

Market Power of Middlemen

The Case of Quinoa in Bolivia

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Abstract:

The role of middlemen has been much debated throughout the years. Some claim them to be greedy exploiters of poor producers while others view them as facilitators of trade. One key component for whether they have the ability to exploit producers is the market power they possess. This thesis studies the competition among middlemen in Bolivia in order to determine what market power they have. Additionally, the effects of distance are studied to determine whether middlemen operating further away from a marketplace have stronger market power. This is done through analysis of qualitative data based on interviews on location in Bolivia with both producers and middlemen. Producers located near the marketplace sell directly to it while those located further out are dependent on middlemen. The market power of middlemen operating at the more remote distances is however determined by the competition at the marketplace. Due to specific characteristics of quinoa as well as a large increase in external demand competition among middlemen is very high throughout Bolivia.

Keywords: Middlemen, market power, competition, distance, quinoa

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Abbreviations

ANAPQUI – Asociación Nacional de Productores de Quinoa

APQUISA – Asociación De Productores De Quinoa, Salinas

ASPASA – Asociación De Productores Agropecuarios San Antonio

CECAOT – Central de Cooperativas Agropecuarias Operación Tierra

CEDEINKU – Centro de Desarrollo Integrado K'uichi

FAO – Food and Agriculture Organization

FAUTAPO – Fundación Apoyo a las Universidades de Tarija y Potosí

PRO-RURAL – Asociación Boliviana para el Desarrollo Rural

1. Introduction

“Me encantan!” (I love them), was the answer from one consultant with much experience from working with the rural poor of Bolivia upon being asked his opinion of middlemen. While he recognized that there are some issues with middlemen he nonetheless believed their profits to be small and their services to be more important than the risk for exploitation of producers. Not everyone in Bolivia share this positive view. Another consultant, working with capacity building in the far south of Bolivia, called middlemen “a mafia and necessary evil” that, if possible, should be eliminated in favor of direct links between producers and markets. Not surprisingly, this is a view shared by many producers as well. The Chief Executive of PRO-RURAL nuanced the picture by saying that middlemen have an important role to play in a complicated marketing chain as producers are too small and lack sufficient volumes to market their own quinoa. Obviously the picture of middlemen is far from clear-cut.

Middlemen have a bad reputation all around the world and especially so in the marketing of agricultural products in developing countries. Mainly by using their assumed monopsonistic position and the low bargaining power of producers middlemen are thought to take advantage of producers by offering them prices far below the market value (Pokhrel & Thapa, 2007). This has on a regular basis led to calls from policymakers, NGOs and producers for the elimination of the middleman as he is thought to be exploiting the poor producers through his behavior.

Several studies have over the years, however, found that the marketing margins of middlemen are fair and not excessive once costs and alternative investments are taken into account. One recent example is a study of Nepalese marketing of mandarins by Pokhrel and Thapa (2007) which failed to find any support for middlemen exploiting producers. This has also been the conclusion of several geographically diverse studies of agricultural markets (Scott, 1985; Enete, 2009; Hayami et al., 1999). In a report on Bolivian potato farming Jones (1984) instead found that the role of middlemen had an overall positive impact on producers and should be taken into consideration when policy for rural development was made. If middlemen are indeed not exploiting producers they can be argued to provide valuable services such as transportation of goods and market access that other actors are either unable or unwilling to provide.

At the same time there are studies with conflicting results. Mérel, Sexton and Suzuki (2009) list a number of studies that have found agricultural markets in developing countries to suffer from buying firms with much bargaining power, collusion among traders and a lack of markets for producers. Pokhrel and Thapa (2007) also refer to several studies that describe how middlemen cheat producers through monopolistic behavior and by using information asymmetries regarding prices to their advantage etc. Middleman monopsony power is suggested to come partly from the better access to credit and information regarding prices and partly due to the distances, and thus transportation costs, faced by many small producers (Flores et al. 1980, quoted in Scott, 1985). As noted by Osborne (2005) imperfect competition among traders in Ethiopia led to excessive profit margins for traders and lower prices paid to the producers.

It is thus difficult to generalize on the role of middlemen; evidence in some instances points to them providing valuable services for rural communities without exploiting the producers whereas they in other instances do take advantage of their position. Granted, variations exist among the producers

and markets that might help explain the different results from various studies. Fafchamps and Vargas Hill (2005) found that producers facing great distances to the market and who only supply small volumes of produce were more likely to sell their crops at the farmgates to middlemen than directly at the market due to the high transportation costs involved. Being located further away from the market could also reduce the availability of information regarding market prices which would increase the risk of monopsonistic middlemen taking advantage of the producers. However, if competition exists among the middlemen their market power would be reduced as producers would have more possibilities of selling their crops and consequently reducing the risk of them being exploited (Pokhrel & Thapa, 2007).

Using the Bolivian quinoa market as a case study this thesis will try to answer what the market power of middlemen trading in quinoa is like and how this changes with distances. Is there less competition among middlemen the further away from the market you get? And does this provide a possible foundation for increased exploitation of the producers?

1.1 Introduction to Bolivia

Bolivia is one of the poorest countries in South America and the people living in the area called the *Altiplano* (a highland plateau with altitudes around 4000 meters above sea level. constituting the western part of Bolivia) are thought to be the poorest in the country (Deveaux et al., 2007). While the production of *quinoa* (a type of grain, similar to rice) constitutes only a minor part of the total agricultural production in Bolivia it is very important for the poor communities living on the Altiplano as it is one of few crops that can be grown in the dry and barren environment of the Altiplano. More than 60% of the population on the southern Altiplano make their living out of agricultural production and another 25% are indirectly involved. It is estimated that some 80% of the 70 000 farm units in Bolivia that produce quinoa are small scale producers with very limited economical resources and consume a majority of the production (Rojas et al., 2004). According to Crespo et al. (2001) 15 000 of all quinoa producers regularly contribute quinoa for sale in addition to amounts produced for on-farm consumption but only 2000 produce quinoa mainly for sale and not consumption.

Most of the latter are found on the southern Altiplano where quinoa is the primary crop for producers as opposed to in the northern part. It is further estimated that up to 85% of the income of producers on the southern Altiplano derives from the production of quinoa, making it very important to them given the high dependence on farming (Collao, 2001). Due to the distances and under-developed infrastructure on the Altiplano quinoa transportation costs are almost twice as high as for other parts of the country, and with many roads being impassable in the rainy season this has a negative effect on the prices received by producers (Crespo et al., 2001). Bolivia is currently the world's largest producer of quinoa and the Bolivian government has also recognized it as an important crop for the development of the country (Tapia, 2010). With increasing popularity, in Bolivia and in the world, the demand for quinoa in the coming five years is expected to surpass the supply, which will only increase the importance of the crop for the Bolivian producers (Soraides, 2008).

Figure 1: Map of Bolivia ¹



Due to the dispersed nature of the production of quinoa, and the distances faced by many producers, middlemen are recognized to play an important role in the stockpiling and transportation of the grain (Rojas et al., 2004). While producer associations exist, ANAPQUI and CECAOT being the largest with some 3000 producers associated with them, there is still a large number of independent producers on the southern Altiplano (Collao, 2001).

1.2 Quinoa

Quinoa is a grain primarily found in the highlands of South America, especially Bolivia and Peru. The grain come in various sizes and colors depending on quality and type, see appendix 3 for illustration, and can be used in a variety of foods. One of the most common uses is boiled quinoa which has a mild taste and a firm texture, similar to rice, but it can also be found in desserts, beer, cereals and baked goods with ground quinoa powder for example (Collao, 2001). The standard unit of measurement for quinoa is the quintal. A quintal is the equivalent of 100 units of measurement and can thus mean either 100kgs or 100lbs. The measure used in Bolivia is the latter with the standard unit for quinoa on sale being one bag with a weight of 100lbs, or 46kgs³. Quintal is abbreviated as qq.

¹ Bolivia. Map. Encyclopædia Britannica Online. Web. 23 Jan. 2011.

<<http://www.britannica.com/EBchecked/media/62256/>>.

² "Bolivia." Encyclopædia Britannica. Encyclopædia Britannica Online. Encyclopædia Britannica, 2011. Web. 23 Jan. 2011. <<http://www.britannica.com/EBchecked/topic/72106/Bolivia>>.

³"quintal noun" *The Oxford Dictionary of English* (revised edition). Ed. Catherine Soanes and Angus Stevenson. Oxford University Press, 2005. *Oxford Reference Online*. Oxford University Press. Stockholm School of Economics. 1 December 2010 <<http://www.oxfordreference.com.ez.hhs.se/views/ENTRY.html?subview=Main&entry=t140.e63386>>

While all quinoa grown on the southern Altiplano belong to the same type of quinoa, *Quinoa Real*, a distinction is sometimes made by buyers between different classes depending on the size of the grain and the purity of the quinoa. Most quinoa sold through middlemen is, however, of the highest grade (Ofstehage, 2010).

1.3 Commercialization of quinoa

A majority of *conventional* (i.e. not organic) quinoa is sold at the weekly market in Challapata, located in the middle of the southern Altiplano (Soraidés, 2008). Organic quinoa, on the other hand, is almost exclusively sold through the producer associations such as ANAPQUI or directly to exporting companies. Soriano et al. (2006) in their study of the commercialization of quinoa identified several different channels available to producers. Options range from small scale rural assemblers who act in local communities to professional middlemen that process several truck loads per week to individual producers selling directly at a market place. Other forms of commercialization include truckers who simply bring the quinoa of groups of producers to the market as well as itinerant traders not primarily involved in the quinoa trade (Ofstehage, 2010).

1.4 Motivation of study area

The choice of Bolivia and quinoa as a case study of the market power of middlemen and how this changes with distance is based on several factors.

A first criterion for this kind of study is that middlemen play a significant role in the marketing of the crop. The small scale production of quinoa in combination with limited economic resources provides a possibly lucrative market for middlemen as the producers should have less opportunities to market their crops themselves due to a lack of volume and/or means of transportation. This would thus indicate that middlemen play an important role in marketing and are not simply acting as supplements to other channels. The composition of quinoa producers is also very similar to that of previous studies on middlemen and their behavior with, among other factors, many small scale producers acting independently. Quinoa is also set to play an important role in the development of the area which makes the results interesting for future policy and studies. The importance of the crop should additionally make it easier to gather data as there is a large pool of producers to choose from when gathering information. Finally, the prevalence of underdeveloped infrastructure provides a suitable setting for investigating the effects of distance as this will likely have an impact on the methods chosen by producers for selling their crops.

While Bolivia as a country is rather large the relevant area is on the contrary quite small. As described above, the production, trading and commercialization of conventional quinoa is mainly focused on the southern area and is specifically centered on the town of Challapata. This provides a clear hub from which distances and trading patterns can be researched which is preferred over a market where several centers of commercialization exists. With only one center through which a majority of the crop passes it becomes easier to isolate the role of distance in the marketing as there are no competing centers to discount for. Furthermore, the existence of various marketing channels, such as direct selling, middlemen and producer organizations provides a competitive landscape with a wide range of actors. Another basic criterion for this kind of study is the prevalence of competition in the studied market which is why a large number of competing ways for commercialization increases the likelihood of different levels of competition throughout the area. As these actors are also primarily

found in one area and not spread out over the whole country which will further facilitate interviews and data gathering.

1.5 Research question and limitations

This thesis seeks to increase the empirical knowledge of the interaction between producers of agricultural products and the middlemen who buy these products. The most frequent critique of middlemen is their abuse of market power which leads to exploitation of producers through an unfair distribution of economic surpluses. With a starting point in some theoretical models this study will perform a case study of the Bolivian quinoa market in order to answer the following question:

What market power do middlemen hold, in the case of Bolivian quinoa, and how does it change with distance?

Market power is here primarily taken to mean to what extent middlemen have the ability to set prices according to their own preference as opposed to being determined by the market. Specifically, the market power of middlemen will be measured by comparing the competition among middlemen as the existence of competition is perhaps the clearest indicator of the prevailing market power.

Studying the market power at the various distances will also help to understand what the market power of middlemen in Bolivia is as a whole through a bottom-up approach. This thesis will thus be centered around the following set of sub-questions:

- What is the overall market power of middlemen in Bolivia?
- What is the competition like at the central marketplace?
- What is the competition like near the marketplace?
- What is the competition like at a medium distance from the marketplace?
- What is the competition like at a long distance from the marketplace?

2. Methodology

This study is based on data gathered from three different quinoa growing locations in Bolivia and follows an inductive approach where the observed activities of middlemen and producers are analyzed with the aid of the theoretical framework presented.

2.1 Research method

Given the lack of quantitative data available for Bolivia in general, and the quinoa market in particular, this thesis is mainly founded on qualitative data obtained through interviews and surveys with relevant sources. Where ever possible, quantitative data have been obtained but given available resources and time for the thesis, as well as the scope, this is rather brief in nature and only serves to paint a broader picture. Qualitative information was gathered on location in Bolivia during eight weeks in October and November of 2010. Primary data from these interviews are complemented by secondary data from previously published reports and studies, mostly from local organizations and NGOs. A thorough literature review of the workings of middlemen in other markets was carried out before departure in order to gain familiarity with the subject.

2.2 Primary data/interviews

Initial interviews were held with representatives of organizations that have a comprehensive knowledge of the situation in the Bolivian Altiplano and the farming communities there to provide a general background. For the macro-perspective of agricultural production in Bolivia, PRO-RURAL, a local organization working for the development of rural Bolivia through financing of local mid-sized businesses, was approached. This organization was also the commissioner of one of the most recent reports on the quinoa market. In its role as financier for mid-sized businesses it provided information on the current marketing process of quinoa but also on the business climate for the export businesses which all tend to be of larger size. Another useful resource was FAUTAPO, an organization present in large parts of Bolivia doing development work mainly through education. One of their most recent programs is focused on increasing the production and productivity of quinoa. This organization provided access to local sources and information about the micro-level situation of the quinoa market. To complement this, ANAPQUI, the largest producer organization for quinoa growers was approached to provide details on the situation for small-scale and individual producers. It has been shown that the presence of producer organizations usually has an impact on the competition among other middlemen in a market and it will thus be interesting to see what role they play in the Bolivian quinoa marketing. While other producer organizations exist in Bolivia, due to its size and importance ANAPQUI is taken to be representative of all of them. Furthermore, the director of the private consultancy Desarrollo Económico Rural, who is the author of a recent report investigating the marketing practices of quinoa in Bolivia, was hence able to provide valuable details on this topic.

Most primary data were however gathered from the producers of quinoa, the sellers, and the middlemen buying it. In total, 20 producers of quinoa were interviewed in their respective villages as well as 10 producers who visited the central marketplace. Using data from both buyers and sellers allows for triangulation of the obtained data, comparing answers from both sides to construct a more holistic picture of the competition in the market for middlemen. Due to the itinerant nature of rural buyers of quinoa the majority of interviews with buyers were conducted in Challapata, the main market for the quinoa trade in Bolivia. A total of 25 buyers were interviewed. While not all buyers operate out of this marketplace a reasonable number of them do and the objective was to gain an understanding of the purchasing behavior of buyers as well as their perception of competition in the market. As there might however be a risk of bias in the answers of the middlemen, due to their potentially non-competitive behavior, the emphasis was put on the data gathered through interviews with the producers of quinoa.

For the initial and general interviews, open ended questions were used so as not to lead the interviewees too much while giving the interviews a semi-structured approach. Interviews at the market in Challapata as well as in the villages followed a structured interview guide to provide cross-examination possibilities and coherent answers from different locations. While the aim has not been to obtain a statistically significant number of responses, a handful of respondents in each location should provide sufficient data to draw conclusions on purchasing behavior and competition among middlemen. The main focus of these questions was on the number of buyers available at each location, alternative selling channels, ease of doing business and perceived competition/bargaining power among buyers from the sellers' perspective. (For the complete interview guide, see appendix 2.) Respondents were chosen at random to avoid biases in the collected data and to provide a representative sample of producers. As it can be hypothesized that larger producers, as measured by

their landholdings, are more likely to have their own means of transportation or established relationships with buyers the respondents of the survey include producers of varying sizes for each location.

2.3 Selection of locations

In a study of transportation costs and crop choices in Kenya, Omamu (1998) divided his sample into three categories, one at a short distance from the market, one at a medium distance and one at a long distance from the market as measured in distance. This study follows a similar approach with respondents in three different locations, using Challapata as the geographical center since a majority of the quinoa sold through middlemen pass through there. The selection of locations is made through a combination of distance measures and characteristics of the local communities. Using data from a comprehensive report on the situation among quinoa growers on the southern Altiplano (FAUTAPO, 2009) eleven quinoa producing regions were identified and graphically plotted onto the map presented on page 13. Using the plotted map each location was assigned to either of the three distance categories.

In order to attempt to isolate distance as the main difference between the locations a set of comparables were created to reduce the eleven potential locations to the desired three, (see appendix 1 for a full list of locations and variables). It is assumed that the two most important criteria for middlemen who travel around in search of quinoa is the volume available for sale in a given area and how easily this volume can be gathered.

Table 1: Selection of locations

Location	Production / producer (qq)	HA/family	Production, estimated (qq)	Proportion for sale (%)	Producers as members of associations	Quinoa producers / population
Santuario de Quillacas	36	3,30	57586	94%	21%	27%
Colcha "K"	35	2,66	81468	92%	11%	19%
San Agustín	28	2,19	12369	90%	N/A	19%

Source: FAUTAPO (2009), compiled by author

Available volume is a function of the land per family growing quinoa, total production in the area and production per producer (quintals produced per year). The ease of buying is based on the proportion of produced quinoa that is available for sale, the prevalence of competing buyers in the form of producer cooperatives and/or associations and the density of producers as a share of the whole population in the area.

While areas such as Salinas García Mendoza and Llica produce large quantities of quinoa there is also a risk that they attract more attention from middlemen due to their reputation as high-producing areas, making them outliers. This in conjunction with the relatively higher presence of producer associations such as ANAPQUI and APQUISA makes them less suitable for a comparison with other areas despite other similarities.

2.4 Potential weaknesses in the data gathered

As in other developing countries, prices and markets in Bolivia are subject to rapid change. Information can also be somewhat unreliable, including previous studies as many have lacked the

scientific stringency of published articles. In order to compensate for this and to verify the accuracy great care has been taken to cross-reference the information with that of other studies when possible. Another potential source of inconsistency is the selection of locations. These have been chosen based on the methodology described above in order to reduce the importance of other factors. It can, however, not be guaranteed that other factors than those selected, although the most likely, guide the decisions of middlemen of where to go. Factors such as existing relationships with producers in the area, quality of the quinoa or total volume available could potentially have an impact on the choices made by middlemen. It is however not the purpose of this thesis to investigate the reasons for why middlemen visit villages. The selection of locations has also been made on a municipal level while, due to time constraints, only the main village of each chosen location could be visited. This could potentially open for inconsistency between individual villages in the municipality. While the results thus cannot with certainty be said to apply to all locations no indication has been found that great differences would exist.

While the sample size from each location is not sufficient to statistically test the statements of respondents it should be adequate enough to eliminate individual opinions and/or knowledge. This can also be noticed in the, surprisingly, high consistency among answers received in all locations. As the respondents represent both small and large producers in all locations, which would arguably be the single largest source of different marketing behavior, this ought not to be a problem of any greater concern.

3. Competition among middlemen – a theoretical background

According to The Oxford Dictionary of English a middleman is “a person who buys goods from producers and sells them to retailers or consumers”⁴. The term middlemen and/or middleman will in this thesis thus refer to the actors buying quinoa from the producers for resale to either other middlemen and/or consumers. The primary focus of this thesis is on the actors closest to the producers, the ones buying at the farmgates, but middlemen acting further up the supply chain will, to some extent, also be analyzed.

Venkataraman (1971) notes that there are several hypotheses that can be set up and tested in order to determine market competition, integration and efficiency. One such hypothesis is that the larger the amount of traders competing for a market share is, the higher competition will be. The size and number of buyers thus becomes important in order to determine competition although size can, he also notes, be difficult to establish. A second, and more common method, is to study the margins prevailing between different stages of the marketing chain. If the price difference between stages of the marketing is not significantly different from the costs associated with merchandising and transporting the good it would support the hypothesis that integration is good and competition on the market is high (Venkataraman, 1971). While this thesis will utilize both methods, emphasis will be

⁴ "middleman noun" *The Oxford Dictionary of English* (revised edition). Ed. Catherine Soanes and Angus Stevenson. Oxford University Press, 2005. *Oxford Reference Online*. Oxford University Press. Stockholm School of Economics. 1 December 2010 <<http://www.oxfordreference.com.ez.hhs.se/views/ENTRY.html?subview=Main&entry=t140.e48353>>

put on the first one as such information can be more easily obtained as it should be more well-known to producers than prices and margins.

3.1 Perfect competition

While often described as a theoretical situation rarely seen in real life, perfect competition still makes a good foundation for analyzing the competition in a market. For a market to display perfect competition the following four conditions need to be fulfilled: (1) Both buyers and sellers need to be price takers. The proportion of the total output handled by each buyer and seller is so small that they have no impact on the price. (2) Products also have to be homogeneous, thus making price the main determinant for a purchase. A single market price thus exist and any deviation from this will lose all sales, or in the case of buyers, all possibility to buy. (3) Buyers need to be able to freely enter and exit markets depending on whether they can make a profit or not. (4) Full information regarding prices and quality has to be available to buyers and sellers (Pindyck & Rubinfeld, 1997).

Pindyck and Rubinfeld (1997) also note that although perfect competition usually exists in markets with many sellers/buyers it may also exist in markets with fewer actors under certain conditions. One such condition is a very elastic demand for the product, making the demand curve almost flat. Firms may also act as if there is high competition despite low numbers of actors as they may want to prevent entry of other firms, something that would drive prices towards the competitive equilibrium. Furthermore they also note that agricultural markets are one of few examples where this kind of competition has been found.

3.2 Competition and producer welfare

As mentioned in the introduction, imperfect competition among middlemen has been shown to lead to lower prices for producers as well as excessive profit margins for the middlemen in some cases (Osborne, 2005). According to Lundahl (1979) the monopsonistic or oligopolistic behavior of middlemen who control the marketing of agricultural products in developing countries is “a frequent and often powerful explanation of peasant poverty”. This monopsonistic or oligopolistic power of middlemen stems from a situation where producers face too few buyers for their crops and are thus forced to accept the price offered by the buyer, or not sell at all. In some cases this has led to the existence of so called “missing markets” where producers opt for subsistence farming instead of participation in the market (Caballero, 1982; Lopez and You, 1993).

The amount of traders in a market is an indicator of the amount of competition, with more traders leading to higher levels of competition (Venkataraman, 1971; Barrett, 1997). It is nevertheless important to keep in mind that there may still exist collusion among the traders, even if there are large numbers of them (Mérel, Sexton & Suzuki, 2009). In their study of marketing of raw cashew nuts in Mozambique, McMillan et al. (2002) demonstrate how the amount of traders affects the price pass-through to producers under imperfect competition. The following section is based on their work.

Assuming a marketing chain with three stages (for example rural assemblers, wholesalers and exporters) and the associated prices p_1 , p_2 and p_3 , the share of the border price received at the farmgate can be expressed by the following equation:

$$\frac{p_1}{p^*(1-t)} = \left(\frac{n_1\varepsilon}{1+n_1\varepsilon}\right)\left(\frac{n_2\varepsilon}{1+n_2\varepsilon}\right)\left(\frac{n_3\varepsilon}{1+n_3\varepsilon}\right)$$

With $p^*(1 - t)$ being the exogenous border price received after tax, n the amount of traders in each stage and ε the price elasticity of supply. Assuming that sellers behave competitively while buyers have monopsony power, producers in the first stage supply $Q=Q(p_1)$ and are faced with n_1 rural assemblers who decide the price p_1 . In the next step the rural assemblers face the wholesalers and the process is repeated in the same way.

This expression shows us several important things:

The costs of imperfect competition are multiplied when there are several stages that act independently of each other, what is termed the double-marginalization effect.

Also, as the number of traders increases towards infinity in each step the price pass-through increases as well, leading to $p^*(1 - t) = p_1$. Increasing competition in just one step does however not lead to significant increases in the price pass-through to producers. Even if there are thousands of rural assemblers and wholesalers but only a few exporters, producers will not receive more than a minor portion of the price. Likewise, if there is only one trader at the farmgate, producers won't receive more than 20% of the border price⁵. McMillan et al. note that the number of traders that is most important to determine producer welfare is the number of traders the producer has access to, not the total amount in the whole country.

Finally, McMillan et al. concludes that the number of traders available to producers is “intricately tied to the welfare of the farmer”. One major factor affecting the number of traders available to a particular producer is however the transportation costs faced by traders. Natural oligopsony or monopsony can be created when there are significant costs in marketing due to geographically vast markets. Studying rice producers in Madagascar, it was found that the number of producers having access to just one trader was five times as high in the areas that had poor infrastructure compared to areas with better infrastructure (Barrett, 2008).

3.3 Competition and distance

In order to better analyze the effects on competition that stems from distance Chau, Goto and Kanbur (2009) develop a model for an economy with a large number of identical producers located at a spectrum of distances, x , from a central transport hub through which all crops bound for export must pass. Transportation to the hub is done by middlemen who incur transport costs of tx . Middlemen sell each unit for the border price p^* and producers receive the price $p \leq p^*$. Any produce not bound for export can be either sold domestically or consumed by the producer at a value $0 \leq c \leq p^*$.

With perfect Bertrand competition among middlemen, where all producers know all the prices on offer, and with free entry producers receive $p^* - tx$ as long as it is higher than the reservation value c and thus producer prices only depends on their location in relation to the hub. The middlemen earn zero profit as they sell the crop at the hub for p^* and pay the producers the price $p^* - tx$ while bearing the transportation costs of tx . Under Bertrand competition there is thus perfect price pass-through to producers and distance is the only factor that decides the distribution of export surpluses among producers.

⁵ McMillan et al. use a supply elasticity of 0.25 in accordance with the World Bank medium-term scenario.

For all locations located at a distance greater than $x = (p^* - c)/t$ the border price received by middlemen is insufficient to cover the cost of transportation and producers located here will thus sell their crops domestically or consume it at value c .

Next, Chau et al. consider a more realistic situation where there is no longer perfect Bertrand competition but where buyers can take advantage of sellers' incomplete knowledge of the prices on offer⁶. Middlemen offer a price to the producer and the producer ranks the prices on offer and chooses the highest one available. Middlemen's earnings, $p^* - tx - p$, are thus dependent on the price p offered to producers and the probability of the bid being accepted as the highest in competition with other bids. For a given location with a concentration of middlemen, $\lambda_x = M_x/N$ where M_x is the number of middlemen at distance x and N the number of producers, the probability of striking a match will be higher the fewer competing offers there are. As the number of middlemen in an area increases the price offered to producers will get closer to $p^* - tx$ while the lower the number of middlemen, the closer to the reservation value c the price will get, reducing the middlemen's market power.

The market power of middlemen, λ_x , is a function of the profit they can make and the fixed cost for visiting each producer, K :

$$\lambda_x = \frac{M_x}{N} = \max \left\{ \ln \frac{p^* - tx - c}{K}, 0 \right\}$$

From this expression we can see that an increase in the border price will lead to higher competition while market power decreases with an increase in distance as this incurs higher costs for the middlemen. With free entry, $K = 0$, it can be shown that middleman market power disappears and the Bertrand outcome is reached. With entry costs being positive however, the area served by middlemen will be smaller than under Bertrand competition and will lead to some producers not being served.

Chau et al. thus show that middleman market power depends on location and that this decides the concentration, or number, of middlemen present at each location. This model predicts that the areas closest to the hub will be served exclusively by middlemen, areas outside of the profitable range of middlemen will be served by non-profits and the areas in-between will be served by a mix of the two. Producers located at more remote locations, but that are still served by middlemen, risk receiving an unequally small share of the surplus due to the stronger market power of middlemen in such locations.

⁶ See Chau, Goto and Kanbur (2009) for full evidence.

4. Empirics

The following paragraphs give a brief, general, description of the studied locations in order to put the gathered data into context. Each location was selected according to the process described in the method chapter and visited during the early planting season in October and November which is a time when producers are accessible for interviews in the villages. Throughout the thesis the central marketplace of Challapata will be referred to as “the marketplace”.

All three locations are located near the salt flats of southern Bolivia and share the same climatic conditions, mainly dry and dusty, even though there exist some variations in the types of quinoa grown. While differences in quality should be taken into account when analyzing the purchasing behavior of middlemen the main distinction made is usually whether the quinoa is conventional or organic. As most organic quinoa is sold directly to producer cooperatives or large processing companies this, however, constitutes only a minor part of the quinoa traded by local middlemen and is not directly relevant for this study.

4.1 Location and transportation

4.1.1 Santuario de Quillacas

The village of Santuario de Quillacas is located about two hours by either bus or pickup truck from the marketplace with a population of close to 2500 inhabitants (FAUTAPO, 2009). A paved road is currently under construction, reaching about halfway to the village as measured from the marketplace. This will be extended to the communities located west of Quillacas in the near future, replacing the current dirt road. Due to this position on the main road to the other communities Quillacas sees a lot of through traffic and several buses and/or trucks passes every day as well as a reasonably large amount of private vehicles willing to provide transportation. As in all the other studied areas the production of quinoa is of great importance to the local economy. Throughout the thesis this location will be referred to as the “near village”.

4.1.2 Colcha “K”

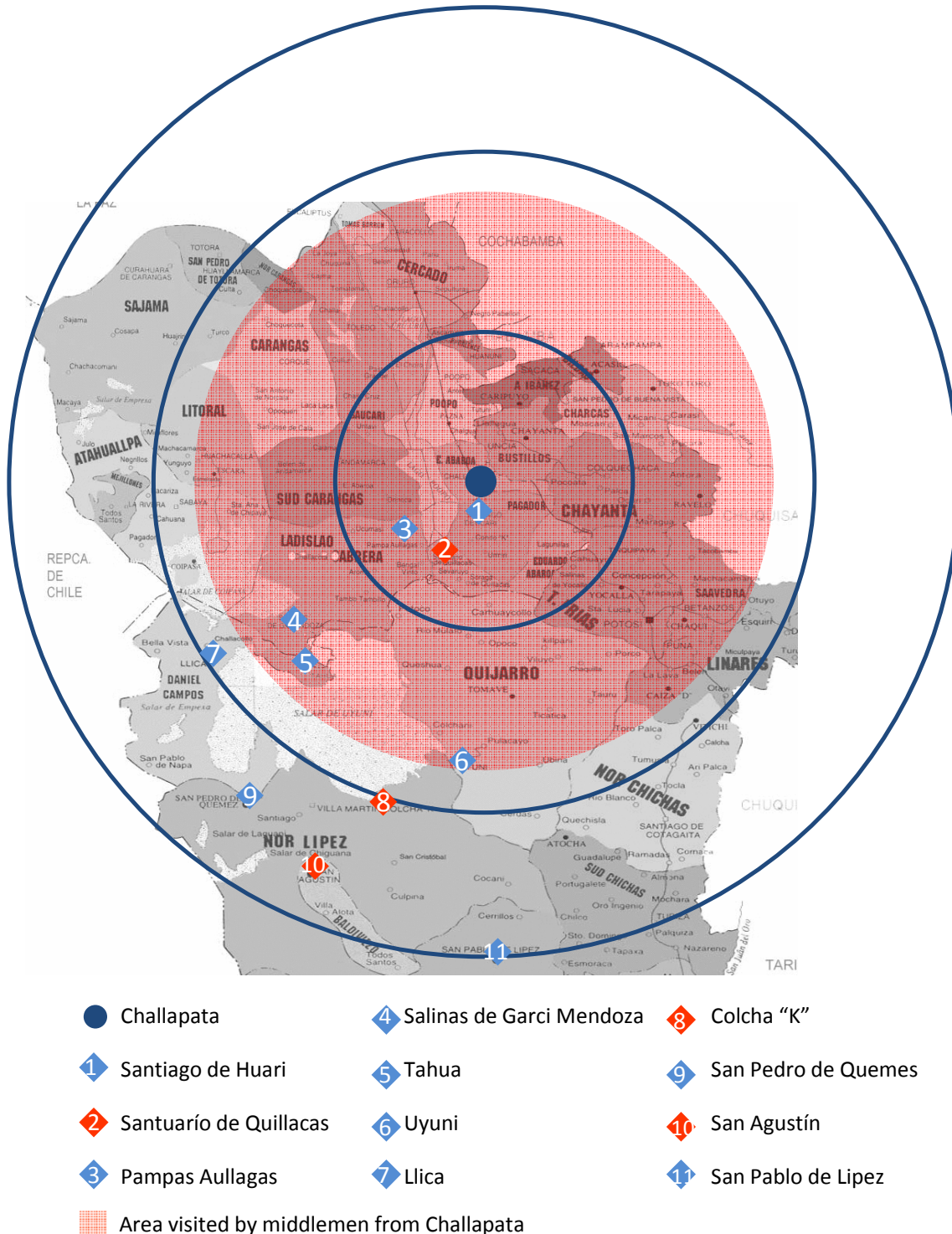
Located on the northern shores of the Uyuni salt flats, Colcha “K” is only connected to the main road heading north towards the marketplace by a rough dirt road that partially runs through the salt flat. In the dry season the journey to Uyuni, which is the nearest market place of importance, takes about two to four hours. Travel times in the wet season are substantially longer as the salt flat is then covered by water, reducing speeds. From Uyuni it is another six to seven hours to the marketplace. Buses run once a day every second day to Colcha “K” from Uyuni and private transportation is scarce with the occasional vehicle passing/leaving. The road continues to other communities but given their increasing remoteness transportation options are few although not non-existent. Colcha “K” will be referred to as the “middle village”.

4.1.3 San Agustín

At a distance of more than five hours from Uyuni, with an additional six or seven to the marketplace, San Agustín is located the furthest away of the three studied locations. In terms of transportation this is by far the most remotely located location of the three with only one bus per week reaching the village, leaving on Wednesdays and returning on Fridays. Located at the end of the road in a hilly area San Agustín sees little other traffic than that destined for the village, limiting transportation

alternatives. Occasional vehicles leave for a nearby village, one hour away, from where it is possible to find onward transportation but this is a cumbersome and time-consuming venture, especially without prior arrangements. Throughout this thesis San Agustín will be referred to as the “remote village”.

Figure 2: Graphical illustration of quinoa producing areas in southern Bolivia



4.2 Marketing of quinoa

Table 2: Data gathered from quinoa producers in southern Bolivia

Location	Ha./ prod.	Always sells to the same buyer	Aware of marketplace price	Normal place of sale	Transportation cost Bs./ quintal (mode)
Near village	10	No	Yes	Marketplace	
Near village	6	No	Yes	Marketplace	5 (truck)
Near village	2	No	Yes	Marketplace	Own truck
Near village	2	No	Yes	Marketplace	5 (truck)
Near village	1	No	Yes	Marketplace	5-10 (truck)
Near village	1	No	Yes	Marketplace	3 (bus)
Near village	1	No	Yes	Marketplace	3 (bus)
Middle village	10	No	No	Village	-
Middle village	8	No	Yes	Village	-
Middle village	8	No	No	Village	-
Middle village	5	No	Yes	Village	5 (truck)
Middle village	4	No	No	Village	-
Middle village	2	No	No	Village	-
Middle village	2	No	No	Village	-
Middle village	2	No	No	Village	-
Remote village	8	No	No	Village	-
Remote village	5	No	No	Village	-
Remote village	5	No	No	Village	-
Remote village	2	No	No	Village	Own truck
Remote village	2	No	No	Village	-

4.2.1 The near village

Irrespective of location a quinoa producer has the choice to either sell directly at the marketplace, sell through a middleman, or directly to an end consumer such as a company, producer association or individual consumer. While two of the latter might be considered middlemen as well this thesis focuses on the middlemen who are acting between these actors and the producers. The data shows that marketing practices of quinoa producers in the three locations are distinctly different.

Producers in the near village, located a short distance from the marketplace, with few exceptions bring their quinoa directly to the weekly market where they sell to small scale buyers in the street. None of the interviewed producers found it neither difficult nor expensive to sell directly at the marketplace and cited the readily available transportation options as a main contributing factor. While some producers own their own vehicles, mainly small pick-up trucks, others pay passing trucks or buses for taking their loads. At the time of research the going rate for transportation per quintal ranged from Bs. 5 to 10, or 1-2% of the price paid per quintal of quinoa at the marketplace. Small producers, selling smaller volumes, also reported utilizing public transportation and thus only paying for the passage and not a transportation fee per sack.

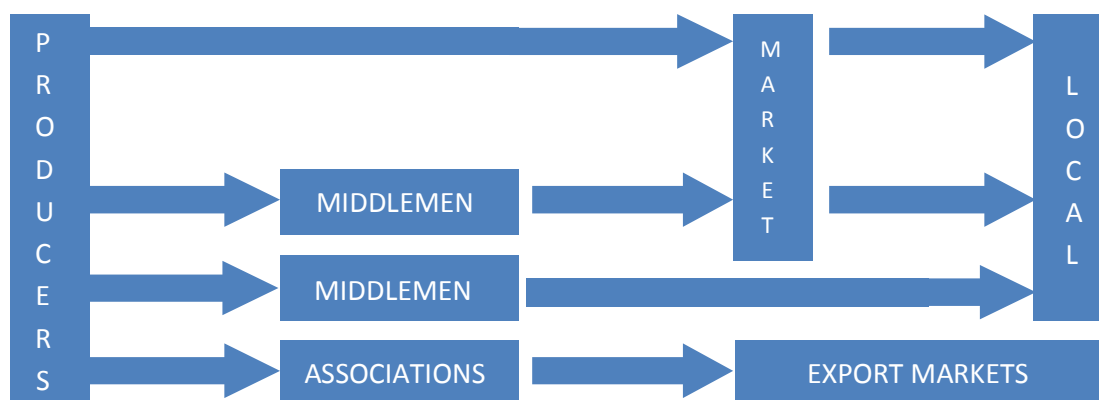
Middlemen visit the near village every few weeks, wishing to buy quinoa, and while most producers sell the majority of their crops directly at the marketplace they have no reservations against selling it to middlemen in the village. This is stated to be due to the fact that prices offered in the village are the same or just slightly lower than the ones offered at the marketplace, the difference roughly being equivalent to the transportation costs. All producers interviewed were well aware of the current prices at the marketplace and several also exhibited a good understanding of how the marketing mechanisms work. Information regarding current prices is obtained either through phone or by

talking to other producers and/or villagers who recently visited the marketplace. While several producers expressed a desire to sell directly to consumers there were no direct accusations of middlemen taking advantage of their position. Or, as one producer put it, “it is easy to sell but harder to get a good price”. Producers sell smaller quantities for necessity throughout the year in order to buy other products such as rice, sugar and foods etc. but there exists no distinguishable difference in the marketing behavior of such sales as compared to sales for commercialization.

While there is a local producer cooperative it currently only coordinates the occasional joint transportation of quinoa but does not provide any other services. The main objective of the cooperative instead is related to infrastructural projects such as irrigation systems and the building of a local processing plant for cleaning and sorting the quinoa. This is hoped to increase the prices received as this is currently done by the buyers at the marketplace and/or directly by the processing companies.

Marketing of quinoa in the near village through middlemen is highly dependent on the availability of visiting middlemen. Producers are indifferent between selling through middlemen or directly at the marketplace and will sell to the former as long as prices are corresponding to what they could receive at the marketplace.

Figure 3: Options available for producers to market quinoa



4.2.2 The middle village

While producers located near the marketplace sell their crops directly to the actors there this option is not as readily available to producers in the middle village. The predominant method of selling the crops, irrespective of size of the producer, is instead through sales at the farm gate to middlemen. These middlemen come every few weeks with a truck as part of a tour of the area, in addition to buying quinoa they also sell staple goods and other supplies. It is important to note that not all middlemen act through the marketplace but that some sell directly to companies in La Paz and Oruro for example, there are however no indications that their behavior would be any different than for other middlemen. Given the infrequency of these visits and the lack of goods for sale in the village, producers sometimes find themselves forced to visit Uyuni, the nearest town, for stocking up on supplies. While the market for quinoa is limited in Uyuni with mainly one buyer, the processing company Real Andina, producers view this as an alternative should the need be too great. As described above, transportation options exist but are significantly more expensive than in the near

village as both buses and private vehicles charge Bs. 20, or four times as much, for transportation to the nearest market.

The awareness of prices is considerably lower in the middle village as producers rarely visit the marketplace themselves and primarily receive price information from the middlemen. Cell-phone coverage is scarce and limits the possibilities for communicating with buyers at the market. Producers claim that prices paid in the village would be around Bs. 50 lower than at the market but these claims remain un-substantiated due to a lack of recent sales to compare with. Prices also tend to fluctuate more in and around the period before the planting season as stockpiles are unloaded onto the market (Soriano, 2010) further making it difficult to compare. The prices paid by middlemen are however the same as non-members receive if selling to the local cooperative, CECAOT. Membership in producer organizations such as CECAOT is, however, very low in the region, barely reaching 10% according to data from FAUTAPO (2009), but the number varies within different communities in the region.

Producers located at a medium distance thus sell the majority of their produce to middlemen directly in the village, not by visiting a market themselves. This is supported by spot-checks in nearby villages where similar behavior was identified. Interesting to note is however that producers in a village located near the main road, about one hour from the middle village in the direction of the marketplace, reported occasional selling at the marketplace.

Table 3: Share of producers in a community that are part of an association					
Santiago de Huari	Pampa Aullagas	Salinas de Garcia Mendoza	Uyuni	San Pedro de Quemes	San Pablo de Lipez
5%	10%	54%	33%	N/A	60%
Santuario de Quillacas	Tahua	Llica	Colcha "K"	San Agustín	
21%	9%	58%	11%	N/A	
Source: FAUTAPO, 2009					

4.2.3 The remote village

As can be seen from table 3 membership in an association is higher for the locations further away from the market place such as Llica and San Pablo de Lipez. This corresponds very well to the situation in the remote village where the president of CEDEINKU, the local producer association affiliated with ANAPQUI, estimates that a full 80% of the quinoa sold by local producers is sold through her organization. As with all producer cooperatives it offers a fixed price of Bs. 700 per quintal, independent of the season of the year, to their members. Non-members are, however, welcome to sell to the association as well – as long as they meet the requirements regarding quality and adhere to the norms regulating the use of pesticides.

The remaining 20% is sold to visiting middlemen but the frequency of these visits is far lower than for the locations closer to the market. Only every second month middlemen make the detour to the remote village, despite claim of the producers that the quality of their quinoa is higher than in other regions. Many of the sales to the middlemen are, however, necessity sales since the middlemen also provide one of the few channels for goods coming in to the village. While some producers bring their

quinoa to be sold in a nearby village, located near the main road to Chile, the situation there is similar to the remote village with a majority being sold to the associations. Similarly to the other locations, producers in the remote village do not find it particularly difficult to sell their quinoa, or as one producer explained: “Selling is not difficult, but getting a good price is.” While no exact numbers exist on the difference in price paid by the middlemen who visit the remote village producers believe the difference to be less than Bs. 100 per quintal. This has, however, not been verified. A local consultant working with capacity building for quinoa producers confirmed that the situation in the remote village is typical for most of the communities in southern Bolivia – most of the quinoa is sold through associations and the rest to visiting middlemen. Interesting to note is that the consultant’s image of the middleman as “a necessary evil” was not shared by the president of CEDEINKU. As noted by Ofstehage (2010) in a study of the communities in the remote village, middlemen not only act as buyers of quinoa but also as providers of banking services, news bringers and suppliers of staple goods.

These findings are supported by data from the marketplace where 85% of the street buyers report buying exclusively from producers, not from other middlemen. In addition to this they report that producers from within 4-5 hours, or up to 150-200km, away come to sell directly, which corresponds to the greatest distance most of them travel in search of quinoa. Only one of the close to 30 interviewed buyers claimed to travel to the locations furthest away from the marketplace. A spot-check of sellers at the market also provides support for this as none of the sellers came from the communities located the furthest away. Instead, they all came from within the area specified by the buyers. While several sellers reported selling most of their crop directly at the market there were also producers who normally sold through associations or to middlemen in their villages. With few exceptions the sales were made out of necessity, something that is easily explained by the time of the year, as the main harvest usually is during the months of May and June (Tapia, 2010). The volumes offered for sale ranged from two to twenty quintals, with an average of close to ten quintals per seller, something which appears high with an average production per producer of 37 quintals per year. Sellers of smaller quantities reported selling quinoa individually but several of the ones selling greater quantities were selling quinoa on behalf of relatives and/or neighbors in addition to their own quantity.

4.3 Number of middlemen

Table 4: Number of middlemen in the villages

Number of middlemen, range	2-3	4-5	6-7	>7
Producer's replies:				
Near village	0	4	1	0
Middle village	3	5	0	0
Remote village	2	2	1	0
Total	28%	61%	11%	0%
Middlemen's replies:				
Marketplace	20%	50%	10%	20%

While the reliance on middlemen for selling quinoa differs between locations, there is no significant difference in the number of buyers. Even though respondents found it difficult to specify the exact amount of buyers visiting, as this is not a static number and, among other things, depends on the

harvest available, there is a striking similarity among the numbers reported. Independent of location, there are, on average, no less than two and no more than five middlemen visiting the producers' communities looking to buy quinoa. These data are supported by the middlemen themselves who report the same numbers with few exceptions when asked to specify the number of competitors they face while buying in the villages. An adjustment of the data for an exceptional outlier⁷ renders an average of six competing middlemen per location visited by the interviewed middlemen, and a majority stating that they face approximately five competitors. Important to note is that these are the middlemen who mainly operate in the areas closest to the marketplace, at distances up to four or five hours away, and thus not in the middle or remote villages. Yet data from the middle village is in line with this finding as neither this location is visited by any more than five and no less than two middlemen, with similar results for the remote village and a neighboring village. For the annual fair held in the middle village in September the number was slightly higher with seven middlemen visiting; three from La Paz and two from Cochabamba and Tupiza respectively but no buyers from the marketplace.

One difference between the different locations, however, is the frequency of the visits of middlemen. While the near village is visited every few weeks by potential buyers this number is positively correlated with distance as the remote village is only being visited every two months or so. The number of concurrently visiting middlemen at any given time is only more than one in exceptional cases, such as after a particularly good harvest. Only one buyer interviewed indicated that there would be fewer competitors and more favorable terms for buyers in the more remote locations. The distinction made was, however, the same as described above: instead of five competitors there would only be two or three.

Middlemen on average visit 20 to 50 different communities on a typical buying tour where they travel by truck from village to village, usually spending 1-3 days in the field. Some apply minimum and maximum volumes desired for a trip as they recognize that any trip is associated with costs for transportation, accommodation and time spent, the limits usually being dependent on how much a truck can carry. All middlemen interviewed claim that the locations visited differ from time to time but many at the same time acknowledge having relationships and contacts with certain communities. Communications are mostly by cell-phone, something that effectively would exclude areas such as the middle village and the remote village as there is no or very limited coverage in those areas.

The number of middlemen has, according to all interviewed, increased in the past few years and increased competition among buyers. Higher prices of quinoa has attracted more buyers, something that can be seen especially at the marketplace where the smallest buyer claim to buy just 13 quintals per month, to be compared to the average of around 400 quintals. As noted by one middleman, a price of Bs. 500 entails substantial capital investments and limits entry into the business.

4.4 General competition

Producers and middlemen alike unanimously characterize the competition between buyers of quinoa as being very high, independent of location and size of the producer. While the number of buyers in each location appears quite low, especially taking the time between visits into consideration, any

⁷ While the question asked was "How many other middlemen do you face per location?" some respondents with higher than average answers may have interpreted the question as the total number encountered on a buying trip.

suggestion of collusion on behalf of the middlemen were fiercely disputed by them. Or, as one indignant buyer stated: “This is business”.

Whereas some bonds may exist between buyers and sellers, such as sellers calling a buyer they have done business with before, there exists no loyalty towards particular middlemen among the producers. No producer reported selling to the same buyer all the time, instead they sell to the highest bidder, sometimes turning down offers hoping for a better one to come along, storing the quinoa in the meantime (Silguer, 2010). One producer reported storing about half the harvest for necessity sales throughout the year while selling the remaining half at the time of harvest. Because of its physical properties, quinoa can be kept in storage for longer times than more perishable crops. The middlemen are clearly aware of this possibility and more than one stated that they were forced to adapt their prices to the requirements of the producers “as they will just sell to someone else otherwise”. According to Pedro Mamani, Area Responsible for Producers at FAUTAPO, this change in bargaining power among the producers was first seen two or three years ago and is linked to the increase in demand for quinoa (Mamani, 2010). While middlemen may have certain areas they frequent more often than others there is no loyalty to one area in particular, they instead visit different areas each time, mainly depending on where there is quinoa available.

While associations such as ANAPQUI require their producers to comply with strict rules for certification they nonetheless provide an alternative to middlemen for producers.

4.5 The role of producer associations

Producer associations such as CECAOT and ANAPQUI were created in the late 1970s and early 1980s to safeguard the economic and social rights of quinoa producers as well as to increase the development of the areas where these producers lived⁸. As mentioned before, the associations only work with certified, or organic, quinoa and pay their members a fixed price of Bs. 700. The largest association, ANAPQUI, operates 50 regional storage centers in 8 regions together with their regional affiliates for which they coordinate transportation to their processing plant at the marketplace. Once processed the quinoa is exported to the European and American markets (Alanoca, 2010).

Being a member of a producer organization does not prevent producers from selling part of their produce to middlemen. These sales are often necessity sales as the associations do not provide a barter system like some middlemen that use quinoa as a mean of payment for other goods. This kind of trade is however not barter in its strictest sense as the price of quinoa is converted to Bolivianos and then matched to the price of the good bought by the producer (Ofstehage, 2010). Aside from possible cooperation regarding transportation and marketing of quinoa, being part of an organization also gives a legal status which facilitates doing business with others. As in any other country, registered companies are more reluctant to do business with unregistered actors, thus, being part of an organization facilitates contracts and tax payments. It also makes the undertaking of joint projects for infrastructure such as irrigation systems and the construction of deposits for storing quinoa easier (Silguer, 2010).

Despite these benefits and the long history of producer associations far from all producers are part of them as seen in table 3. The Secretary General of ANAPQUI put forward the idea that the requirements put on producers may act as a deterrent for some that prefer to have more freedom in

⁸ <http://www.quinoa.com.bo/index.php?Vent=20s>

their production or simply are unable to meet the requirements. In order to sell organic quinoa a certification is required which adds an additional cost for the producers. Less flexible arrangements for payment, and sometimes delayed payments, further contribute to producers selling to middlemen that pay upfront instead. ANAPQUI is currently not operating at full capacity and has room for more producers, and actively encourages it, “our gates are open” as the Secretary General says, but does not view other associations as competitors. While he admits scale being a key issue for them their non-profit foundation at the same time puts less emphasis on profitability (Alanoca, 2010).

4.6 Competition at the marketplace

Table 5: Survey of middlemen at the marketplace

qq./month	Mostly sells quinoa to	% bought direct from producer	# of other middlemen at marketplace	Visits villages to buy quinoa	Furthest distance for visits
13	Wholesaler ⁹	100%	-	No	-
20	Wholesaler	100%	-	No	-
100	Wholesaler	100%	50	Yes	4-5h
150	Wholesaler	80%	-	Yes	2-3h
200	Company	100%	50-70	Yes	4-5h
200	Different	100%	-	No	-
300	Different	100%	-	No	-
300	Wholesaler	100%	-	Yes	4-5h
300	Wholesaler	100%	-	Yes	4-5h
300	Peru	100%	50-70	Yes	4-5h
400	Company	95%	-	Yes	No limit
400	Company	80%	-	Yes	7h
400	Company	100%	70	Yes	4-5h
400	Peru	100%	50	Yes	2-3h
500	Company	100%	-	No	-
500	Company	100%	-	Yes	2-3h
700	Different	100%	-	Yes	1-1,5h
1000	Company	100%	-	Yes	4-5h
2000	Company	80%	-	Yes	4-5h

What is here referred to as the marketplace is indisputably the most important trading center for quinoa on the southern Altiplano of Bolivia. Most of the quinoa traded here is of conventional kind and destined for the border market in Desaguadero for further export to Peru (Soriano et al., 2006). It is difficult to estimate the total amount of buyers as smaller actors constantly come and go, depending on financial capabilities and supply (Mamani, 2010) but the local association of quinoa buyers has some 70 members. Likewise, estimates made by the middlemen themselves range from around 50 to 70 buyers. These numbers display only a minor change from what Soriano et al. found in 2006 when they estimated there to be three large wholesalers, some 30 small to medium sized wholesalers, and around 50 to 100 small irregular buyers. Classifications on whether a buyer is a large or small wholesaler is based on volume processed per week with the former handling, on average, four to six truck loads of quinoa and the latter one or two loads (Soriano et al., 2006). On Saturdays and Sundays some 30 middlemen wait outside their shops and on the streets to the east of the main market with portable scales and thick wads of cash. The average buyer is handling 400 quintals per month but the range goes from just short of 15 to 2000 quintals. The latter is to be

⁹ Wholesaler refers to the three largest wholesalers at the marketplace.

considered a large wholesaler due to the high volume processed and also reported buying 20% of her volume from other middlemen as opposed to the others who mainly buy directly from producers.

Smaller wholesalers, especially those processing less than 300 quintals per month, primarily sell their quinoa to one of the three larger wholesalers that operate out of the marketplace and bring the quinoa to the Peruvian border in Desaguadero for informal exports. While many of the larger middlemen sell to several different buyers, including the large wholesalers and the Peruvian border market, a common buyer is one of the processing companies that will then either export or sell domestically. The only observable cooperation, or even interaction, among the middlemen in the street is the trucks that arrive around lunchtime to gather the purchased quinoa and transport it to their respective storage location.

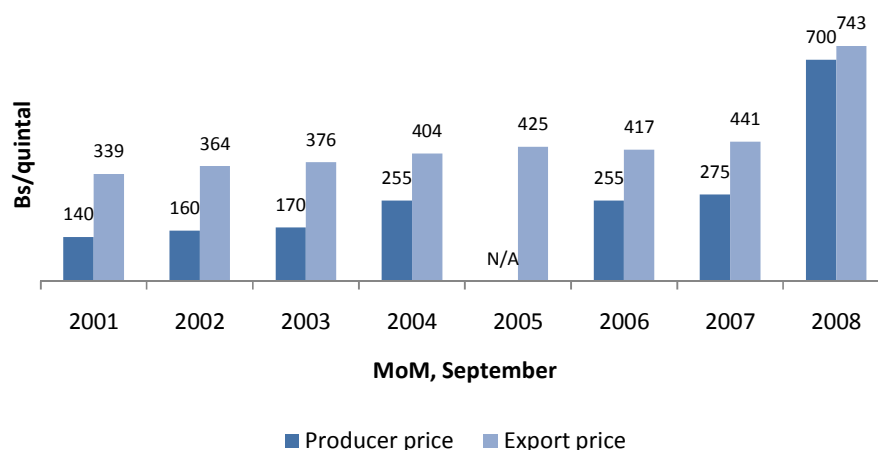
On a given day the prices offered by the buyers are virtually identical. At the time of research all buyers quoted Bs. 500 per quintal as their standard price although some acknowledged that they sometimes could make exceptions. The margins for middlemen trading in *quinoa bruta*, i.e. where no value is added to the product, are around Bs. 5-30 per quintal. If washing, sorting or other processing takes place margins rise to Bs. 50-100. While all of these middlemen wish to increase the volume purchased the prices paid to them by the buyers further upstream prevent any raises in prices paid to the producers. All producers interviewed at the market were perfectly aware of prices paid and appeared to choose buyer depending on the availability of the buyer, i.e. ease of selling.

In addition to being the main center for the quinoa trade the marketplace also provides all kinds of goods and attracts not just quinoa sellers. Weekends sees a significant increase in available transportation with minibuses, buses and private vehicles offering fares to visiting customers.

4.7 Development of prices and quantity

4.7.1 Prices

Figure 4: Price development, organic quinoa 2001-2008



Source: FAUTAPO (2009); FAO (2010); Soraidés (2008), compiled by the author

The price of organic quinoa has been increasing steadily over the past decade but a dramatic increase occurred in the year 2008. At the same time the spread between the border price and market price

decreased significantly, as can be seen by figure 4. While these prices are for organic quinoa and most middlemen trade in conventional the prices tend to correlate. In October 2010 the observed difference between prices offered to producers for organic and conventional quinoa was about 29% but this number naturally fluctuates with the changes in price for conventional quinoa. Earlier studies by Collao (2001) and Crespo (2001) identified a 20-25% premium for organic quinoa, a premium which is partly due to the higher costs associated with certifying quinoa. Some producers claimed that the price was unusually low at the time of this study indicating the difference could have been smaller in recent years. FAUTAPO (2009) for example observed a difference of 8-10% in their report for the year 2008.

While previous studies have found that the difference between the prices paid in the villages and those at the marketplace are small they have not specified whether this is true for all distances. Two popular ways to increase these margins do, however, exist. One such way is to keep the bags supplied by the producers and by doing so adding the value of the bag to the margin. Use of faulty scales in order to be able to offer a, seemingly, higher price have also been reported (Soriano, 2010; Ofstehage, 2010).

4.7.2 Production

Table 6: Statistics on production, 2000 - 2009

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Area (Ha)	36847	37223	37817	38289	38649	39302	42431	45454	46369	48136
Yield (Hg/Ha)	6455	6259	6393	6512	6387	6412	6333	5852	5859	5874
Production (TM)	23785	23299	24179	24936	24688	25201	26873	26601	27169	28276
Domestic (TM)	22349	21176	22160	22134	20942	20375	19121	16145	16970	
Export (TM)	1436	2123	2019	2802	3746	4826	7752	10456	10199	
Export Value (1000, USD)	1801	2411	2328	3085	4266	5573	8914	13107	23028	

Source: FAO (2010)

Bolivia has seen a large increase in the land harvested for quinoa, increasing with some 30% since the year 2000. Yields for the corresponding period have however gone down. A clear gain can also be seen in the volume of exports which have increased sevenfold with especially large increases since 2007. Numbers for the informal exports to Peru are hard to come by but Alcalá (2007) put the number at 25% of total production which is somewhat higher than the 17% and 10% that Soriano (2006) and Crespo (2001) respectively put it at.

5. Analysis - Market power of middlemen on the Bolivian quinoa market

While it is rare to find markets that are perfectly competitive the criteria for such a market is a useful starting point for determining what competition on a market is like. The most straightforward indicator of the degree of competition is the number of middlemen available per producer, as studied by Chau et al. as well as McMillan et al. Another way, as described by Venkataramanan, is to analyze the margins of middlemen in order to deduce what the market power in a given area is. Low margins indicate that there is high competition among buyers which in turn would mean that the market power of middlemen is low. Throughout the following chapter both methods will be utilized in order to provide as clear a picture as possible of the market power of middlemen in each of the three studied locations in Bolivia.

The three locations all display different dependence on middlemen for marketing of quinoa, much like the model of Chau et al. predict, but the observed market power of middlemen does not correspond to that predicted by the models. First, the area closest to the hub/marketplace is in the model expected to be served exclusively by middlemen, this is not the case in Bolivia. Instead producers in the nearest area sell the majority of their crop directly to the market. Second, and in line with the model, the remote village is primarily served by producer associations without an explicit profit generating purpose. Their main purpose is instead to assist the development of the local communities and enhance production of quinoa. As predicted by the model the studied area in between these other areas is primarily served by middlemen and while associations exist in this area as well the proportion of membership is lower than for the remote village. There does not appear to exist any area in southern Bolivia which is not covered by the activities of either associations or middlemen.

While the remote area is indeed served primarily by associations, middlemen still operate in the area although their role may be less significant than in the other areas. Especially sales for necessity are still done through middlemen in these areas as well which could provide middlemen with an opportunity to take advantage of potential market power. The importance of distance is analyzed by studying competition at the three separate locations. Given the importance of the marketplace this is analyzed separately.

5.1 Characteristics of quinoa

Quinoa to a large extent fulfills the requirements of the homogeneous product needed for perfect competition to potentially exist. All quinoa grown on the Altiplano belong to the same specie and middlemen mainly trade in the highest grade quality, making differences in quality of the quinoa sold negligible. The greatest distinction made is instead the one between organic and conventional quinoa. Most of the trade in organic quinoa is however not managed by middlemen but by producer associations or companies. Conventional quinoa traded by middlemen can thus be argued to be a very homogeneous product which is also supported by the uniform prices offered at the marketplace. Were there to be large differences in quality such a uniform price could reasonably not be sustained.

Quinoa is in addition to this also a highly mobile product. Due to the possibility of storing quinoa for longer periods of time without it perishing it can be transported longer distances than a more perishable product could. Quinoa can be described as a “high value, low volume” product as a

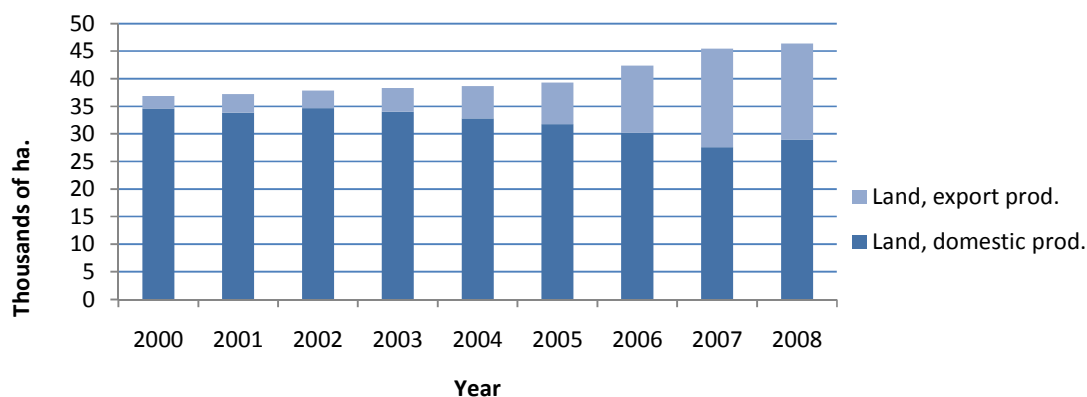
reasonably small amount, one quintal, generates a substantial income for the producer. This can for example be compared to the mandarins studied by Pokhrel and Thapa which is the opposite; a perishable product with a low value per unit of volume. An additional benefit of quinoa not being perishable is the reduced importance of both the timing and the location of the sale as the crop can be stored until prices are higher and/or volumes consolidated over time so that economies of scale more easily can be obtained. Economies of scale become very important when producers mainly are small scale farmers that individually have insufficient volumes to hire a truck and are unable to bring the crop to the market themselves. As a product, the inherent characteristics of quinoa have several advantages that potentially increase the market power of the producers and thus lower that of the middlemen trading the crop.

5.2 Overall market power

In order to better understand the market power prevailing at the different locations it is useful to start with an analysis of what the general competition for quinoa in Bolivia is like and how it has developed over the past years. According to the middlemen interviewed there has been an increase in competition in the past few years and all interviewed stakeholders agree that competition among buyers for quinoa in the southern part of Bolivia is high. This claim can be empirically substantiated by changes in prices and production of quinoa.

First, a dramatic increase in prices for quinoa can be observed over the past decade. This is especially true for the export grade, organic, quinoa but as the prices for conventional quinoa to a large extent follow that of organic the same can be assumed to hold for all kinds of quinoa. The increase in price can be explained by a boom in exports that started in 2004 and saw exports increase by more than 250%.

Figure 5: Land in use for quinoa production



Second, the higher prices offered for organic quinoa generated a shift from conventional quinoa to organic with total land increasing but the share of land in use for domestic production decreasing. If translated into number of producers this would correspond to a decrease of almost 10% in the supply of quinoa for the middlemen¹⁰. At the same time no evidence exist that demand would have decreased by the same amount. Already by assuming that domestic demand and informal exports to

¹⁰ Based on average landholdings per producer and total number of producers. As the total number of producers might have changed as well this however gives a simplified indication of the change.

Peru were unchanged the reduced supply of available quinoa would drastically increase the competition among middlemen trading in conventional quinoa. As indications exist that the share of conventional quinoa exported to Peru in fact increased during this period there is reason to believe that the increase in competition was even greater than this suggests.

While no data is explicitly available for the difference between prices paid to producers of conventional quinoa and the corresponding export prices this data exist for organic quinoa (see figure 4). Given how prices for conventional quinoa follow that of organic quinoa the same reduction in spreads can be assumed to hold for conventional. There is thus support for competition among middlemen trading conventional quinoa can being high and their margins low. Their market power, as a whole, would consequently be low as well.

5.3 Competition at the marketplace

The composition of middlemen acting out of the marketplace is limited to only three kinds: large wholesalers, small wholesalers and small-scale traders. The latter group is presumably not involved on a regular basis and previous studies have found it difficult to determine their numbers. In the remaining two groups there is estimated to be about three large wholesalers and 30 to 50 small wholesalers, the majority thus being small to medium sized actors. Consequently, there is a large number of both sellers and buyers present at the marketplace which should mean that neither have high possibilities of setting prices. This appears especially true for the smaller wholesalers.

Margins on *quinoa bruta*, quinoa resold without any value added, are reported to be about 1-6% per quintal and all interviewed buyers claim to be unable to offer higher prices. Given transportation costs it can be assumed that the majority of quinoa traded at the lower margins is resold at the marketplace and not transported to other locations. This kind of “intra-marketplace trade” is primarily conducted by the smallest wholesalers, those handling less than 300 quintals per month, and the buyer is usually one of the large wholesalers at the marketplace. Wholesalers handling amounts in the range of 400 to more than 1000 quintal per month report selling to companies outside the marketplace to a greater extent. This creates two groups of buyers at the market: smaller middlemen who act as consolidators of volume for the large wholesalers and larger buyers who independently are able to “export” the quinoa to outside the marketplace. About 50% of the interviewed middlemen fall into the category of small actors selling to the large wholesalers, this was corroborated by one of the large wholesalers who confirmed that she purchases 20% of her volume from other middlemen.

There are no or low costs associated with entering the lowest segment of the market, buying and selling quinoa at the marketplace. As these buyers do the majority of their business at the marketplace they incur no other costs than the opportunity cost of their time and the cost of procuring the quinoa as business is done in the street and only requires transportation within the marketplace. Low loyalty among the producers in who they choose to sell to further reduces any barriers to entry for potential competitors. Competition among smaller buyers at the marketplace thus displays many of the characteristics of a highly competitive market with many small buyers and sellers trading a homogeneous product with perfect information of competing offers and with no or low costs for entry and exit. The upper limit for what price they can offer is decided by the prices offered to them by those whom they sell to, i.e. the large wholesalers. Under these circumstances the ability to set prices for the smallest wholesalers is low and they are operating near zero profit.

However, as the product is homogeneous no middleman can offer a price lower than that offered by the smallest wholesalers. As this price ultimately depends on the price offered by the large wholesalers it appears that the larger wholesalers could hold some market power. Their numbers are also significantly lower at only a handful and their operations require substantial amounts of capital and possibly the ownership of a truck or similar.

The large wholesalers also buy directly from producers and thus they display some pricing power through the existence of a margin between the quinoa bought directly from producers and that from other middlemen as they could offer this price directly to producers. Medium-sized wholesalers at the same time reported margins of 1-6% with, as concluded above, the lower percentiles being for intra-marketplace trade. The medium-sized wholesalers sell their quinoa to the same buyers as the large ones with the amount sold being the only significant difference. These same margins therefore should also apply to the large wholesalers and their pricing power is thus equivalent to the difference between the street price offered to producers and the price offered to smaller middlemen. As shown above this is in the lower range of 1-6%, or Bs. 5-10 per quintal, which is to be considered low. The lower margins earned by large wholesalers when buying from other middlemen can be explained by the value consolidation of volume has to them. By using smaller middlemen as consolidators of volume the larger buyers decrease the number of transactions needed and reduces time spent per transaction as the sorting and weighing is already completed.

Although the margins higher up in the marketing chain weren't studied some evidence exists that supports the case above. As producers in the near area are indifferent between selling in the village or at the marketplace given a price difference of tx middlemen from the marketplace cannot offer a price lower than $p^* - tx$ as they go out. This leads to middlemen earning the same or less profit on each quintal they buy outside the marketplace, as they would offer p^* buying at the market, unless they can take advantage of economies of scale and decrease their cost of transportation per unit to less than that of the producers, tx . Given the already low transportation costs, around 1-2% of the price per quintal, this will require large amounts per trip. Despite this, a majority of the middlemen report visiting villages and producers in the first area in search of quinoa to buy. Assuming all types of middlemen are profit maximizing agents who wish to increase their earnings this behavior indicates that the only way for them to increase their profit is through processing higher volumes, even if this comes at a higher cost.

While collusion and price fixing could exist between all the buyers at the marketplace the homogeneity and mobility of the product would attract the upstream buyers, i.e. processing companies and traders from the Peruvian border market, to come to the marketplace as long as the difference in price was greater than their transportation cost. Margins for wholesalers selling to either processing companies or the Peruvian border market should thus not be in excess of 6% of the price paid to producers. In addition to the above, prices are uniform and known by all actors at the marketplace.

All of the above leads to the conclusion that competition among buyers at the marketplace is close to perfect. Even larger wholesalers, with their smaller number and higher entry barriers, only seem to have very limited market power over the producers at the marketplace.

5.4 Competition near the marketplace

This area encompasses villages and producers located up to five hours away from the marketplace. Producers in the near village independently of size all reported primarily selling directly at the marketplace with only occasional sales for convenience to middlemen in the village. This was confirmed by the buyers at the marketplace where a majority of the middlemen purchased all their quinoa directly from producers who brought quinoa to the market. The buyers identified an area within a radius of four to five hours from the marketplace as the source of all sales to them, this area also with few exceptions corresponded to the area they themselves were willing to visit in search of quinoa. Further support for this geographical division are the spot-checks of sellers performed at the market which confirmed that producers from quite large distances away were present. While it could be the case of a black swan, no seller came from outside the area defined above and the following should thus be applicable to the entire area.

Producers in the near village described competition among visiting middlemen as “high” despite the numbers of middlemen not exceeding five. Solely based on this it could thus appear that there is a large amount of small sellers with relatively few buyers. With transportation costs to the marketplace between five and ten Bolivianos per quintal, or 1-2% of the market price, and with a time consumption of a few hours the opportunity cost for the producer is, however, low to bring the quinoa directly to the marketplace. The direct access to the marketplace effectively makes the competition among middlemen operating in this area equal to those trading at the marketplace. Since even the smallest of producers, those normally most likely to need the assistance of middlemen, face no problems in selling quinoa directly the dependence on middlemen for marketing is to be considered very low. As the marketplace also trades in all kinds of goods it can be believed that producers may visit the market for stocking up on supplies and other goods as well which further reduces the opportunity cost associated with selling at the market. Additionally, frequent visits to the market also facilitate a better knowledge of prices, either through firsthand accounts, through neighbors and/or family, or via phone which also increases the bargaining power of the producer. Producers in the near village were all fully aware of prices and costs associated with selling their quinoa.

The strong bargaining power of producers in the near area is further demonstrated by how the reported difference in prices between the near village and the market equals that of the transportation cost, making producers indifferent to where they sell their quinoa. While not all buyers operate out of the marketplace those who don't will need to offer the same or higher price as the producer can receive by selling directly at the market in order to strike a deal as producers are perfectly aware of the competing offers from other buyers.

In effect, the competition throughout the whole first area is determined by the competition that exists at the marketplace and producers will never earn less than the difference between the price offered at the marketplace minus the cost of transportation as long as they can sell straight to the market. This is mainly explained by the proximity to the marketplace and the ease with which producers can transport their quinoa and themselves there.

5.5 Competition at a medium distance from the marketplace

Dependence on middlemen for marketing of quinoa is much greater outside the zone with ability to sell directly at the marketplace. In the middle village middlemen constitute the primary channel for selling quinoa with all interviewed producers selling through them in the village. The high dependence on middlemen combined with low price awareness and limited transportation options fulfill several of the prerequisites for a situation where middleman market power potentially could be high and competition low.

Producers in the middle village, however, claim there to be high competition in their areas as well. Once again using the model presented by Chau et al. the concentration of middlemen should, through the interplay between transportation and the fixed costs for visiting one additional producer, go down and increase middleman market power. More remote areas should thus see lower numbers of middlemen. This is, however, not the case.

While exact numbers of middlemen for each location are difficult to specify due to their informal nature it is clear that there is no less than two middlemen or more than five operating in each of the locations. Both McMillan et al. and Chau et al. emphasize that the important number is the number of buyers the producers have access to, in the latter's case so that they can rank the various offers and choose the highest. With the decreasing frequency of visits for the more remote locations it is unlikely that there is any more than one middleman present at the same time throughout much of the year. Through this way of reasoning the number of simultaneous offers available to the producer should be one. It is, on the other hand, possible to store quinoa for sale at a later point in time. The visits of middlemen, albeit infrequent, also appear to be rather predictable in time, i.e. there is no doubt that there will be more visits by others in the future. This is something producers can leverage in order to increase their own bargaining power as they are able to wait for a better offer if the first offer received wasn't satisfactory, unless there is an immediate need to sell their harvest. The importance of the frequency of visits is thus reduced and it can be argued that it is in fact the total number of visiting middlemen that is relevant. This number is still relatively low at no more than five middlemen regularly visiting the village but it still provides the possibility of competition.

A prisoner's dilemma type of situation where collusion would be better for the middlemen can easily be imagined. The probability of striking a deal is, however, dependent on the actions by the other buyers while these are unobservable to the others given the difference in time of the visits. Failing to strike deals will lead to the middleman incurring the higher costs of visiting the remote location without being able to purchase the required amount to make up for the transportation costs. While no margins were directly observed due to the lack of recent sales to compare with it is possible to make some general assumptions. Given the high competition prevailing in the area nearest the marketplace and the virtually non-existent margins there it can be argued that the existence of higher margins further away would attract buyers from the nearer area. Producers do not show any loyalty in who they sell to but are driven by the highest price on offer and middlemen similarly claim not to have any specific relations with certain areas. This would indicate that margins are no different for the more remote locations once adjusted for distance specific costs.

Despite the low number of buyers in the area and low awareness of prices the storability of quinoa weakens the bargaining power of the middlemen. With competition being very high in the areas closer to the marketplace were buyers not to offer acceptable prices to the producers this would

attract middlemen from the nearer areas as there are low barriers to entry. With the middlemen being aware of this their willingness to strike a deal by offering a price more acceptable to the producer would increase. Competition in this area is thus not the result of many competing buyers but rather a protective behavior from those already present.

The opportunity for producers to decline offers when selling quinoa decreases when the sales are made for necessity purchases. These potentially higher margins for the middlemen need however to be put in relation to the opportunity cost for the producer. While not the whole profit from selling quinoa is likely to be spent on purchases from the middleman it is reasonable to presume that at least a fair percentage of small sales are for this purpose. Obtaining these goods through other channels would naturally also incur certain costs, such as traveling to the nearest town, which needs to be taken into account.

Overall, the market power of middlemen at the medium distance is low as well.

5.6 Competition at a long distance from the marketplace

Although producers in the remote village mainly sell through associations, other locations at a similar distance display lower percentages of producers affiliated with associations. These unaffiliated producers would be left with middlemen as the main option for commercialization in the same way as can be seen in the middle village. It is therefore reasonable to assume that there still exists a market for middlemen in this area as well, although not as large as for the areas located at a medium long distance from the marketplace. Aside from the higher transportation costs and more limited role of middlemen there appear to be no difference between the most remote village and the middle village.

Similar to the middle village producers in the remote village claim that there is high competition and the number of middlemen in the remote village is no different than in the middle village despite being located significantly further away. The same arguments presented for the middle village are therefore also valid for the remote village. The main incentive for middlemen to operate on margins equal to those of other areas is to protect their business from entry of other competitors. The associated opportunity costs are higher for this area which would make it less attractive to middlemen but this would be compensated through, slightly, lower prices.

There is therefore nothing that suggests that the market power of middlemen at the long distance from the market place is any different than that at a medium distance. As this was concluded to be no different from the near area nor the market place, competition appears to be high throughout Bolivia and the market power of middlemen consequently low.

6. Conclusion

Similar to many other places in the world there exist different opinions on the role of middlemen and their potentially exploitative behavior in the market for quinoa in Bolivia. Some call them an evil mafia while others recognize them being an important part in the marketing of quinoa for producers who lack sufficient capital and/or volume to do so themselves. Producers are keen on cutting out the role of the middleman in order to sell directly to the consumers but none give the impression of being exploited by the middlemen. Instead, producers in all three locations studied claim that competition is high among middlemen and they have no difficulties to sell their quinoa. Some middlemen indeed go as far as to claim that they are being squeezed between producers exercising their bargaining power and processing companies setting prices. This picture is supported by many of the findings of this thesis.

Over the past decade prices on quinoa have more than doubled and exports have displayed a dramatic increase. As much of this demand have been for organic quinoa this has led to more producers shifting to organic instead of conventional, thus reducing the supply available for middlemen handling the latter while demand has gone up. The increased competition can be observed at the marketplace for quinoa in southern Bolivia where a situation that can be described as near perfect competition exist among the wholesalers operating there. This high competition comes from low costs associated with trading in quinoa which means no or low barriers to entry or exit exist, a homogeneous product and a high demand from outside markets. Prices offered at the marketplace are uniform and the margins earned by the wholesalers are in the range of 1-6%, including for those who transport the quinoa large distances. Given the intense competition middlemen have very low market power and possibilities of offering prices below those decided by the market.

This situation is extended to the area located within four to five hours of the marketplace as producers there have the possibility of selling directly at the marketplace. Middlemen operating in this area are thus exposed to the same competition prevailing at the marketplace, effectively eliminating any market power they might have over producers. As distances increases so does the dependence on middlemen for selling quinoa. There is however no observable increase in the market power of middlemen despite this. Instead, the number of middlemen operating in the most remote village is the same as the number of middlemen in the nearest. This is explained by the high competition prevailing in the area closer to the marketplace and the spillover of competition larger profits in the more remote areas would generate. The physical properties of quinoa help to sustain the bargaining power of the producers as it can be stored in expectation of better offers and a low volume still generates a significant profit, as well as making it cheaper to transport.

The conclusion is that the market power of middlemen trading quinoa in Bolivia is low. While the dependence on middlemen increases with distance the competitive situation and their market power does not. Instead, competition appears uniform in all quinoa producing areas. There does thus not exist any evidence that middlemen are taking advantage of their position and are exploiting producers, irrespective of how remote the village is.

7. Reflections

The low market power of middlemen trading quinoa in Bolivia is most likely strongly correlated to the large increases in price and demand that the market has experienced over the past years. Due to this high external demand middlemen are willing to travel throughout the entire area in search of quinoa to buy. While high demand for a product is not unique to the case of quinoa and Bolivia some key differences however exist that separates quinoa from many other agricultural products and strengthens the position of the producers.

The first such difference is the fact that quinoa is almost exclusively produced in Bolivia and Peru and that no quinoa is imported to Bolivia. This geographical concentration of production strengthens the position of exporting companies as they face little or no competition from other parts of the world. While Peruvian coffee is readily substituted by coffee from Central America or Indonesia for example, there are no substitutes for quinoa from other parts of the world. As control of the supply thus is limited to Bolivia and Peru, control of prices is also to a larger extent concentrated here. This leads to a potentially lucrative market which attracts more competitors and in turn leads to a trickling down of competition to eventually reach the stage of the producer.

Second, the physical properties of quinoa are somewhat different from many other crops. Specifically the ability to store quinoa for longer amounts of time, as opposed to mandarins or tomatoes to mention only two, increases the producers bargaining power as the immediate need to sell the crop after harvest is not the same. Middlemen trading in perishable goods are able to leverage this when offering prices as producers are faced with the choice of selling to a bad price or risk losing the whole crop. For quinoa this is the reverse as producers are able to withhold supply of the crop until a sufficient price is offered. While this does not take into consideration the potential need for producers to sell their crop due to financial reasons this is a problem all producers face, independent of crop.

Bolivia also has a long history of producer associations acting on behalf of the producers. These have been active for more than 30 years and have, if nothing else, provided an alternative for producers. While currently dealing with organic quinoa this has still increased the competition for land available for production, something that will have had direct effects on the volumes available for middlemen trading conventional quinoa too. Without the increase in demand from the export markets the benefits of the associations would however have been mainly limited to the member of the organizations.

Despite being a competitive market there are still ways middlemen in Bolivia cheat producers. The mentioned tampering of scales and handling of bags are but two ways. None of these however appear widespread as no producers mentioned these problems, which likely also is an effect of the high competition and the low loyalty among producers when it comes to who they sell to.

The role of the middleman, in this case at least, is that of an agent providing a service like any other at prices decided by the market forces. With middlemen functioning like this there is no need to strive to eliminate their role, instead they can indeed provide valuable services and products to the rural communities.

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8.1 Interviews

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- Mamani, P. M. Area Responsible for Producer Contacts, Fundación AUTAPO (FAUTAPO)
- Silguer, J. C. President, ASPASA.
- Soriano, R. L. Independent Consultant, Desarrollo Económico Rural.
- Tapia, M. L. Area Coordinator for Rural Development Services and Products, Asociación Boliviana para el Desarrollo Rural (PRO-RURAL).

Additionally, 30 producers and 25 middlemen were interviewed in their respective village or at the marketplace. These interviews are non-attributed due to their informal nature and relative brevity.

Appendix 1 – Full list of quinoa producing locations and variables

Municipality	Santuario de Quillacas	Tahua	Santiago de Huari	Uyuni	Salinas de Garcia Mendoza	Llica	Colcha "K"	Pampa Aullagas	San Pedro de Quemes	San Agustín	San Pablo de Lipez
Distance from Challapata	Short	Short	Short	Medium	Medium	Medium	Medium	Medium	Long	Long	Long
Production/producer, qq	36	14	5	82	69	52	35	16	65	28	6
HA/family	3,30	1,00	0,51	6,87	6,25	4,35	2,66	1,55	5,46	2,19	0,53
Total production, quintals	57586	8708	11775	162428	192250	59337	81468	11200	12700	12369	192
Share of quinoa for sale	94%	87%	85%	96%	97%	95%	92%	89%	96%	90%	61%
Yield, qq/ha	11	14	9	12	11	12	13	10	12	13	12
Municipal area, km ²	1827	9356	2084	9584	5819	7286	18412	1187	4193	2304	14188
Land in use for quinoa, ha.	3310	646	1242	12975	17045	4816	5957	1133	925	964	16
Municipal population	2265	1497	7712	19648	5761	3133	7733	1602	587	1313	2412
No. of producing families	1585	620	2577	1970	2798	1137	2358	722	194	435	30
No. of permanent producers	620	228	374	1193	1194	629	1439	244	98	254	15
Producers / municipal population	27%	15%	5%	6%	21%	20%	19%	15%	17%	19%	1%
Population density	1,24	0,16	3,7	2,05	0,99	0,43	0,42	1,35	0,14	0,57	0,17
Membership in association	327	54	134	657	1524	657	266	75	284	N/A	18

Appendix 2 – Interview guide for buyers and sellers

Structured questions to middlemen at the marketplace:

1. How many quintals do you trade per month?
2. To whom do you normally sell the quinoa?
3. From what area do the sellers come? (Measured in time and/or distance)
4. How many percent do you buy direct from producers?
5. How many other middlemen are there at the marketplace?
6. Do you visit villages in search of quinoa to buy?
7. What area do you normally visit then? (Measured in time and/or distance)
8. How many competing middlemen operate in the same villages as you?
9. How many villages do you visit?
10. Is there a minimum/maximum volume you require in order to undertake a tour?
11. Are there fewer or more competitors now than two years ago?
12. Do you buy from the same or different sellers?
13. What margins do you have on your buyers?
14. Do you process quinoa yourself?
15. Why don't you offer a higher price at the marketplace?
16. Other information?

Structured questions to producers at the marketplace:

1. Where do you come from?
2. How many quintals did you sell?
3. Did you sell for someone else than just you? Who?
4. What price were you paid?
5. What type of quinoa did you sell?
6. How do you usually sell quinoa?
7. How many middlemen usually come to your village?
8. Other information?

Structured questions to producers in the villages:

1. How many hectares do you use for quinoa?
2. Have you sold quinoa in the past three months?
3. What price were you paid?
4. What type of quinoa did you sell?
5. To whom did you sell?
6. Do you know the current price at the marketplace?
7. Where/to whom do you usually sell quinoa?
8. How much does transportation cost to the marketplace?
9. How many middlemen visit this village, on average? (1, 2-3, 4-5, >5, >10)
10. Do you perceive it to be high competition among middlemen here?
11. Other information?

Appendix 3 – Illustration of quinoa grains and plants



Quinoa grains. Photo: Emily Barney



Quinoa. Photo: The Dabble



Quinoa plants. Photo: twiga269