part in the SCP framework of the traders.

The relationship between economic status and Subjective Well-Being has been extensively researched since the mid 1900s (Howell and Howell 2008). A meta-analysis of the recent literature on this relationship confirms the theory that economic status increases Subjective Well-Being, but this relationship is strongest in poorer samples, e.g. samples from developing countries (idem). This is explained by need theory (Easterlin 2001). This theory states that income and assets have the strongest relationship with Subjective Well-Being when basic needs still need to be met. Therefore Subjective Well-Being is included in this research, since the sample consists of traders with a relatively low economic status and the relationship between their economic activity and their Subjective Well-Being is expected to be strong. There are also studies that indicate a reverse relationship where Subjective Well-Being affects economic status because it influences the choices one makes with respect to his conduct (Lyubomirsky, King, and Diener 2005).

Since Subjective Well-Being is not a material possession but rather an (emotional) state of mind, researchers found it difficult to measure it before the new millennium. However, in the past three decades research on the measurement and determinants of Subjective Well-Being increased exponentially, and it was found that surveys are a valid and reliable way of measuring Subjective Well-Being (OECD 2013). This led to the OECD Guidelines on Measuring Subjective Well-Being in 2013 (OECD 2013). These guidelines also form the foundation for the way Subjective Well-Being is measured in this research. Since measuring and finding determinants for Subjective Well-Being are not the objective of this research only two of the 5 proposed question modules are included. These two modules include 2 core questions about overall life satisfaction and 5 domain evaluation questions about satisfaction in certain domains. The questions included in the survey are displayed in Table 1, as well as the name of the dimension measured by the question.

Table 1: Subjective Well-Being questions

Question	Dimension
1. Overall, how satisfied are you with your life as a whole these days?	Life in general
2. Overall, to what extent do you feel the things you do in your life are worthwhile?	Activities
3. How satisfied are you with your health?	Health
4. How satisfied are you with your personal relationships?	Personal Relationships
5. How satisfied are you with how safe you feel?	Safety
6. How satisfied are you with your future security?	Future security
7. How satisfied are you with the quality of your local environment?	Local environment
8. How satisfied are you with the way you are able to provide a livelihood for yourself	Livelihood

Source: OECD 2013

3.4 USE OF THE THEORY

The SCP framework and its extensions are used in two ways. First it was used to identify the relevant indicators for the three different pillars to be included in the questionnaire. This will be elaborated in chapter 4 and 5. Second, the theory is used to guide the quantitative analysis in chapter 6 by identifying the direction of relationships. The logic of the traditional framework stipulates that, in a cross sectional dataset without feedbacks, structure affects conduct, conduct affects performance and expectations are affected by the whole SCP framework.

4. RESEARCH DESIGN

This chapter explains the research design. The data was gathered by the researcher during a field trip in the Iringa Region in Tanzania, which will be discussed in section 4.1. The methods for data analysis are introduced in section 4.2.

4.1 FIELDWORK

The first part of the research was the fieldwork in Tanzania. During this fieldwork interviews were held with the management of SHI and SHFP and a questionnaire was answered by the respondents of interest: the traders. This section will first introduce the questionnaire and then the data collection.

4.1.1 Questionnaire

The questionnaire consisted of three parts: (A) socio-demographic characteristics, (B) SCP framework and (C) expectations. Part A includes general questions about the characteristics of the trader, such as gender, age and education. Part B asks questions about the structure, conduct and performance of a trader. Part C evaluates the expectations of the traders. To see which categories are included in each section, see Table 2. The full questionnaire can be found in the appendix.

Table 2: Questionnaire structure

(A) Socio-demographic characteristics		
	Location	Age
	Gender	Highest education
(B) SCP Framework		
Structure	Supply concentration	Product differentiation
	Demand concentration	Barriers to entry/exit
	Number of competitors	
Conduct	Experience	Product diversification
	Product	Income diversification
	Threshold price	Vertical linkage
	How are prices set	Horizontal linkage
	Wood delivery	Technology/investments
Performance	Revenue	Profit
	Buying price	Sales
	Costs	Subjective well-being
(C) Expectations		
General expectations	General timber market	Security
Knowledge	GRAS competition	GRAS supply
Specific expectations	Still in the market	Quantity
	Price	Profit

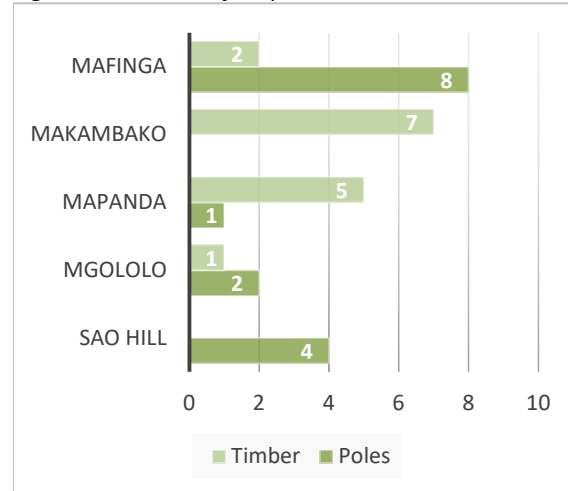
4.1.2 Data collection

The data collection was done in February and March in 2016 in the Iringa region in Tanzania. At the start of the data collection, personal interviews with the management of GRAS and SHFP were held to assess the market dynamics. After this, the researcher interviewed 32 respondents using a structured questionnaire with the help of a translator. The first two respondents were to test the questionnaire and are not included in the final analysis. In the end the sample included 30 respondents, of which 15 were timber traders and 15 were poles traders. This division was made on purpose, to obtain two equal groups which could be used for comparison. However, from the field work it became clear that there are more timber traders than poles traders, thus the (relative) group size is not representative. The respondents were not randomly selected, this was not possible because there was nowhere the traders had to be registered, especially timber traders, and thus no sampling frame could be formed. The respondents were chosen at convenience.

The traders were interviewed at five different locations. The number of traders interviewed in each location was dependent on the availability of the traders. For the exact division of interviewed traders per location see Figure 7. There is much difference in the location of the poles traders versus the timber traders. Mafinga and Makambako are both large cities in the region. Makambako is known for its timber market and Mafinga is known for both the poles industry and timber industry. The traders interviewed at Sao Hill were all from Mafinga. Mapanda and Mgololo are two small villages close to a GRL plantation. Occasionally one would meet a poles trader here, gathering poles to bring to Mafinga or Iringa, but most of the traders were timber traders. These are mostly people

with their own woodlot that gather the timber from their own woodlot and their neighbor's woodlot to sell to other traders. It was not difficult to find many respondents in Mafinga and Makambako, since these are big cities and hubs in the timber and poles industries. Finding respondents in the smaller villages was a challenge because they lived more dispersed and were sometimes unwilling to cooperate.

Figure 7: Location of respondents



4.2 DATA ANALYSIS

The analysis of the data was twofold. First, the data was qualitatively analyzed to get a better overview of the market situation of the traders. This is reported in chapter 5. The data was summarized to identify the main differences between the poles and timber traders. Second, the data was analyzed with econometric analysis to identify how market structure, conduct and performance affect traders' expectations, which is reported in the quantitative analysis in chapter 6. Since this research is based on cross-sectional data and not panel data, there is no time variable in the model, and a static, traditional SCP where structure is exogenous is a fitting model describing the relationship between the available variables. A negative implication of this is that there is no information on the feedbacks created through the model. Various econometric techniques such as t-tests, ordinary least squares regression and (ordinal) logistic regression were used to see whether there are differences between the two types of traders and whether there are links between the structure, conduct, performance and expectations of the traders.

Following the logic of the traditional SCP framework (without feedbacks), where structure affects conduct, both structure and conduct affect performance and expectations are affected by the whole SCP framework, the following general relationships were tested:

- 1) $Conduct = b_1 + b_2Structure$
- 2) $Performance = b_1 + b_2Structure + b_3Conduct$
- 3) $Expectations = b_1Structure$
 $Expectations = b_1Conduct$
 $Expectations = b_1performance$
 $Expectations = b_1Structure + b_2Conduct + b_3Performance$

Whereby the null hypotheses are that the coefficients are equal to 0, and there does not exist a relationship between these variables. Since this framework has not been adopted in a development setting before, it is difficult to find some precedents on the variables, let alone hypotheses. Some

rudimentary hypotheses will be given, as would be expected from earlier research with this framework, or from general (economic) literature.

The central hypothesis of the SCP framework is the collusion hypothesis: more concentrated markets earn higher profits, regardless of their efficiency (Bain 1951). The reason for this is that concentrated markets have less competition and are more likely to collude. Therefore one would expect at least an indirect effect of competition on profits, as well as an effect of horizontal cooperation on profits. Extending this to the supply chain, this means that there would also be an effect of horizontal and vertical linkages on the profits. The hypothesis that follows from this literature is that traders with higher levels of horizontal and/or vertical cooperation and lower levels of competition will earn higher profits.

Another important variable for the structure is the buyer power a trader faces. Inderest and Wey (2007) stated that when faced with higher buyer power a firm will increase innovation and output to reduce possible losses from losing this buyer. Other theories about the effect of buyer power on the conduct include the theory that increased buyer power decreases competition and actually increases cooperation, and thus one might expect a positive relationship between buyer power and horizontal and vertical linkages (Dobson et. al. 1998). The same authors also argue that the greater the buyer power, the lower the factor prices and the influence of the trader on the price, therefore another hypothesis for this research is that traders with high buyer power have less individual price influence and lower profits (idem).

The Subjective Well-Being and Expectations are not included in the traditional SCP framework. Panagiotou states that *“one can reasonably conclude that the social construction of competitive environments and the process of competitive enactment influence managerial perceptions of competition, and form belief similarities about competitive challenges”* (2006, p. 436). According to this, we should expect some (indirect) influence of competition on the expectations of the traders. Subjective Well-Being is a new variable in the framework, but Diener et. al. state some relationships in his review that are interesting for this research (2009). First he states that Subjective Well-Being is often positively correlated with income. Since income for the traders is derived from the profit, this would mean that profit is correlated with subjective well-being. However, this relationship is not tested, since they are both included in this research as performance indicators. One might expect though that variables increasing performance will also increase Subjective Well-Being. It is also positively correlated with job satisfaction. However, for this last one there is no data, because this is already included in our indicator for Subjective Well-Being. The review does not state any direct relationships between structure or conduct and Subjective Well-Being.

With these hypotheses in mind the general equations will be tested in chapter 6. Besides the general regressions, it is also tested whether there are different relationships for timber and poles traders. This is done with the use of dummy and interaction variables. The results of both the quantitative and qualitative analysis are reported in the next two chapters.

5. QUALITATIVE ANALYSIS

This chapter is the qualitative analysis of the SCP framework and expectations of the small scale wood traders in the Iringa region of Tanzania from the data. The goal of this chapter is to summarize the characteristics of the wood traders and identify the main differences between timber and poles traders, as well as any other interesting relationships for the quantitative analysis in chapter 6.

The survey was set up in three parts and therefore this chapter also has three parts. The first part included general questions about the socio-demographics of a respondent and these will be discussed in 5.1. The second part included questions on the separate SCP indicators (as indicated in

Table 2), which will be discussed in 5.2. The third part gives information about the knowledge and expectation of the traders and this will be discussed in 5.3.

5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

In this part we describe the general features of the traders. This includes gender, age, education and experience. Almost all traders were men, only 1 trader was a woman. The average age of the traders was 39; the oldest trader was 83 and the youngest 24. The average age of timber traders is 37, compared to the average age of 41 of the poles traders. Most traders finished their primary school (until 7th grade). Some went to secondary school and only a few had a higher education. The experience of a trader is measured in the number of years he has been trading wood. Timber traders were equally divided over the groups 0-5, 6-10 and >10 years. Most of the poles traders were new, with less than 5 years of experience. Only 2 poles traders had been in the business for more than ten years.

5.2 SCP FRAMEWORK

The SCP framework consists of 3 pillars. The structure describes the environment of the traders and is discussed in 4.2.1. Within this environment traders conduct their business. The conduct is described as the individual trader's policies towards the moves of his rivals, which is described in 4.2.2. In 4.2.3 the performance of a trader as reflected in the financial output of the trade and his Subjective Well-Being is described.

5.2.1 Structure

In this cross sectional dataset the structure of a market is fixed. This is why the traditional SCP framework assumed the structure as an exogenous variable (Lennartz, Haffner and Oxley, 2012). The structure of the value chain is described, which includes the supply concentration of the inputs used by the traders, the competition amongst traders and the demand for the traders' output (wood, poles or timber). These variables will be central in the quantitative analysis as well. After this the difficulties to trade will be looked into.

Product

The biggest product differentiation of the traders in this research is the choice for timber or poles as main product. The type for either one of these products indicates a different type of market, and a different market structure. Most of the traders trade only one of these products, although two traders indicated to trade both timber and poles. Of these traders one was classified as poles trader and the other as timber trader, based on their last trade. Two traders indicated that their products (timber) were treated with chemicals. The wood for poles was exclusively Eucalyptus, since this is a hardwood. Two-thirds of the timber traders traded pine and one-third traded eucalyptus. Poles traders are much more dependent on the quality of the wood than timber traders, since their clients have certain quality standards. One of the employees of SHI actually mentioned the fact that small sawmills and timber traders often use the good quality wood for their products, whilst they can use the lesser quality wood as well, and therefore create a shortage of good quality wood for poles (personal communication, March 2016). The quality is dependent on the source of the wood. Wood from woodlots often is of lower quality than wood from the larger plantations.

Supply concentration of inputs

The supply concentration of inputs is determined by the number of suppliers the trader can get his wood from. It is important for this research to distinguish between a type of source and the number of suppliers. A type of source is for example woodlots, but one trader can get his wood from multiple woodlots and thus have a higher number of suppliers. In general a trader can get the wood from his own plantation, the woodlots of other people, a private plantation of a big company, the

government plantation or other traders. As an indicator for supply concentration of inputs the main source is used, rather than the number of suppliers, since the types of sources each indicate their own supply concentration of inputs. The main type of sources for the traders can be seen in

Figure 8. The supply concentration faced by the traders is summarized in Table 3. Since most traders use woodlots as their main supply, the supply concentration they face is low. The same goes for the traders who use other traders as their main supply, or could not indicate their main source. Traders that use the government plantation or their own plantation have a high supply concentration.

Figure 8: Main type of source

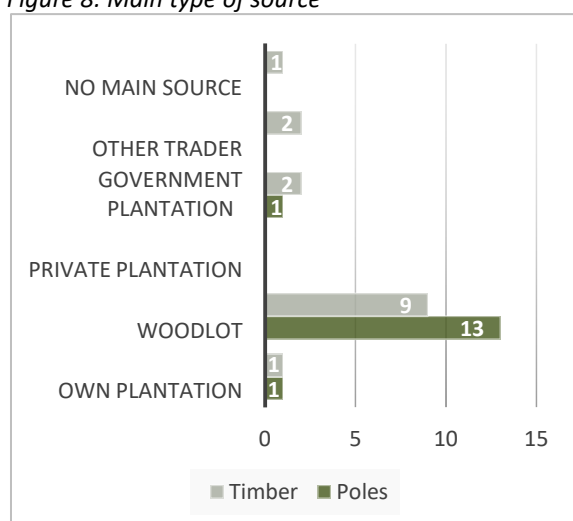


Table 3: Supply concentration

	Total	Poles	Timber
High	5	2	3
Low	25	13	12

Competition

Competition is determined by the number of other traders the trader has to compete with for buying his inputs and selling his outputs. The more other traders a trader has to compete with for either the inputs or the buyers the less bargaining power the trader has. The respondents were asked to indicate how many other traders with the same type of product there are in the market. While this does not indicate the true competition between the traders, it indicates the competition a trader thinks he faces at the moment of the questionnaire, and therefore fits the cross sectional data. Traders indicating “many” as their competition got the label *high competition*, others got the label *low competition*.

Table 4: Competition

	High competition	Low competition	No information
Region			
Sao Hill	3	1	
Mgololo	1	2	
Mapanda	1	5	
Makambako	4	2	1
Mafinga	10	0	
Type of trader			
Poles	12	3	
Timber	7	7	1

Table 4 summarizes the competition faced at each of the locations and for the different types of traders. It becomes clear that the competition is viewed less in the small towns is than in the big towns (traders interviewed at Sao Hill are traders from Mafinga). The table also indicates that poles traders view their competition to be more intense than timber traders. This seems strange because in the region around Mafinga and Makambako there are more timber traders than poles traders. This could be due to the fact that poles traders can only deliver to companies that process the poles, like

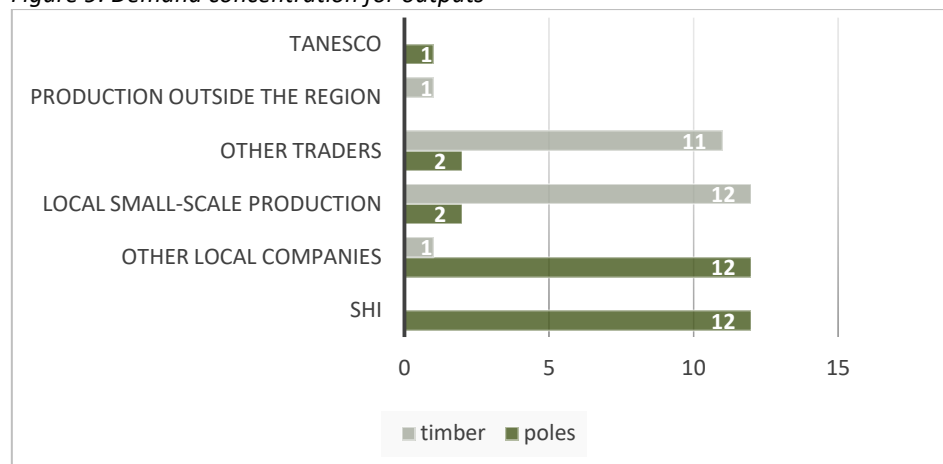
SHI and NFC. They ask for high quality wood, which is scarce, and therefore the competition for this wood is much more intense.

Buyer power

This research uses the buyer power a trader faces as an indicator for demand concentration. The demand concentration for output is determined by the number of buyers the trader can sell his wood to. The more buyers a trader can sell his wood to, the better price he can bargain for his products, the less buyers a trader can sell to, the more buyer power he faces, and the less bargaining power the trader has. As with the type of supplier, the type of client already indicates much about the buyer power a trader faces. Traders selling to SHI, other local companies and Tanesco only have a few buyers. Most of them have only one company as a client, some of the traders indicated to sell to a few local companies (SHI and NFC included). The buyers know there are few other buyers and therefore have high buyer power over the traders. Traders selling to local small scale production, other traders and production outside the region have much more potential buyers, and thus face lower buyer power.

The difference in the type of clients between timber and poles traders is quite striking, see Figure 9. None of the timber traders deliver wood to SHI. Timber traders mainly deliver their wood to other traders and local small-scale production, while poles traders deliver their products to the big companies. There are two big companies (SHI and NFC) and some smaller companies in the Iringa region that produce and process poles. Most of the poles traders deliver to SHI in Mafinga and/or NFC in Iringa. Comparing the types of clients between poles and timber traders, the poles traders face higher buyer power than timber traders.

Figure 9: Demand concentration for outputs



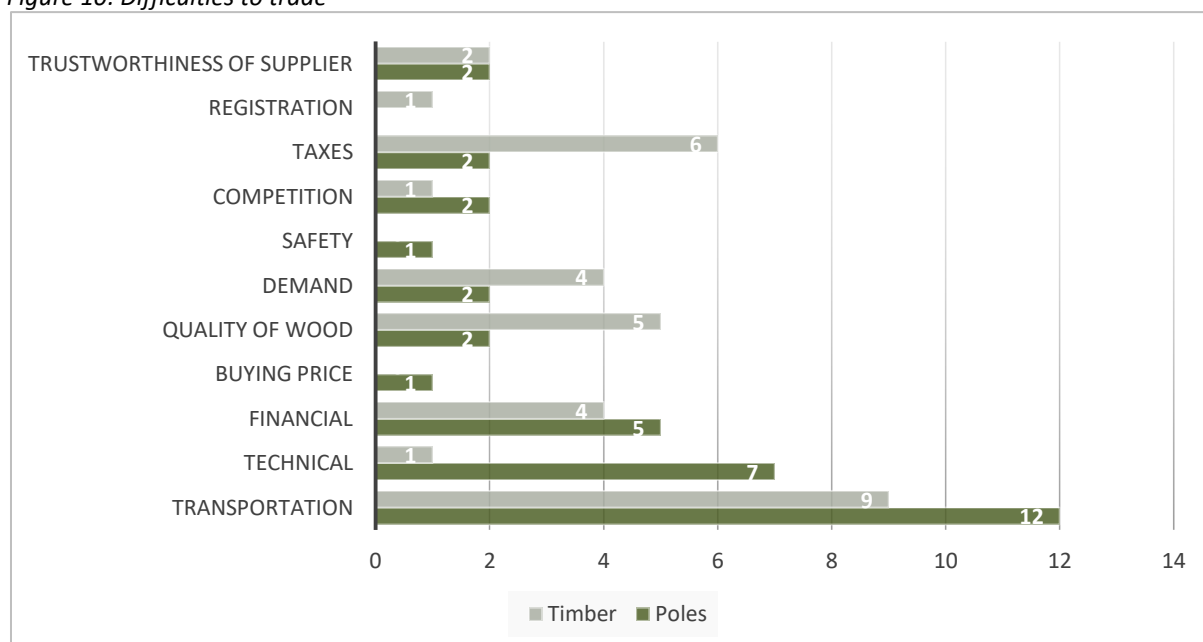
Difficulties to trade

Since structure encompasses not only the direct structure in the value chain, but the whole environment in which the activity takes place, the traders were asked about this environment. Figure 10 gives an overview of the difficulties traders encountered when trading wood. Most of the traders indicated that it is *difficult* to trade wood¹. The most common difficulty to trading wood is transport, as indicated by 21 traders. This is due to the very bad infrastructure in Tanzania, especially from and towards the woodlots. Roads are often just made of sand and rocks, as there are very few tarred roads in Tanzania. Especially in the rain season (when the field work took place) the roads are quite dangerous because of mud and erosion. The main problems for poles traders are the transport and technical problems. Most poles traders indicated that although NFC offers higher prices and provides extra services, the transport to Iringa is too expensive and dangerous and therefore they trade with SHI instead. Getting the wood from the woodlot and skinning the trees is usually done manually,

¹ On a 5-point scale ranging from *very easy* to *very difficult*.

because machines are very expensive and they just don't have the money to buy them. The poles traders indicated this as a technical problem, since they don't have the materials to harvest and skin the trees easily. The problems for timber traders are more diverse, but taxes and quality of wood are indicated as the biggest problems next to transport.

Figure 10: Difficulties to trade



5.2.2 Conduct

The choices made by the traders about their business are called the conduct within the SCP framework. Because the traders in this research were not all members of a collective association and poles and timber have different value chains, the conduct of the individual trader was used. However, linkages within the immediate links in the value chain are important for this research, indicated by individual traders with contracts with suppliers or buyers or have formed associations with some other traders. The indicators for conduct are sales and delivery, income diversification, horizontal and vertical linkage and individual price influence.

Sales and delivery

The traders were asked about the number of poles or pieces of timber they sold on their last delivery and on an average delivery. From Table 5 it is clear that poles traders sell less than timber traders. This is because the volume of a tree is larger than the volume of a piece of timber (which is a cut up tree and thus several pieces of timber comprise one tree). From the standard deviations it can be seen that the volume of sales for timber is more diverse than the volume of sales for poles. This is because traders are dependent on the size of the truck for their sales and timber traders can use trucks of multiple sizes, while poles traders can only use the larger trucks. Traders were also asked how often they trade their products. Most traders indicated to trade wood once or twice a month. Timber traders indicated to trade slightly more often than poles traders.

Table 5: Sales per trader

	Average*	Minimum	Maximum	Observations
Last delivery				
Poles	87 (36)	50	200	15
Timber	1614 (1338)	294	4500	15
Average delivery				
Poles	92 (35)	60	200	14
Timber	1615 (1113)	300	3250	15

* Numbers between brackets are standard deviations

Income diversification

The traders were also asked whether they, or anyone else currently living in their household, had other income sources than trading. For the division amongst poles traders and timber traders see Table 6. Only two poles traders' households are solely depending on the wood trade for their income. This indicates that wood trade is not often depended on as the sole form of income.

Table 6: Number of traders with other sources of income

	Total	Poles	Timber
<i>Only own income</i>	13	6	7
<i>Only other household member</i>	4	2	2
<i>Both own and household member</i>	11	5	6
<i>No other form of income</i>	2	2	0

Horizontal linkage

Horizontal linkages are cooperation between firms or businesses operating at the same level of a value chain, thus who compete for the same inputs and buyers. Table 7 indicates how often a trader would cooperate with other traders. Two of the interviewed timber traders were members of a traders association in Makambako selling at the timber market; therefore they *always* work together with other traders. Most of the traders indicated to work together *sometimes/regularly* with other traders. Cooperation between traders was mostly on the basis of sharing information about the quality and location of wood or borrowing money from other traders.

Table 7: Horizontal linkages

	Poles	Timber
<i>Never</i>	3	3
<i>Sometimes</i>	4	5
<i>Regularly</i>	6	5
<i>Often</i>	0	0
<i>Always</i>	2	2

Vertical linkage

Vertical linkages are formed with suppliers of inputs upstream, or buyers downstream in a value chain. Table 8 indicates how often a trader would cooperate with either his suppliers or his clients. Traders cooperate very little with their clients. Most timber traders *never* cooperate with their clients. Indicated cooperation included price negotiation, credit, borrowing equipment and sharing information. The cooperation with clients was higher for poles traders. Some poles traders cooperate with their client (NFC) on the quantity, quality, delivery times and the prices of poles. Next to this they sometimes get training in how to recognize the quality of the poles.

There is more cooperation with the suppliers for both types of traders. The type of cooperation of poles traders with their suppliers includes information sharing, preparation of the poles by the supplier, credit and borrowing equipment. Some of the timber traders indicated to have a contract with their suppliers, and in exchange teach them to grow good quality wood. Other types of

cooperation of timber traders with their suppliers include credit and sharing information. Overall, the vertical linkage is higher for poles traders than for timber traders.

Table 8: Vertical linkages

	Suppliers		Clients	
	Poles	Timber	Poles	Timber
<i>Never</i>	7	5	8	11
<i>Sometimes</i>	2	3	3	3
<i>Regularly</i>	3	5	0	1
<i>Often</i>	1	0	1	0
<i>Always</i>	1	2	3	0

Individual price influence

Traders could indicate whether they could set their prices individually and if not, who did. In Figure 11 is shown how the prices for the traders were set. All the poles traders indicated that the prices were determined by the clients. This is not surprising as poles traders trade to the big companies and they have fixed prices for the poles they buy (see Box 1). Timber traders had more diverse answers about who influences the prices. From this can be seen that timber traders have more to say about their prices than poles traders, because the latter are dependent on a few big companies while the former have more potential clients.

Figure 11: Set prices



Box 1: How does SHI determine poles prices?

Poles traders have no say in the price they get for their poles, they are price takers. During the interviews at SHI the issue of poles prices came up and it was explained that the big companies usually make an announcement of the kind of poles they want and the price they are going to pay for it, and the poles trader can choose to accept this and sell the poles or not. The criteria on which these prices are based are the prices of the competing processing industries (mainly NFC), the available funds and the demand. This last criterion is important because poles can be different sizes and each size has its own price. If SHI is not interested in a certain size, they will lower the price they pay for it, or at least put their price below the price of their competitor(s) (personal communication, February 2016). Since there are only a few buyers of unprocessed poles in this market and a lot of traders willing to sell, the market for poles can be characterized as an oligopsony.

5.2.3 Performance

How traders conduct their business within their structural environment might influence their performance, measured in profit, threshold difference and subjective well-being. The third part of the SCP-questions asked traders about these variables.

Profit

Prices per pole are higher than prices per unit of timber, but at the same time traders sell more units of timber than poles. It was found that there is more diversity in revenue amongst timber traders than amongst poles trader. The same goes for the buying price. Costs other than buying price are similar for traders with the same product, and are higher for poles traders then for timber traders.

The traders were asked to indicate how much profit they made on an average delivery (see Table 9). From this we can see that also for the profits (although closer together) the timber traders have more diversity than poles traders. The average for timber traders is higher, although slightly skewed by the trader indicating to earn more than 10 million Tanzanian Shilling (TZS) on an average delivery. Traders were also asked about the profit on their last delivery, but not all traders could remember this, and this is not representative of their business on average, therefore for this research the indicated profit on an average delivery will be used as profit variable.

Table 9: Average profit per delivery (x1.000.000 TZS, not for average)*

	Poles	Timber
< 0	1	0
0-1	3	7
1-5	11	7
5-10	0	0
> 10	0	1
Average	1.153.333 (1.217.429)	4.045.871 (1.429.528)

* The averages between brackets not counting the outliers of 11 million and 500.000 TZS

Threshold prices

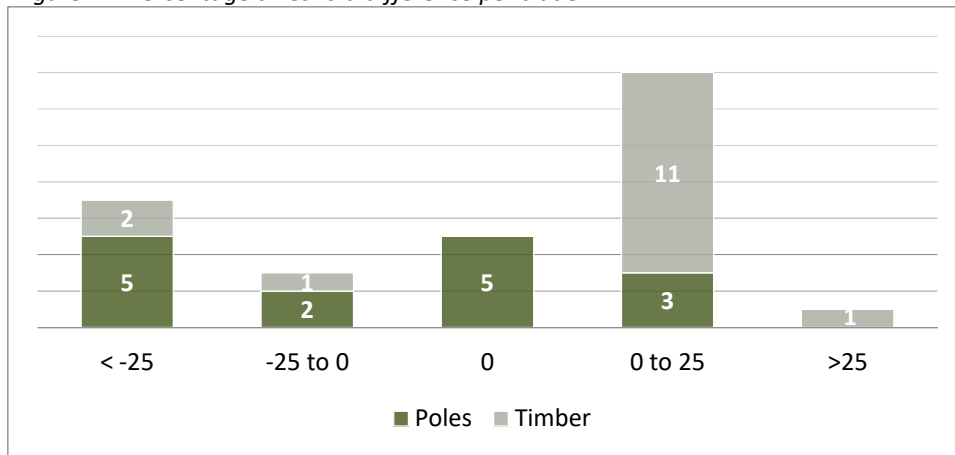
As was shown in the previous section, very few traders indicated they are able to influence their prices. The traders were also asked about their threshold prices of the products they sold in their last delivery. This way there was information about the price they received, and the lowest price they would want to receive (the threshold price). The traders were asked to give the lowest price for which they would like sell their products. The difference between the actual price and the threshold price was named the threshold difference and calculated by subtracting the average threshold price from the average selling price.² A positive threshold difference indicates the trader gets more for his products than he requires. A negative threshold difference is more problematic, as it indicates that the trader sells his products for a lower price than his own minimum threshold, which indicates very low market power for the trader.

Figure 12 gives the average threshold differences for the traders, in percentages of their average selling price. Most of the timber traders have an average threshold difference of 0 to 25% in comparison to their selling price, while the threshold differences for poles are more diverse, with 5 of the traders having a negative threshold difference of over 25% of their selling price. Overall, poles traders have a lower threshold difference than timber traders, indicating lower bargaining power for the poles traders compared to the timber traders³.

² For this calculation the average of the selling price and threshold price of all products a trader sold is taken, to get one measure per trader.

³ Theoretically, a negative threshold difference (selling price below the threshold price) would not be possible, because a trader would not sell his products below his threshold price. Traders interpreted the question as the lowest price for which they would still make a reasonable profit, which means a negative threshold price indicates very low bargaining power for the trader.

Figure 12: Percentage threshold difference per trader

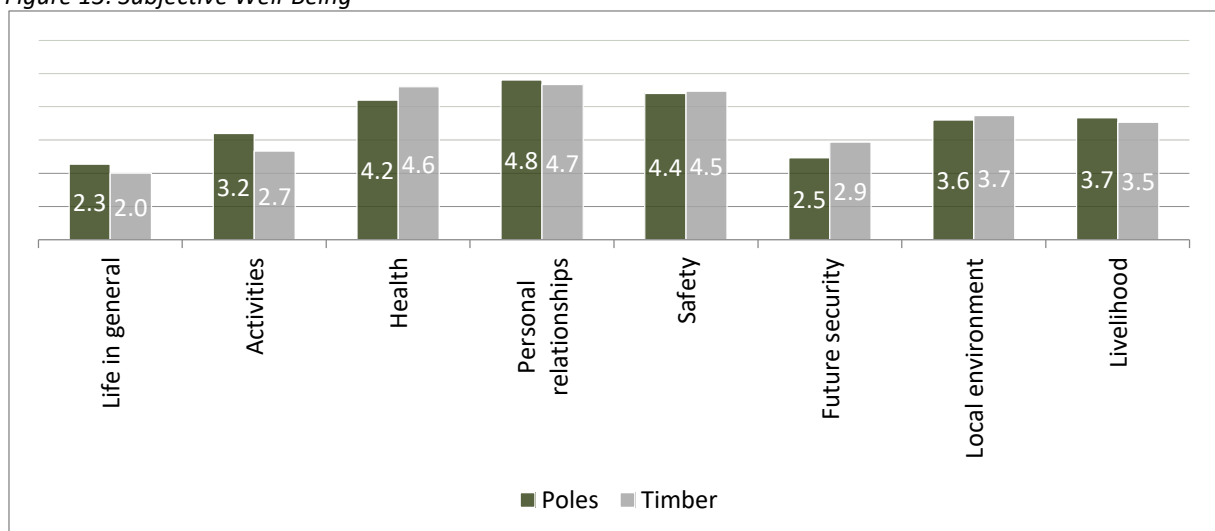


Subjective well-being

Part of the performance in the SCP framework is also the Subjective Well-Being. This indicates what traders think of their quality of life outside of trading. Respondents could rate eight questions on Subjective Well-Being (see chapter 3) on a 5 point likert scale, with a higher score indicating higher wellbeing. The average score across the eight questions is used in the analysis. This average is different from the general life satisfaction questions, because it takes into consideration all factors deemed important within this research, and not just the considerations that influenced the trader in answering one of the Subjective Well-Being questions. Most traders score on average between 3 and 4, which means they are reasonably satisfied.

The individual values indicate the Subjective Well-Being on the specific factors. Figure 13 summarizes the average scores on each factor split up by timber and poles traders. From the figure it seems that poles traders and timber traders do not differ that much from each other in terms of Subjective Well-Being. The traders are most content with their health, personal relationships and safety. They are the least content with their life in general and their future security.

Figure 13: Subjective Well-Being



5.3 EXPECTATIONS

The third part of the questionnaire asked the traders about their expectations for the near future (up until five years from now). This included general expectations about the timber market and specific expectations about their own activities.

5.3.1 General expectations

Traders were asked about their expectations of the demand and supply of wood, the costs of trading and the overall market climate for wood traders. With regard to the general demand expectations, every trader, except 1, expects the demand for wood to increase. The trader who said the demand would decline was a timber trader and believed the construction industry is going to use more and more steel instead of wood for the construction of roofs, which is why he expects the demand for wood to decline. Most of the traders expect an increase in the supply, but one third of the traders expect no change or even a decrease in the supply of wood. A majority of the traders expect an increase of the costs, and this majority is bigger amongst timber traders than amongst poles traders. Regarding the trading climate for wood traders, the poles traders all expect either no change or an improvement, while some of the timber traders expect a deterioration. But overall traders expect an improvement of the trading climate. These findings are in line with a general positive view on the future of the wood market (AFF 2011, Indufor2011, TEITI 2014).

5.3.2 Specific expectations

Traders were also asked about their expectations to the prices, quantities and profits specific to their own situation. Also, the questionnaire ended with the question “Do you expect to change your income generating activities the coming years?”, to indicate whether the trader will continue to trade wood or not. Especially these specific expectations will tell us something about the link between a traders SCP framework and their expectations.

The traders were asked about their expectations towards the prices they pay for their supply and the prices they would get from their clients. Most traders expect increases in the prices they pay for their supply and they get from their clients. For the profits we see also a trend in positive expectations, see Figure 14: Profit and sales expectations. Most of the traders expect an increase in profits; only one timber trader expects a slight decline in profits in the coming years. For the sales expectations this research looked at the expectations about the sales to the main client, which either doesn’t change or is expected to increase for all traders (Figure 14). Also the expectations about future income generating activities are positive, as seen in Figure 15: Future Expectations. Most traders expect to either increase trade or their other activities, only 2 traders expect to stop trade in the near future.

Figure 14: Profit and sales expectations

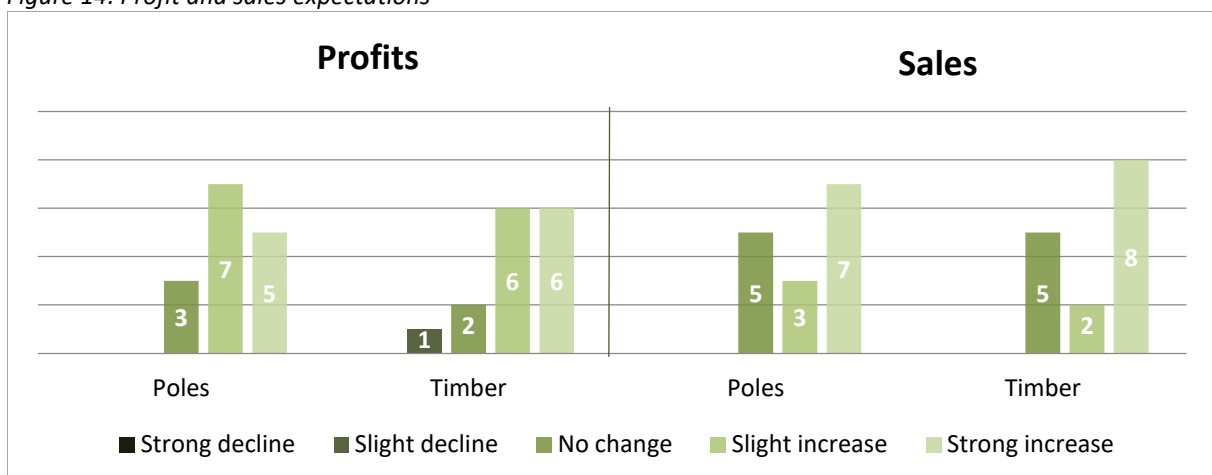
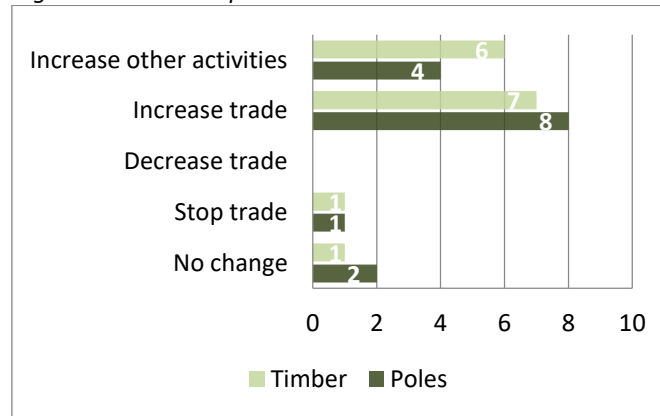


Figure 15: Future Expectations



5.4 SUMMARY

The previous sections have indicated that there are differences as well as similarities between the poles and timber traders in the Iringa region in Tanzania. This section will shortly summarize these differences and similarities within their structure, conduct, performance and expectations.

The traders' structure is similar upstream in the value chain. Most traders get their wood from woodlots, meaning timber and poles traders compete, to some extent, for the same inputs. However, the structure is entirely different downstream in the value chain, because poles traders mostly sell to the big wood processing industries, while the clientele of the timber traders is much more diverse. This difference of clients is, together with the fact that poles and timber are two different products, the main difference in structure between the two types of traders. This also results in a difference in buyer power each type of trader faces. While timber traders face little buyer power because they trade with multiple clients, poles traders mainly sell to a few big clients and thus face much more buyer power. With regard to the difficulties of trade, there are also differences and similarities. The main difficulty for all of the traders is the transport of the wood. While poles traders indicate the hard manual work as another big problem, timber traders indicate taxes as a difficulty. Another general problem in the wood market, indicated by the traders as well as in other interviews, is the quality of the wood. Woodlots often do not have great management, resulting in smaller trees of lesser quality. Poles traders can only sell wood of a certain quality, otherwise it will not be accepted by the clients, while timber traders are more flexible in the quality they can use. This makes high quality wood scarce, and thus competition for inputs amongst poles traders higher than amongst timber traders.

Poles and timber traders do not differ much in their conduct with respect to their income diversification or the horizontal linkages with other traders. With regard to the vertical linkages, the poles traders cooperate more with their clients than the timber traders. Also the amount of deliveries does not differ much, timber traders have slightly more deliveries than poles traders. However, the amount of products sold per delivery does differ between poles and timber traders. Timber traders have more variance in their products per delivery than poles traders. This is due to the fact that trucks transporting timber can have multiple sizes, while trucks transporting poles have to be large enough to transport a 12m pole. There is also a difference in the amount of investments of the traders, where timber traders have more investments (mostly in processing facilities) than poles traders. The biggest difference in the conduct of poles and timber traders is the way they set prices. Because poles traders are dependent on a few big clients, they are price takers, while timber traders indicate they have some influence in their selling prices. This is also seen in the difference in threshold differences, because poles traders mostly have a negative threshold difference, and thus

sell below their indicated threshold price, and timber traders mostly have a positive threshold difference.

Regarding the performance of the traders there is a difference in the spread of the revenues, costs and profits. Timber traders' revenues, costs and profits are more diverse than those of poles traders. Per unit the revenues costs and profits are lower for timber traders, but their volume of sales per delivery is much higher. There is no difference in the subjective well-being between the two types of traders, and traders are most satisfied with their health, personal relationships and safety, and least satisfied with life in general and their future security.

The general expectations of the traders do not differ between the poles and timber traders. The traders expect an increase in both demand and supply of wood products, an increase in costs of trading and an improvement of the trading climate. The traders place quite high trust in their clients, with SHI scoring a bit lower than other clients (of poles as well as timber traders). Lastly, traders are positive about their future; most traders expect an increase in their sales and price and expect to extend their current income generating activities, either wood trade or their other activities.

From this qualitative analysis of the data it seems that the structure of the traders' market, and especially the demand concentration for the output, has a lot of influence on the conduct, performance of the different type of traders. Since the expectations were not much different between the traders, these might not be influenced by the SCP of the traders that much. The next chapter will investigate these relationships quantitatively.

6. QUANTITATIVE ANALYSIS

This chapter will explore the relationships between the structure, conduct, performance and expectations of the small-scale wood traders, as expected from the literature of the traditional SCP framework and its extensions. It was found in the previous chapter that there are two major differences between timber and poles traders, particularly in the buyer power the traders faced and the volume of sales of the traders. In the remainder of this chapter it will be tested whether these and other differences in structure and conduct influence the performance and expectations of the traders. Regarding the performance it was found that the spread of the costs, revenues and profits was higher for timber traders than for poles traders, which could be the result from the diversity of the number of sales. However, from the qualitative analysis there seemed to be no difference in expectations between the traders, so it might be that a difference in structure or conduct does not affect expectations. Most of the descriptive statistics of the variables have been reported in chapter 5, but an overview of the descriptive statistics of the variables used for this analysis can be found in the appendix.

After testing whether or not the differences between poles and timber traders expected from the qualitative analysis are significant (6.1) the remainder of the chapter will be devoted to finding out how the different pillars from the SCP framework and the expectations of the traders are linked (6.2-6.5). For the performance part we will look into the profits, the threshold difference and the subjective well-being of the traders. With regard to the expectations we will look into the expectations traders have about their profits, sales to their main client (SHI or other clients) and their expectations about the future of their income generating activities.

6.1 POLES VS. TIMBER

To see whether the differences between poles and timber traders are significant, it is tested whether the measures of central tendency (mean or frequencies) are different between the two sub groups. Two different tests were used. First, for the variables with continuous or ratio data the Welch's t-test

was used. This test can be used to compare groups that approximate a normal distribution, but have unequal variances. Since the variance of sales per delivery differs much between timber and poles traders, this test is preferred over the standard student's t-test, which does not account for this inequality of variance and therefore is more prone to type I error (Ruxton, 2006). Since the Welch's t-test has similar power in cases where the variance is equal, this test is also used for comparing the average profit and the threshold difference between poles and timber traders (Ruxton, 2006). The second test to be used is the Mann-Whitney-Wilcoxon (MWW) test.⁴ This test has a similar null-hypothesis as the Welch's t-test or the student's t-test, but it conducts the test on ranks instead of the measured values. Therefore the MWW is also appropriate to use when the sample is drawn from a non-normal distribution, especially if the data is non-continuous (De Winter and Doudou 2010). This test is used to compare the ordinal and binary variables between the two groups. It is also used to test whether the Subjective Well-Being is significantly different between timber and poles traders. Although this is a range data, it is composed of likert-scale data with positively skewed answers and therefore this test is more appropriate. The results of these tests are reported in Table 10.

Table 10: Poles vs. timber traders*

Variable		Poles		Timber		Test	Test statistic (p-value)
		Obs.	Mean	Obs.	Mean		
Sales per delivery		14	19.857 (34.818)	15	1.615 (1,112.502)	<u>Welch's t-test</u> $H_0: \text{mean}(\text{poles}) = \text{mean}(\text{timber})$	-5.300**
Average profit		15	1,153,333 (734,717.300)	15	2,067,560 (2,790,698)		-1.227
Threshold difference		10	-40.578 (83.262)	15	-1.386 (32.218)		-1.419*
Buyer power		15	2.667 (.617)	15	1.400 (0507)	<u>MWW</u> $H_0: \text{ranked mean}(\text{poles}) = \text{ranked mean}(\text{timber})$	4.094***
Supply concentration		15	1.133 (.352)	15	1.200 (.414)		-.482
Competition		15	1.800 (.414)	14	1.571 (.514)		1.306
Income diversification		15	2.200 (.676)	15	2.400 (.507)		-.780
Horizontal linkages		15	2.600 (1.242)	15	2.533 (1.246)		.217
Vertical linkages	Supply	14	2.071 (1.328)	15	2.400 (1.352)		-.735
	Clients	15	2.200 (1.656)	15	1.333 (.617)		1.400
Set prices individually		15	0.000 (0.000)	15	.400 (.507)		-.396
Subjective well-being		15	3.575 (0.612)	15	3.575 (.635)		-0.396
Profit expectations		15	4.133 (.743)	15	4,133 (.915)		-0.201
Sales expectations		15	4.133 (.915)	15	4.200 (.941)		-0.227
Future Income		15	2.467 (.640)	15	2.400 (.632)		0.326

* Numbers between brackets are standard errors

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

From the table it can be concluded that timber and poles traders are significantly different in the buyer power they face and their sales per delivery. The table indicates that the sales per delivery for timber are significantly higher than the sales per delivery for poles. However, it does not clearly indicate that the variance of sales per delivery is higher for timber traders than poles traders. Levenes test for unequal variances was used to detect this difference, and the test ($F = 40.837$; $p = 0.000$) indicates clearly that the variance between timber and poles traders is different. The traders

⁴ This test is also known as the Wilcoxon rank sum test or Mann-Withney U test.

also differ significantly in the buyer power they face, with poles traders facing higher buyer power than timber traders.

However, the traders do not differ significantly on any of the other variables, which means that the fact that they trade poles or timber does not significantly influence any of their other conduct, performance or expectation variables. The next sections will look into the links between structure, conduct and performance variables and the expectations of the traders. Where possible, it is tested whether the relationships are different for timber and poles traders, especially the relations that include buyer power or sales per delivery.

6.2 EXPLAINING CONDUCT

According to the classical SCP-framework, the structure of a market is exogenous and influences the conduct in that market, and the conduct influences the performance. Therefore the first model that will be tested is:

$$1) \text{ Conduct}_i = \beta_0 + \beta_1 \text{Structure}_i + \beta_2 \text{Control}_i + \varepsilon^5$$

6.2.1 Sales per delivery

Several sub-models have been tested, which are reported in Table 11: Explaining links conduct. Model 1 is tested using Ordinary Least Squares (OLS), since the dependent variable *sales per delivery* is continuous. Here we see that the coefficient for both buyer power and competition are significant and negative. This means that traders facing higher buyer power or more competition have lower sales. This result was robust when the control variables *education* and *experience* were added to the model.

However, it was found that for buyer power as well as for sales per delivery there are large differences between poles and timber traders, and therefore we also introduce the dummy variable for the type of trader and the interaction variables *buyer power * type of trader* to see whether the found relationship differs between poles traders and timber traders. The results of these tests are reported in Table 12.

Since buyer power is an ordinal variable where the distance between two variables cannot be compared (e.g. a trader assigned high buyer power does not necessarily face twice as much buyer power as trader assigned low buyer power), the coefficients cannot be literally interpreted. Only the sign of the coefficients can tell something about the relationship between buyer power and sales per delivery. In column 1 the coefficient for buyer power is significant. In column 2 both coefficients for buyer power and type of trader are significant, indicating an additive difference in the relationship between buyer power and sales per delivery for the different groups. The model in column 3 is the most interesting though, because the interaction variable is significant and positive, while the coefficient for buyer power is negative. This result is robust when competition is added to the model. To see what this means the equation of model 3 will be split in two equations: one for the poles traders (type = 0) and one for the timber traders (type = 1), using the results from model 3:

⁵ The control variables included are *education* and *experience*.

Table 11: Explaining links conduct*

Regression method:	OLS	Ordinal logit					Logit	
Dependent variable:	Sales per delivery	Income diversification	Horizontal linkage	Vertical linkages			Set prices individually	
				Supply		Client		
Independent variables:	(1)	(2)	(3.1)	(4.1)	(4.2)	(4.3)	(5)	(6.1) (6.2)
Buyer power	-531.975** (222.350)	-.020 (.453)	.361 (.424)	-.738 (.462)	-.549 (.525)	-.639 (.537)	.266 (.458)	-1.664* (.972) -1.799 (1.185)
Supply concentration	412.237 (491.944)	.423 (.958)	.258 (.889)	2.339** (1.179)	2.949** (1.467)	1.814 (1.700)	.095 (.977)	-.174 (1.308) .249 (2.918)
Competition	-818.874* (417.078)	-.160 (.795)	(.426) (.757)	1.354 (.873)	1.557* (.916)	1.667* (.937)	.644 (.826)	-1.758 (1.247) -2.288 (1.501)
Education						-.139 (.747)		.592 (1.488)
Experience					-.508 (.681)	.105 (.090)		-.167 (.157)
Constant	2920.275** (1116.851)							4.658 (3.459) 5.047 (3.774)
F-statistic [P-value]	3.52 [.0304]							
R ²	.3053							
Log likelihood		-24.948	-36.895	-34.106	-33.815	-33.101	-31.136	-11.726 -10.606
Cut #1		-2.424 (2.200)	.402 (1.945)	3.073 (2.391)	3.240 (2.449)	3.618 (2.476)	-.8819 (3.2064)	
Cut #2		0.840 (2.115)	1.872 (1.989)	4.004 (2.426)	4.198 (2.492)	4.665 (2.529)	.2650 (.5674)	
Cut #3			3.98 (2.092)	5.708 (2.566)	5.907 (2.635)	6.390 (2.671)	3.1975 (3.1892)	
Cut #4				6.166 (2.650)	6.353 (2.715)	6.801 (2.733)	.9384 (3.1808)	
LR χ^2 [P-value]		0.25 [.9684]	1.12 [.7730]	98.82 [.0317]	9.41 [.0517]	10.84 [.0548]	0.88 [.8291]	6.12 [.1060] 8.36 [.1376]
Pseudo R ²		.0051	.0149	.1145	.1221	.1406	.0140	.2069 .2826
N	28	29	29	28	28	28	29	29 29

*Numbers between brackets are standard errors.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 12: Explaining sales per delivery*

Dependent variable: <i>Sales per delivery</i>				
Independent variable:	1	2	3	4
<i>Buyer power</i>	-464.510* (228.745)	562.534** (258.267)	-10.824 (299.824)	43.487 (294.756)
<i>Competition</i>				461.641 (351.135)
<i>Type of trader</i>		2262.473*** (439.452)	-376.791 (979.949)	-369.477 (976.359)
<i>Buyer power * Type of trader</i>			1,346.935*** (459.544)	1,522.050*** (498.857)
Constant	1824.727*** (504.384)	-1435.02* (729.184)	121.235 (832.749)	-883.514 (1114.055)
F-statistic [p-value]	4,12 [0.052]	17.26 [.000]	17.73 [.000]	14.67 [.000]
R ²	.133	.570	.680	.718
N	29	29	29	28

* Numbers between brackets are standard errors;

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$ Poles: $\text{sales per delivery} = 121 - 10 * \text{buyer power}$ Timber: $\text{sales per delivery} = -226 + 1,336 * \text{buyer power}$

Looking at these equations, the most striking change is the change of the sign of the coefficient. For poles the relationship between buyer power and sales is negative, whilst it is positive for the timber traders. This means that for the timber traders, they sell more units of timber per delivery when facing higher buyer power, while poles traders sell less. When running two different regressions for each group (see Table 13), the relationship is significant for the timber traders, but not for the poles traders. This makes sense, because due to the transport of the product, the poles traders are not entirely free in choosing how many poles to sell per delivery. Whilst timber traders are more free in the amount of sales per delivery, because they can choose from multiple truck sizes. However, since these regressions are run on small groups ($n=14$ and $n=15$) there is a chance of a type II error, simply due to too little data.

Table 13: Sales per delivery relationship for timber and poles traders*

Dependent variable: <i>Sales per delivery</i>		
Independent variable:	<i>Poles</i>	<i>Timber</i>
<i>Buyer power</i>	-10.824 (16.144)	1,336.111* (482.616)
Constant	121.235* (44.839)	-255.556 (715.834)
F-statistic [p-value]	.45 [.515]	7.66 [.016]
R ²	.036	.371
N	14	15

* Numbers between brackets are standard errors;

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

A similar test with the dummy variable and interaction variable was done for the relationship between competition and sales, however it was not found that there is a difference in this relationship between poles and timber traders.

6.2.2 Other conduct variables

The other models in Table 11 are tested using (ordered) logistic regression, since the dependent variables are ordinal or binary. In these models, a positive relationship means an increase in the odds of being in the highest category compared to the other categories. Looking at these models, there

were no significant relationships between the structure variables and *income diversification*, *horizontal linkages* and the *vertical linkages with the clients*. Based on this data no conclusions on links between the structure and these variables can be made. Regarding the relationship between structure and the supply linkages, significant coefficient for supply concentration indicates that traders who face a more concentrated supply cooperate with their suppliers more often. However, this relationship is not robust when controlled for the education and experience level of the traders. When controlled for the experience level of a trader, the significant coefficient for competition indicates that traders facing higher competition cooperate more with their suppliers.

The coefficient of buyer power is significant in model 5.1, indicating that traders who face higher buyer power have a higher chance of not being able to influence their selling prices. This result is robust when either one of the two control variables is introduced in the model. However, when both control variables are added to the model the result becomes insignificant, which might just be the result of adding too many variables to the model which increases the variance of the estimates and thus biases the results.

The structure thus affects sales per delivery, the supply linkages and the way traders set prices. The next part of this chapter will look into the influence of structure and conduct on performance.

6.3 EXPLAINING PERFORMANCE

Still following the traditional framework, in which performance is influenced by the exogenous structure and endogenous conduct; the next model will look into the relationship between the structure and conduct variables and profit, threshold difference and subjective well-being for the traders, using Ordinary Least Squares, since the dependent variables are all continuous or range data. There are several models being tested. The first model contains a performance variable (profit, threshold difference or well-being) depending on buyer power, supply concentration and competition. The second model contains the performance variable dependent on the conduct variables and the third model includes both structure and conduct indicators in the regression. All models are extended with the control variables to see whether found effects are robust. When possible, found effects of sales and buyer power on the performance variables are looked into further, to see whether the relationship differs between the different types of traders. The models to be tested:

- 1) $Performance_i = \beta_0 + \beta_1 Structure_i + \varepsilon$
- 2) $Performance_i = \beta_0 + \beta_1 Conduct_i + \varepsilon$
- 3) $Performance_i = \beta_0 + \beta_1 Structure_i + \beta_2 Conduct_i + \varepsilon$

Table 14: Explaining performance* shows the results of the tests for the different performance indicators *average profit*, *threshold difference* and *subjective wellbeing*. Each performance indicator will be discussed separately.

6.3.1 Profit

First the effect of structure and conduct on average profit is tested. From model 1.1 in Table 14 we cannot reject the null hypothesis that the structure variables have an effect on average profit. In model 1.2, the coefficient for sales per delivery is significant and positive, indicating that traders with a larger volume of sales per delivery earn a higher profit on an average delivery. Including both the structure and conduct variables in model 1.3 we see that the coefficients for buyer power and competition are significant as well. This might be due to the results from the previous section that buyer power and competition have a negative effect on sales per delivery.

Table 14: Explaining performance*

Dependent variable:		Profit on average delivery			Threshold difference				Subjective Well-Being				
Independent variables:		(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(2.3)	(2.4)	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)
Structure	Buyer power	15,585 (488,591)		907,090 * (1,053,991)	-15.809 (14.558)		3.996 (8.029)		.050 (.138)		.064 (.167)		
	Supply concentration	671,859 (1,074,034)		-907,508 (486,283)	-56.612* (29.115)		7.344 (16.574)	6.670 (14.553)	.568* (.303)		.688* (.361)	.633* (.351)	.203 (.457)
	Competition	240,312 (876,822)		1,611,984* (902,335)	7.924 (25.114)		7.325 (16.422)		.170 (.248)		.522 (.309)		
Conduct	Sales per delivery		1,080*** (344.573)	1,593*** (392.791)		.004 (.005)	.006 (.006)			.0002* (.0001)	.0003** (.0001)	.0001 (.0001)	.0001 (.0001)
	Income diversification		828,556 (582,666)	734,851 (593,287)		6.567 (10.663)	-1.982 (11.292)			.187 (.203)	.088 (.203)		
	Horizontal linkages		-263,335 (352,756)	-211,289 (378,152)		-2.239 (5.897)	-6.516 (6.371)			-.024 (.123)	.023 (.130)		
	Supply linkages		56,077 (316,343)	223,500 (362,595)		-9.591* (4.847)	-9.712 (6.135)	-10.566** (4.158)		-.128 (.110)	-.249* (.124)	-.156* (.090)	-.148 (.093)
	Client linkages		310,725 (293,661)	201,642 (287,412)		.010 (4.795)	.666 (4.962)			.101 (.102)	.143 (.099)		
	Indiv. price influence		-533,330 (852,708)	398,225 (911,512)		21.033 (13.264)	28.868* (14.508)	24.153** (11.421)		-.278 (.298)	1.512 (.313)		
Control	Education												.252 (.187)
	Experience												.029 (.030)
Constant		438,960 (2,349,189)	-1,122,968 (1,733,878)	5490544** (2,809,431)	66.938 (64.637)	-3.479 (28.254)	-10.05871 (45.84281)	3.929 (16.685)	2.516 (.664)	3.165*** (.605)	-.050 (.963)	3.062*** (.376)	2.742 (.451)
F-statistic [P-value]		0.15 [.9310]	3.11 [.0244]	2.92 [.0274]	1.82 [.1759]	1.93 [.1382]	1.71 [.1908]	4.02 [.0218]	1.28 [.3016]	1.26 [.3179]	1.78 [.1473]	2.78 [.0630]	2.42 [.0780]
R ²		.0173	.4704	.6071	.2145	.4193	.5618	.3760	.1335	.2645	.4845	.2578	.2959
N		29	28	27	24	23	22	24	29	28	27	28	28

*Numbers between brackets are standard errors.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

To see whether buyer power and sales per delivery have a separate effect on the profit of an average delivery, the model is tested with interaction variables in Table 15. In model 3, the coefficient of sales and both interaction variables are significant. However, the coefficient for sales per delivery is now negative, whilst the coefficients for the interaction variables are positive. This means that traders with higher sales per delivery have a lower profit, but this effect diminishes at higher levels of buyer power or competition. At the same time the profit is higher when the trader is faced with higher buyer power, and this effect increases with the volume of sales. The profit is lower for a trader who faces higher competition, but this effect decreases with higher sales. There is thus a complex relationship between buyer power, competition, sales and profit for these traders.

Looking at model 4 in Table 15 we see that this relationship is slightly different for poles traders than for timber traders. Where for timber traders the same coefficients are significant with similar signs, for poles traders the coefficients are different. The coefficient for competition and the interaction between competition and sales are not significant for poles traders, indicating that we cannot reject the null hypothesis that there is no effect of competition on profit for poles traders. The relationship between buyer power and profit is also different. The positive coefficient indicates that, for poles traders, the ones who face higher buyer power have with higher profits. But this effect diminishes when poles traders sell more products on a delivery, seen from the significant negative coefficient for the interaction variable.

Table 15: Explaining profit*

Dependent variable: Profit on an average delivery					
Independent variable:	(1)	(2)	(3)	(4)	
				Poles	Timber
Buyer power	510,257.8 (497,157.9)		144,853.2 (305,042.9)	6,751,118** (2,102,947)	65,546.62 (2,178,700)
Competition		-343,717.7 (1,020,978)	-509,440.5 (613,450.8)	-5,039,966 (2,945,215)	-1,042,122 (1,741,097)
Sales	644.883 (1,199.707)	-771.897 (1,030.881)	-7,092.438*** (1,322.943)	34,236.17 (101,649.4)	-7,398.138** (2,261.296)
Buyer power * sales	331.220 (616.636)		2,379.95*** (453.069)	-60,813.56** (19,549.22)	2,387.75** (930.361)
Competition * sales		1,234.008* 613.994	2,757.777*** (439.454)	73,204.51 (41,338.78)	2,965.826*** (775.547)
Constant	-448,573.4 (1,235,485)	1,281,905 (1,888,861)	1,301,715 (1,361,694)	-8,713,389 (8,675,133)	2,198,856 (4,913,517)
F-statistic [p-value]	5.49 [.005]	6.78 [.002]	20.22 [.000]	2.81 [.094]	10.91 [.002]
R²	.397	.459	.821	.637	.872
N	29	28	28	14	14

*Numbers between brackets are standard errors.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

6.3.2 Threshold difference

Another interesting variable indicating performance is the threshold difference, indicating the difference between the selling price and the threshold price in percentages of the selling price. Table 14 presents the results of the regressions to test whether structure or conduct have an effect on the threshold difference. In the first model (2.1) the coefficient for supply concentration is significant and negative, indicating that traders who face higher supply concentration have a lower threshold difference. However, this relationship is not robust when conduct indicators and/or the control variables are added to the model. Model 2.2 indicates a negative relationship between supply linkages and the threshold difference, meaning that traders who cooperate less with their suppliers usually have a higher threshold difference. This might be due to the fact that when a trader cooperates with his supplier he sometimes has to sell when prices are lower to maintain this

relationship with the supplier. In model 3 the effect of supply concentration is insignificant, indicating that the found effect in model 2.1 was probably due to the effect supply concentration has on supply linkages. In the last two models for threshold difference there is also a positive relationship between threshold difference and the individual price influence, indicating that traders who indicate to have more individual influence over their selling prices have a higher threshold difference. This means that for traders who indicate to have influence over their selling prices the difference between the price they want and the price they get is not as big as for traders who indicate to have little influence over their selling price, when the price is lower than what they want to get. Or the traders with more influence more often get a price higher than the price they want for their products.

6.3.3 Subjective Well-Being

A broader indicator for performance, including the livelihood instead of only the business performance of the trader, is the Subjective Well-Being variable. The last models in Table 14 give the results from the regressions of the structure and conduct variables on Subjective Well-Being. In model 3.1 there is a significant relationship between the structure indicator supply concentration and Subjective Well-Being, indicating that traders with higher supply concentration have a higher Subjective Well-Being. In 3.2 the coefficient for sales is significant and positive, indicating that traders with higher volumes of sales have a higher Subjective Well-Being. In the third model, with both the structure and conduct indicators included in the model, also the coefficient for supply-linkages is significant. However, this is due to the relationship between supply concentration and supply linkages found in the previous section, see model one in Table 16 below. In this model the coefficient for the interaction variable is insignificant, as well as the coefficient for supply linkages. Comparing the table below to model 3.4 in Table 14 it is seen that when the interaction variable is accounted for in the model, the coefficient for sales becomes significant again. From it can be concluded that supply concentration (structure) and sales (conduct) have a positive effect on Subjective Well-Being.

Table 16: Explaining Subjective Well-Being*

Dependent variable: <i>Subjective Well-Being</i>			
Independent variable:	(1)	(2)	
		<i>Poles</i>	<i>Timber</i>
Supply concentration	1.558** (.700)	1.382** (.536)	-.452 (.574)
Sales per delivery	.0002* (.0001)	-.003 (.004)	.0004** (.0001)
Supply linkages	.238 (.275)	-.149 (.111)	.125 (.168)
Supply concentration * Supply linkages	-.309 (.204)		
Constant	1.930** (.833)	2.693** (.823)	3.156*** (.453)
F-statistic (p-value)	2.77 [.051]	3.81 [.052]	2.81 [.090]
R²	.325	.560	.434
N	28	13	15

*Numbers between brackets are standard errors.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

However, since the variance of sales per delivery is different between poles and timber traders, separate regressions of the relationship between sales and Subjective Well-Being are run and reported in the second model of Table 16. Here we see large differences between the poles and timber traders. While for the poles traders the coefficient for supply concentration is significant, for timber traders the coefficient for sales is significant. This indicates that the Subjective Well-Being of the poles traders is related to the level of supply concentration faced, and the Subjective Well-Being for the timber traders is related to the amount of sales. Since in the theory of the determinants of

Subjective Well-Being income is often positively correlated, above relationship were also tested with profit as a control variable. Profit alone is positively correlated with Subjective Well-Being ($t=2.15$ and $p=0.040$), but when added to models 1 and 2 in Table 16 the coefficient for profit was insignificant and it did not change the model drastically. The found relationships are thus also robust for profits.

Thus some of the structure and conduct indicators have a relationship with the performance indicators. Mostly the conduct correlates with performance, confirming the causal chain of the traditional SCP framework. The next section will look into the separate effects of structure, conduct and performance on expectations.

6.4 EXPECTATIONS

Expectations are not a part of the traditional SCP-framework, however Panagiotou (2006) devised a theory in which managerial cognitions, which can also be seen as the expectations of the manager, are shaped by the structure, conduct and performance of a business. In turn, these expectations also shape the conduct, but this relationship will not be tested here, because we only have cross-sectional data and this is a feedback relationship. Since the profit expectations and the sales expectations consist of a 5 point Likert scale variables and the future expectations consists of a 3 point ordinal scale variable, the ordinal logistic regression is used to fit these models instead of OLS regression. This is done because a model with an ordinal dependent variable violates the assumption of a normally distributed error term, which means OLS estimators will be biased. The models that will be tested are:

- 1) $Expectations = \beta_1 Structure + \varepsilon$
- 2) $Expectations = \beta_1 Conduct + \varepsilon$
- 3) $Expectations = \beta_1 Performance + \varepsilon$
- 4) $Expectations = \beta_1 Structure + \beta_2 Conduct + \beta_3 Performance$

Table 17 shows the results of the regressions. Only the coefficient of horizontal linkages in model 1.2 is significant. Converting this log odds into the odds ratio gives us an increase of the odds ratio of 2.590 of a trader answering *strong increase* when the variable horizontal linkages is one unit higher, keeping all other variables constant. To see whether this result can be generalized to all categories, the model was tested for the proportional odds assumption with a likelihood ratio test. The null hypothesis that all coefficients are the same was not rejected ($\chi^2=6.21$ and $p=.399$), which means that traders have the same increase in odds ratio of 2.590 when horizontal linkages increases by one unit to have answered a higher category answer, regardless of which category is compared to the other categories. In other words, the odds that a trader expects to increase his sales in the near future are higher if at the moment of the questionnaire he cooperated a lot with other traders. However, although this is a significant increase in odds ratio, the model is not a good fit (insignificant $LR\chi^2$ and low pseudo R^2).

Logistic regressions were also run for the three expectations indicators including all three the SCP pillars. For sales and future expectations the coefficients were all insignificant, but model 2.4 for profit revealed some significant results. When controlling for all indicators there are some significant coefficients, indicating that changes in buyer power, competition, sales per delivery, horizontal linkages, supply linkages, individual price influence, average profit and threshold difference affect the odds of a trader indicating to increase his profit in the near future.

Table 17: Predicting expectations*

Dependent variable:	Sales Expectations			Profit Expectations			Future Income			
Independent variables	(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(2.3)	(2.4)	(3.1)	(3.2)	(3.3)
Buyer power	.275 (.439)			.178 (.407)			2.368** (.991)	.025 (.447)		
Supply concentration	.354 (1.022)			.554 (.888)			1.734 (1.750)	.593 (1.012)		
Competition	.422 (.777)			-.194 (.760)			4.375** (2.227)	.948 (.808)		
Sales per delivery		.0004 (.0004)			.0003 (.0004)		.003*** (.001)		-.0002 (.0004)	
Income diversity		.476 (.628)			-.329 (.654)		.496 (1.123)		.067 (.690)	
Horizontal linkages		.952** (.470)			.356 (.391)		-1.257* (.742)		-.444 (.425)	
Supply linkages		-.217 (.372)			-.514 (.371)		-1.386* (.769)		-.100 (.363)	
Client linkages		.225 (.321)			.522 (.344)		.727 (.513)		.227 (.356)	
Individual price influence		.300 (.960)			1.437 (.989)		5.751*** (2.191)		.689 (1.012)	
Average profit			5.41e-08 (1.62e-07)			-2.87e-07 (2.16e-07)	-1.63e-06*** (5.87e-07)			-1.76e-08 (1.91e-07)
Threshold difference			-.025 (.018)			-.009 (.009)	-.075** (.034)			.005 (.006)
Subjective Well-Being			.013 (.760)			.324 (.658)	-.543 (1.210)			.708 (.718)
Cut 1[#]	1.061 (2.143)	2.952 (1.927)	-.435 (2.730)	-2.670 (.203)	-3.005 (2.135)	-2.600 (2.547)	3.903 (5.220)	-1.096 (2.305)	-3.704 (2.242)	2.534 (2.514)
Cut 2[#]	1.789 (2.162)	3.850 (1.985)	.488 (.733)	-.655 (2.036)	-1.156 (1.943)	-.556 (2.384)	8.425 (5.316)	2.265 (2.197)	-1.004 (2.036)	-.102 (2.517)
Cut 3[#]				1.212 2.052 (1.947)	1.263 (1.947)	1.476 (2.394)	12.578 (5.700)			
Log Likelihood	-29.251	-25.540	-24.040	-33.074	-29.016	-27.382	-13.881	-22.689	-23.012	-22.022
n	29	28	25	29	28	25	22	29	28	25
LR χ^2 [P-value]	0.76 [.0859]	5.99 [.425]	3.86 [.277]	0.67 [.881]	4.47 [.577]	2.79 [.426]	22.33 [.034]	1.64 [.0651]	3.81 [.702]	1.74 [.629]
Pseudo R²	.013	.105	.074	.010	.076	.048	.4458	.035	.077	.038

* Numbers between brackets are standard deviations;

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

For sales and future expectations there were only 3 levels, for profit expectations there were 4 levels.

When a trader has indicated higher levels of horizontal linkages and supply linkages, a higher profit or a higher threshold difference the negative coefficient indicates that for each of these indicators a unit increase will lower the odds that a trader expects to increase his profit, holding all other variables constant. This indicates that traders that already have a well established business, cooperating with other traders and their suppliers and already earning a high profit, have lower expectations about their future profit, then for traders whose business is less established. A unit increase in buyer power, competition, sales or individual price difference will increase the odds that a trader expects to increase his profit in the near future, holding all other variables constant. For this model a likelihood ratio test was done to test the proportional odds assumption. The results ($\chi^2=17.66$ and $p=.776$) indicate that the results of this model hold when comparing each level of the indicator for profit expectations to the lower levels.

6.5 SUMMARY

This chapter has quantitatively tested the relationships between structure, conduct and performance according to the general relationships stated in chapter 4. It follows the traditional framework, in which the exogenous structure affects conduct and conduct in turn affects performance. Following the model of Panagiotou (2006), it was tested whether expectations were influenced by structure, conduct or performance separately, or a combination of the three. The general relationships tested:

- 1) $Conduct = b_1 + b_2 Structure$
- 2) $Performance = b_1 + b_2 Structure + b_3 Conduct$
- 3) $Expectations = b_1 Structure$
 $Expectations = b_1 Conduct$
 $Expectations = b_1 Performance$
 $Expectations = b_1 Structure + b_2 Conduct + b_3 Performance$

Before these relationships were tested, it was first tested whether the variables included in the analysis had significantly different means of central tendency. Only for buyer power and sales per delivery it was the case that there was a significant difference between poles and timber traders.

With regard to the first general equation **1)**, it was found that buyer power and competition have a significant negative effect on sales per delivery. It was also found that there is an interaction effect and that the relationship between buyer power and sales per delivery is different for poles traders compared to timber traders. It was found that timber traders sell more products on an average delivery to buyers with more buyer power, while poles traders sell fewer products on an average delivery to buyers with higher buyer power. When the regressions were run separately, the effect was only significant for timber traders, meaning that there is no correlation between buyer power and sales per delivery for poles traders. This could be due to the fact that sales per delivery are not that flexible for poles traders because they cannot choose their truck size, however the found result can also be a type II error due to the fact the sample was quite small ($n=14$). With regard to the other conduct variables, a positive link was found between supply concentration and supply linkages. However this was not robust to the inclusion of the control variables. There was also a negative link between buyer power and individual price influence.

With regard to general equation **2)** it was found that there exists a complex relationship between buyer power, competition, sales per delivery and profit, where the relationship between competition, sales and profit was more important to the timber traders and the relationship between buyer power, sales and profit more important for the poles traders. When looking at the effects of structure and conduct on the threshold difference of a trader, it was found that traders with higher supply linkages and little individual price influence have lower threshold differences, and thus

generally have to accept lower prices. When explaining the Subjective Well-Being of the traders, it was found that poles traders with higher supply concentration had a higher score on Subjective Well-Being. Timber traders had a higher score on Subjective Well-Being when they have higher sales per delivery. These findings were also robust when profit was inserted as control variable in the model.

When looking at these results, the logic of the SCP framework that structure affects conduct and conduct affects performance can be corroborated by these results. The conduct is affected by the structure and the performance is mainly affected by the conduct. Only for profit the relationship is more complex, since the structure seems to have a separate effect on profit, outside the effect it has through conduct.

There were almost no results on general equation **3**) when the SCP pillars are tested for separate effects. There is only a significant positive relationship between horizontal linkages and sales expectations. This could mean the SCP framework of the traders does not affect their expectations for their profits, sales and future, or the results are biased and there are some type II errors. However, when the SCP pillars are all three included in the model, there are some significant results for effects on profit expectations. When controlled for the other variables there are positive effects on profit expectations when a trader has a more established business with higher profit and more cooperation. Higher levels of competition and buyer power, an increase in sales or more individual price influence will increase profit expectations. Overall the expectations are skewed towards the positive site, indicating a more general trend of positive expectations about the near future of wood trade. This might also be the reason so little individual relationships between the SCP pillars and the expectations were found.

7. DISCUSSION AND CONCLUSION

7.1 DISCUSSION

Although there are some interesting results in the quantitative analysis, there also are some limitations to the research. Some of the major issues will be discussed here before discussing the results of the previous chapter.

7.1.1 The objective

The objective of this research was twofold: fill the knowledge gap with respect to the market situation of small scale timber traders and try to find and explain links between the market structure, conduct, performance and the traders' expectations. The research question to be answered was *To what extend are the relationships between SCP framework characteristics different between traders and how does this affect their expectations about their future livelihood?* However, at the start of the research the objective was slightly different. As discussed in chapter 1 there are some significant changes coming in the supply sources for wood; a shift in supply from the government plantations toward the private plantations. The initial objective was to see if this shift in supply sources affected the expectations of the traders, as well as describing their market situation. However, during the interviews it was found that almost none of the traders had any idea of these changes and it could therefore not be linked to their expectations. Also, the supply changes are mainly taking place in the government plantations and large private plantations. The main source of most of the traders is the woodlots, and thus it is not surprising none of the traders are concerned about this supply shift. Lastly, at the start of this research, it was expected that a trader traded wood, and there were no major differences between traders. It was only found during the fieldwork that there are large differences between poles traders and timber traders, which are basically two different markets. This meant that during and after the fieldwork the objective of the research shifted away from the supply

shock and more towards an analysis of the market(s) and the links between the different pillars of the SCP framework and the expectations of the traders. This however changed the analysis a bit, making it more descriptive than predictive.

7.1.2 Sample and sample method

Before the fieldwork started there were already some concerns about the sample size and sample method. These concerns mostly stemmed from the fact that there is no information on how many traders there are active in the Iringa region. Therefore no optimal sample size could be chosen, and a random sampling method also was not possible. This has some implications for the results of the analysis. The small sample size increases the chance of a type II error, since a small sample might just not contain enough variation to detect a relationship. However, type I errors are also possible, since the sample might be skewed relative to the population. The non-random convenience sampling used in the study has an advantage in that it is a cost-effective alternative to the random sampling that was not possible. However it limits the research in its generalizability of the results towards the whole population, since not every unit in the population had an equal chance to be included in the sample. Therefore the results of this study cannot be generalized without a careful consideration to this limitation.

7.1.3 The usefulness of the SCP framework in a development setting

The SCP framework has been used for decades in different ways. Originally it was used to find links between the profit of a firm and its structure and conduct. Since then it has been used in many ways, but mainly to explain this relationship and the collusion hypothesis for firms and markets. However, this literature usually used data gathered from annual reports and knowledge on market shares. This was possible because most of the literature reviewed well established businesses in developed or middle-income countries, of which this information usually is available in detail. The market researched here, the small-scale timber traders, usually do not have annual reports and no data on market shares, or even on how many traders there are. This made applying the SCP framework to this market tricky, since no precedent for relevant indicators was found. Therefore a lot more data was gathered than used, since it would only be clear after the interviews which data would be relevant and which data not. However, it was found that the SCP framework is useful in describing the market, and especially in a development setting, where the structure and conduct of firms and markets is unknown and might differ very much to what has been known from the literature up to now.

The extensions of using the value chain approach as in Figueirêdo Junior et. al. (2014), the expectations as in Panagiotou (2006) and including the Subjective Well-Being as a performance indicator proved well in adapting this framework to a development setting. Especially the Subjective Well-Being is an important indicator to be included when analyzing the performance of a market in a development setting, since need theory (and other literature) stipulates that the effect of economic status and income on Subjective Well-Being are higher in samples whose income level are lower, as is often the case in developing countries (Easterlin 2001).

The SCP framework was very useful as a framework to start the qualitative analysis, since it gave direction to the shape of the questionnaire and the information that should be gathered. From this data a lot has been learned about the market for small scale wood traders and this was a great stepping stone towards the qualitative analysis. As mentioned, since there was no precedent on how to measure the variables or use them in the quantitative analysis, the used variables and techniques are rudimentary. But they lead to some interesting results nonetheless.

7.1.4 Results

In the SCP literature, there were two hypotheses about the links of structure with conduct and performance. The collusion hypothesis, in this research, expected a negative link between the level of competition and profits, as well as a positive link between horizontal cooperation and profits. No links between horizontal cooperation and profit was found. But there was a link between competition and profits. A complex relationship between buyer power, competition, sales and profits was found in which the profit of a trader was lower when faced with higher competition, but this effect diminishes with higher levels of sales. There is thus a negative link between competition and profits, as stated in the collusion hypothesis, but this link diminishes when a trader has a higher volume of sales. Also there is no indication of traders cooperating more when facing higher competition, and there is thus no proof for this part of the collusion hypothesis based on this sample.

There were some hypotheses about the effect of buyer power on conduct and performance. The literature stipulated that when a firm would face higher buyer power it would innovate more and generate more output. This was found to be true, but only for the timber traders. There was no significant effect of buyer power on sales per delivery for poles traders. However, this result does not prove that innovation lead to the higher sales, only that timber traders who are faced with higher buyer power traded more products on an average delivery than timber traders faced with lower levels of buyer power. A second hypothesis about buyer power is that it would decrease competition and increase cooperation. No significant links between buyer power and horizontal or vertical linkages were found and, from the qualitative analysis, it seems that the group of traders faced with higher buyer power, the poles traders, actually viewed they faced more competition than the timber traders who faced less buyer power on average. Lastly, the literature indicated that buyer power would negatively affect the individual price influence of a trader, a result that was corroborated by the quantitative analysis.

With respect to the Subjective Well-Being and the Expectations the hypotheses were less straightforward and the results somewhat different than expected from these hypotheses. The Subjective Well-Being of the traders was influenced by the sales per delivery for timber traders and the supply concentration for poles traders. Previous literature focused on income as a big determinant of Subjective Well-Being, however, when profit was added to the model the relationships between sales or supply concentration and Subjective Well-Being stayed the same. This indicates that it might be that Subjective Well-Being is less affected by income per se, but the means of getting that income (e.g. the structure and conduct) and including it in the performance part of the SCP framework is a good way of measuring this.

The only hypothesis from the literature for the expectations was that it would be influenced by the level of competition a trader faced, a relationship that was found, amongst others, only for the profit expectations when all SCP variables were included in the model. However, from this model it seemed that traders with well established businesses (high sales, high profits and high levels of cooperation) had less positive expectations than traders with less established businesses and no individual price influence. One reason for this finding could be that traders who are struggling more with their business have more to improve upon and therefore their expectations about the future are more positive than for traders who already operate at a good level of their business.

7.2 CONCLUSION

This research found that there are two types of traders active in the wood market in Tanzania: the timber traders who sell wood for planks or make the planks themselves and sell them and the poles traders who sell whole trees so the industry can turn them into poles. Both types of traders use the same inputs, mainly woodlots. Their structure differs downstream the value chain, with poles traders selling mainly to a few large industries and timber traders having a more diverse client base, but they

do not sell to the large industries. This means that the traders face different levels of buyer power from their clients, with poles traders facing high buyer power and timber traders facing low buyer power. In the conduct and performance some differences were found as well, mainly in the variance of the number of sales (conduct) and the profits, costs and revenues (performance). The traders did not seem to differ much in their subjective well-being and their expectations, which might be influenced by a general trend of positive expectations about the wood market in Tanzania.

Some links between the structure, conduct, performance and expectations were found, although these links have to be reviewed with careful consideration due to the small, non-random sample this research has used. From the qualitative analysis can be concluded that buyer power, competition, sales and profit are linked in a complex manner, and there are also some other links between structure, conduct and performance variables. This did not affect the expectations much. Separate regressions were insignificant, and therefore the null hypothesis of no effect could not be dismissed. Only when all SCP variables were included in the model, there were some significant effects on profit expectations. To improve these results, future research could include more regions (or even countries) to see whether the found results are robust and whether there are differences between traders that trade in a different context. Since there is more information now on the market structure of the traders, more in-depth research can be done on the relationships between the market characteristics of different traders by using larger samples and maybe even panel data so that feedbacks can also be included.

From the results it is difficult to make a prediction about the reaction of the traders on the coming changes in supply sources. No one uses the GRL plantations as a source and only a few use SHFP wood as a supply source. Few of the traders indicated to have knowledge about the changes in the supply structure, however most traders indicated to expect woodlot supply to increase, a trend that is corroborated by reports on the wood market in Tanzania (AFF 2011, Indufor2011, TEITI 2014). Therefore no drastic changes in the structure or conduct of the traders could be expected from the changes in supply sources, because the traders are not linked to these sources and get their wood mainly from woodlots. There are some other policy implications that follow from the results from this research. First, it was found that there is no certification for or oversight on the quality of wood from the woodlots, which drastically decreases the value of the products the small-scale traders trade. There are some activities in the area to increase the quality of the woodlots, such as growers associations, but not all woodlots are a member of such an association and it is still difficult to find high quality wood to trade. Second, the wood trade is severely limited by the bad infrastructure in the region, but also outside of the region. Most traders indicated transport as one of the main difficulties they encountered whilst trading. Improvements in infrastructure will improve the possibilities for traders to trade wood and increase their livelihoods.

To conclude, the market for small-scale wood traders is pretty well-functioning, with some challenges upstream with the quality of inputs and downstream with the buyer power of some clients. Some overall challenges regarding infrastructure and credit are also visible. Woodlots seem to become a much more important source of income for the region and the traders (since they get their inputs from this source) and policy and research should consider this. Lastly, at a much more theoretical point, it was found that the SCP framework is useful in describing the complexity of a market in a developing country, however some more effort is needed into designing the preferred way of measuring the pillars structure, conduct and performance. Especially since the traditional way of measuring these pillars depended on data that is often not available in a developing context.

8. REFERENCES

- AFF (2011). *Forest Plantations and Woodlots in Tanzania*, African Forest Forum Working Paper Series, vol. 1(16)
- Bain, J. (1951). Relation of Profit Rate to Concentration: American Manufacturing, 1936-1940, *Quarterly Journal of Economics*, 65(3), pp. 293-324
- Bain, J. (1956). *Barriers to New Competition*, Harvard University Press, Cambridge, MA.
- De Winter, J. C., and Dodou, D. (2010). Five-point Likert items: t test versus Mann-Whitney-Wilcoxon, *Practical Assessment, Research & Evaluation*, 15(11), 1-12.
- Demsetz, H. (1979). Accounting for advertising as a barrier to entry, *Journal of Business*, 52, pp. 345-60
- Diener, E., Diener, M., & Diener, C. (2009). Factors predicting the subjective well-being of nations, In *Culture and well-being*, Springer Netherlands, pp. 43-70
- Dobson, P, Chu, A. and Waterson, M (1998). *The welfare consequences of the exercise of buyer power*, Office of Trading, Research Paper 16
- Easterlin, R. A. (2001). Income and happiness: Towards a unified theory, *The Economic Journal*, 111, pp. 465-484
- Evans, W. N., Froeb, N. and Werden, G. J. (1993). Endogeneity in the concentration-price relationship: causes, consequences, and cures, *Journal of Industrial Economics*, 41, 431-8
- Figueirêdo Junior, De, H.S., Meuwissen, M.P.M. and Oude Lansink, A.G.J.M. (2014). Integrating structure, conduct and performance into value chain analysis, *Journal on Chain Network Science*, 14(1), pp. 21-30
- GreenResources (2013). *Green Resources: Welcome to Green Resources*, Online at <http://www.greenresources.no/Home.aspx>
- Hay, D. and Morris, D. (1991). *Industrial Economics and Organization*, Oxford University Press, Oxford, second edition
- Howell, R. T., and Howell, C. J. (2008). The relation of economic status to subjective well-being in developing countries: A meta-analysis. *Psychological Bulletin*, 134(4), pp. 536-560
- Inderst, R., and Wey, C. (2007). Buyer power and supplier incentives, *European Economic Review*, 51(3), pp. 647-667
- Indufor (2011). *Timber Market Dynamics in Tanzania and in Key Export Markets. Private forestry and carbon trade project*, Dar es Salaam
- Lee, C. (2007), SCP, NEIO and Beyond, *Working Paper Series Vol. 2007-05*, Nottingham University Business School, University of Nottingham Malaysia Campus, March
- Lennartz, C., Haffner, M. and Oxley, M. (2012). Competition between social and market renting: a theoretical application of the structure-conduct-performance paradigm, *Journal of Housing and the Built Environment*, 27(4), pp. 453-471

Lyubomirsky, S., King, L. A., and Diener, E. (2005). The benefits of frequent positive affect. Does happiness lead to success?, *Psychological Bulletin*, 131, pp. 803–855

Marion, B. W., & Sporleder, T. L. (1976). An Evaluation of the Economic Basis for Antitrust Policy in the Food Industry, *American Journal of Agricultural Economics*, 58(5), pp. 867-873

Martin, S. (2002). *Advanced Industrial Economics*, Second Edition. Blackwell, Oxford

Mason, E. (1939). Price and Production Policies of Large-Scale Enterprise, *American Economic Review*, 29(1), pp. 61-74

New Forests Company (2017). *Welcome to the New Forests Company*, Online at <http://newforests.net/>

OECD (2013). *OECD Guidelines on Measuring Subjective Well-being*, OECD Publishing, Paris

Panagiotou, G. (2006). The impact of managerial cognitions on the structure-conduct-performance (SCP) paradigm, *Management Decision*, 44(3), pp. 423-441

Peltzman, S., (1977). The Gains and Losses from Industrial Concentration, *Journal of Law and Economics*, 20, pp. 229-263

Sao Hill Industries (2015). *Sao Hill Industries*, Online at <http://www.saohill.com/>

Scherer, F. and Ross, D. (1990). *Industrial Market Structure and Economic Performance*, Houghton Mifflin, Boston, MA, third edition

Schmalensee, R. (1989). Inter-Industry Studies of Structure and Performance. In R. Schmalensee and R. Willig, editors, *Handbook of Industrial Organization*, Amsterdam. North-Holland

Stiglitz, J., Sen, A. and Fitoussi, J.P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*, Online at www.stiglitz-sen-fitoussi.fr

TEITI (2014). *Scoping study of the Forestry Sector for the purpose of including the industry in Revenue Disclosure through the Tanzania Extractive Industries Transparency Initiative*, Green Advocates international, Inc.

Appendix 1 QUESTIONNAIRE

Questionnaire small scale traders/suppliers

1. Introduce self (independent researcher)
2. Introduce objective of research
3. Explain anonymity of results - record type of supplier, date and place of interview
4. Feedback mechanisms (report)
5. Record all responses, in note form - record quotes in "xxx"
6. Remember to take photos (ask permission)
7. Back up with records/reports where possible
8. Ask for clarification and quantification where possible
9. Record "99" for when respondent does not know, NA for when question is not applicable, "88" for when does not want to answer. Leave NO BLANKS in questionnaire.
10. For questions with a Yes or No answer (Y/N): no = 0 and yes = 1
11. Questions with more than one answer possible will be indicated by an asterisk *

Interviewer: Anne van der Kolk

Date of interview:

Place of interview:

Type of supplier:

A) General indicators

1.	Name of Supplier (if applicable)	
2.	Name of Respondent	
3.	Gender	
4.	Age (years)	
5.	Highest education	

B) SCP Framework

1. Market Structure									
1.1 Supply concentration									
1.1.1	In general, how many different sources of wood do you have?								
1.1.2	In general, from what type of sources do you get your wood?*								
	If 9, indicate which type:								
1.1.3	If different sources, what is your main source?								
	If 9, indicate which type:								
1.1.4	For each delivery, do you always get your wood from the same source(s)? (Y/N)								
1.2 Demand Concentration									
1.2.1	To how many different clients do you sell your wood?								
1.2.2	What are the clients you sell to?*								
	If 9, indicate which client:								
1.2.3	How much of your wood do you sell to SHI in comparison to the other client(s)?								
1.2.4	How trustworthy do you find SHI as a client?								
	How trustworthy do you find your other clients?								
1.2.5	1. other local companies								
1.2.6	2. Local small-scale production								
1.2.7	3. other traders								
1.2.8	4. production outside the region (e.g. Dar es Salaam)								
1.2.9	5. other:								
1.3 Number of competitors									
1.3.1	How many other suppliers of your type of wood are there in the market for the same clients?								
1.4 Product differentiation									
1.4.1	Does your wood have a certification? (Y/N)								

	If yes, what type of certification?			
1.4.2	Is your wood of the same quality as the wood from GRL?			
1.4.3	Is your wood of the same quality as the wood from other traders?			
1.4.4	Is your wood of the same quality as the wood from government plantations?			
1.5 Barriers to entry/exit				
1.5.1	How easy is it to trade wood?			
1.5.2	What are difficulties you encounter when trading wood?			
2. Conduct				
2.1 Experience				
2.1.1	How long have you traded wood? (in years)			
2.2 Product				
2.2.1	Of your last delivery, what wood species did you deliver?			
	If 9, indicate which species:			
2.2.2	Of your last delivery, what was the average log size? (in cm)			
2.2.3	Of your last delivery, was the wood treated?			
	If 9, indicate how:			
2.2.4	(By interviewer): One unit of wood is a ... log of measuring ...			
2.3 How are prices set				
2.3.1	Do you set your own prices individually? (Y/N)			
2.3.2	If no, how are prices set?			
	If 9, indicate how:			
2.4 Wood delivery				
2.4.1	How often do you deliver your wood to SHI? ⁶			
2.4.2	How often do you deliver your wood to other clients? ⁷			
2.4.3	Of your last delivery, how many logs did you deliver?			
2.4.4	How many logs do you deliver on an average delivery?			
2.5 Product diversification				
2.5.1	What types of products do you trade?			
	If 2, indicate what other products:			
2.5.2	What is your main product?			
	If 2, indicate which product:			
2.6 Income diversification				
2.6.1	Do you have any other sources of income? (Y/N)			
2.6.2	If yes, what type of income?*			
	If 9, indicate what type:			
2.6.3	Does any other member currently living in your household have a source of income? (Y/N)			
2.6.4	If yes, what type of income?*			
	If 9, indicate what type:			
2.7 Marketing				
2.7.1	Do you use marketing for your wood? (Y/N)			
2.7.2	If yes, indicate what type:*			
	If 9, indicate what type:			
2.8 Horizontal linkage				
2.8.1	Do you cooperate/work together with other traders?			
2.8.2	If yes, what type of cooperation:*			
	If 9, what type of cooperation:			
2.9 Vertical Linkage				
2.9.1	Do you cooperate/work together with your suppliers?			
2.9.2	If yes, what type of cooperation:*			
	If 9, what type of cooperation:			

⁶ If SHI is not one of the clients (in 1.2.2), fill in 1

⁷ If no other clients (in 1.2.2), fill in 1

2.9.3	Do you cooperate/work together with your clients?			
2.9.4	If yes, what type of cooperation:*			
	If 9, what type of cooperation:			
2.10 Technology/investments				
2.10.1	Do you have your own truck? (Y/N)			
2.10.2	Do you have your own plantation? (Y/N)			
2.10.3	Do you have your own processing facilities? (Y/N)			
2.10.4	Do you have your own storage facilities? (Y/N)			
3. Performance				
3.1 Revenue				
3.1.1	What was the total price you got from you client for your last delivery?			
3.1.2	What was the price per unit (2.2.5) you got from your client for your last delivery?			
3.1.3	Do you consider this a fair price? (Y/N)			
	If no, indicate why?			
3.2 Buying price⁸				
3.2.1	What was the price you paid to your supplier for the wood of your last delivery?			
3.2.2	What was the price per log you paid to your supplier for the wood of your last delivery?			
3.2.3	Do you consider this a fair price? (Y/N)			
	If no, indicate why?			
3.3 Costs				
Indicate how much costs you incurred for your last delivery for:				
3.3.1	Renting a truck (whole)		Renting a truck (per unit)	
3.3.2	Fuel costs (total)		Fuel costs (per unit)	
3.3.3	Employment (total)		Employment (per unit)	
	Employment (per worker)			
3.3.4	Advertisement (last month)		Advertisement (per delivery)	
	Advertisement (per unit)			
3.3.5	Any other costs:			
3.3.6	Total costs (per delivery)		Total costs (per unit)	
Do you consider the costs you incur fair? ⁹				
3.3.6	Renting a truck (Y/N)			
	If no, indicate why:			
3.3.7	Fuel costs (Y/N)			
	If no, indicate why:			
3.3.8	Employment costs (Y/N)			
	If no, indicate why:			
3.3.9	Advertisement (Y/N)			
	If no, indicate why:			
3.3.10	Other costs (Y/N)			
	If no, indicate why:			
3.4 Profit				
3.4.1	How much profit did you make on your last delivery?			
3.4.2	How much profit did you make per unit on your last delivery?			
3.4.3	How much profit do you make on average per delivery?			
3.4.4	Do you consider this a fair profit? (Y/N)			
	If no, indicate why?			
3.5 Value added last delivery				
3.5.1	Calculate value added: revenue – buying price – costs (per delivery)			

⁸ NA if at 1.1.2 was indicated that the wood comes from own plantation (1) or communal forest (5)

⁹ Only applicable if there were costs indicated

3.6 sales		
Indicate the total sales the last month ¹⁰		
3.6.1	Total deliveries	
3.6.2	Total units of wood	
Indicate the average amount of sales per month		
3.6.3	Total deliveries	
3.6.4	Total units of wood	
3.7 Subjective well-being		
Indicate how you feel on a scale of 1 (not at all) to 5 (completely).		
3.7.1	Overall, how satisfied are you with your life as a whole these days?	
3.7.2	Overall, to what extent do you feel the things you do in your life are worthwhile?	
3.7.3	How satisfied are you with your health?	
3.7.4	How satisfied are you with your personal relationships?	
3.7.5	How satisfied are you with how safe you feel?	
3.7.6	How satisfied are you with your future security?	
3.7.7	How satisfied are you with the quality of your local environment?	
3.7.8	How satisfied are you with the way you are able to provide a livelihood for yourself?	

C) Expectations

1. General expectations		
1.1 General timber market		
1.1.1	In general, what do you expect will happen to the demand for wood?	
1.1.2	In general, what do you expect will happen to the wood supply of wood?	
1.1.3	In general, what do you expect will happen to the costs of trading wood?	
1.1.4	In general, how would you assess the overall climate for wood traders the coming years?	
1.2 Security		
1.2.1	In your view, how secure is your trade with SHI?	
1.2.2	In your view, how secure is your trade with your other clients?	
1.2.3	In your view, how secure is your supply of wood?	
1.3 Threshold price		
1.3.1	What would be the lowest price per unit of wood (as specified in B - 2.2.5) you would accept?	
2. Specific expectations		
2.1 GRL competition		
2.1.1	How much do you know about the GRL plantations?	
2.1.2	Do you feel threatened by GRL plantations as a competitor?	
2.2 GRL supply		
2.2.1	Do you expect big changes in the sources of wood supply the coming years? (Y/N)	
	If yes, indicate what kind of changes:	
	In the coming years, what do you expect to happen:	
2.2.2	To the price you pay your suppliers for wood?	
2.2.3	To the price you get from SHI for your wood?	
2.2.4	To the price you get from other clients for your wood?	
2.2.5	To the quantity of wood you will deliver to SHI?	
2.2.6	To the quantity of wood you will deliver to other clients?	
2.2.7	To the profits you get from selling wood?	
2.2.8	Do you expect to change your income generating activities the coming years? (Y/N)	
	If yes, indicate how:	

Codes

Codes part A		
3.	Male	0
	Female	1

¹⁰ If asked in February the 'last month' refers to January, if asked in March the 'last month' refers to February

5	Not finished primary 1
	Primary 2
	Secondary 3
	Higher than secondary 4

Codes part B					
1. Market structure					
1.1.2	Own plantation.....	1	1.2.3	0-25%	1
	Woodlot (small-scale).....	2		26-50%.....	2
	Private plantation (commercial)	3		more than 50%.....	3
	Government plantation	4	1.2.4 – 1.2.8	Very untrustworthy	1
	Communal forest.....	5		Somewhat untrustworthy	2
	Other trader	6		Neutral	3
	Other	9		Somewhat trustworthy	4
1.1.3	Own plantation	1	1.4.2-1.4.4	Very trustworthy	5
	Woodlot (small-scale)	2		Yes	1
	Private plantation (commercial)	3		No, my quality is higher	2
	Government plantation.....	4	1.5.1	No, my quality is lower	3
	Communal forest	5		Very difficult	1
	Other trader	6		Difficult	2
	I don't have a main source.....	7		Neutral	3
Other	9	Easy	4		
1.2.2	SHI	1		Very easy	5
	Other local companies	2			
	Local small-scale production.....	3			
	Other traders	4			
	Production in Dar es Salaam.....	5			
	Other	9			
2. Conduct					
2.2.1	Pine	1	2.6.2 & 2.6.4	Permanent wage employment	1
	Eucalyptus.....	2		Casual wage employment	2
	Teak	3		Farm income	3
	Other	9		Non-farm business income	4
2.2.3	Not treated	1		Migrant remittances	5
	Dried	2		Savings/investments	6
	Treated with chemicals	3		Other.....	9
	Other	9	2.7.2	Mouth to mouth	1
2.3.2	By government	1		Pamphlets	2
	By clients	2		Advertisements in (local)	
	In cooperation with other			newspaper	3
	traders	3		Mobile media advertisements	4
Other.....	9	Other	9		
2.4.1-2.4.2	Never	1	2.8.1 & 2.9.1 & 2.9.3	Never	1
	Sometimes (less than once a			Sometimes	2
	month)	2		Regularly	3
	Regularly (1-2 a month)	3		Often	4
	Often (1-2 a week)	4		Always.....	5
Very often (3 times a week-					
daily)	5				
2.5.1	Only wood	1	2.8.2 & 2.9.2 & 2.9.4	Delivery times	1
	Also other products	2		Delivery quantity	2
2.5.2	Wood	1		Set prices	3
	Other products	2	Other	9	
3. Performance					

3.7.1	Not at all satisfied..... 1 A little unsatisfied 2 Neutral 3 Satisfied 4 Completely satisfied 5	3.7.3 – 3.7.8	Not at all satisfied..... 1 A little unsatisfied 2 Neutral 3 Satisfied 4 Completely satisfied 5
3.7.2	Scale 0 – 10 where: Not at all worthwhile 1 Not very worthwhile 2 Neutral 3 Worthwhile 4 Completely worthwhile 5		

Codes part C			
1.1.1-1.1.5	Strong decline 1 Slight decline 2 No change 3 Slight increase 4 Strong increase 5	2.1.1	Nothing 1 Very little 2 A bit 3 Much 4 Very much 5
1.1.6	Strong deterioration 1 Slight deterioration 2 No change 3 Slight improvement 4 Strong improvement 5	2.1.2	Not at all 1 A bit 2 Neutral 3 Much 4 Very much 5
1.2.1-1.2.3	Very insecure 1 Insecure 2 Neutral 3 Secure 4 Very secure 5	2.2.2 - 2.2.7	Strong decline 1 Slight decline 2 No change 3 Slight increase 4 Strong increase 5

Appendix 2 DESCRIPTIVE STATISTICS SUMMARY

Table 18: Summary statistics (part 1)

Variable	Description	Metric	Obs.	Mean (SD)	Minimum	Maximum
Sales per delivery	Number of products sold on an average delivery	Continuous	29	879,690 (1104,257)	60	3250
Average profit	Profit made on an average delivery (TZS)	Continuous	30	1.610.446 (2.058.720)	-500.000	11.000.000
Threshold difference	Difference between threshold price and actual price (%)	Ratio	25	-17,063 (59,910)	-271,43	26,93
Subjective well-being	Average out of subjective well-being scores of 8 questions	Range 1-5	30	3,575 (0,613)	2.375	5
Profit expectations	Expectations about future profits	Likert scale 1-5	30	4,133 (0,819)	3	5
Sales expectations	Expectations about future sales	Likert scale 1-5	30	4,167 (0,913)	2	5

Table 19: Summary statistics (part 2)

Variable	Description	Metric	Categories	Obs.	Frequency (%)	Mean (SD)
Buyer power	Buyer power of the client(s) based on the type of client and number of clients.	Ordinal	1 = low power 2 = medium power 3 = high power	10 9 11	33.33 30.00 36.67	2.433 (.626)
Supply concentration	Indicates whether the supply of the trader is concentrated or not.	Binary	1 = low concentration 2 = high concentration	25 5	83.33 16.67	-
Competition	Indicates whether the trader faces much competition or not	Binary	1 = low competition 2 = high competition	9 20	31.03 68.97	-
Income diversification	Degree of income diversification indicated by the trader	Ordinal	1 = low diversification 2 = medium diversification 3 = high diversification	2 17 11	6.67 56.67 36.67	2.300 (.596)
Vertical linkages	Horizontal linkages	Ordinal	1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	6 9 11 0 4	20.00 30.00 36.67 0.00 13.33	2.657 (1.223)
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	12 5 8 1 3	41.38 17.24 27.59 3.45 10.34	
	supply	Ordinal	1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	19 6 1 1 3	63.33 20.00 3.33 3.33 10.00	1.767 (1.305)
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	15 15	50.00 50.00	
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
	clients	Ordinal	1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	2.033 (.850)
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
			1 = never 2 = sometimes 3 = regularly 4 = often 5 = always	2 13 15	6.67 43.33 50.00	
Set prices individually	Whether the trader could influence the way the price was set or not	Binary	0 = no 1 = yes	24 6	80.00 20.00	-
Future income	Expectations about the future of the wood trading activities of the trader	Ordinal	1 = stop trading 2 = no change 3 = Increase trade	2 13 15	6.67 43.33 50.00	2.033 (.850)
Type of trader	Whether the trader trades poles or timber	Binary	0 = poles trader 1 = timber trader	15 15	50.00 50.00	-