An Economic Evaluation of Alternative Coffee Trading Regimes

by

Fátima Luna

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This Thesis has been approved on the dates shown below

Paul N. Wilson

Professor Paul N. Wilson

Agricultural and Resource Economics

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Date

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ABSTRACT

Produced in fifty-six countries, coffee is a key source of income for twenty to twenty-five million farmers and farm workers around the globe (Nicholls and Opal 2005; Lewin, Giovannucci and Varangis 2004). In addition, small-scale coffee farmers with less than ten hectares account for about seventy percent of the coffee production worldwide (Fridell 2007). Although small-scale coffee farmers play such an important role in the coffee industry, they receive the smallest income share in the conventional coffee trading system. This study compares and contrasts three coffee trading models currently functioning in Chiapas, Mexico—the conventional, fair trade, and vertically integrated models—and test the hypothesis that the small-scale coffee farmers who are vertically integrated from production to retailing are better off than farmers in the fair trade and conventional coffee trading regimes. Using both qualitative and quantitative analysis, this study found that (1) coffee farmers organized into cooperatives are better off than non-aligned conventional farmers, (2) fair trade farmers are better off than vertically integrated farmers, while conventional farmers are the worst off, and (3) the coffee revenue of female headed households is less than other household units.

Chapter One: Introduction

Coffee Industry

Native to the highlands of the Kaffa province in Ethiopia, coffee has reached almost every corner of the world, changing the lives of millions of people who produce and consume it. Although coffee was first used as a medicine or a religious aid to stay alert for late-night prayers, in the fifteenth century it became a popular social drink among the elites in the Arabian Peninsula (Pendergrast 2010). This popularity made coffee a luxury good, motivating Europeans to build coffee plantations in their colonies, where African slaves and native people worked under coerced conditions (Martinez-Torres 2006). The Industrial Revolution then changed forever the production and consumption of coffee. The creation of the steam engine allowed ships to travel longer distances at lower costs facilitating the transportation of coffee around the world and transforming it from a luxury to a good commonly consumed by the European working class. Approximately 2.25 billion cups of coffee are consumed on a daily basis today (Dicum and Luttinger 1999).

Although there are more than twenty species in the genus *Coffea* family, Arabica and Robusta account for eighty and twenty percent, respectively, of the world's coffee production (Coffee Research Institute 2006). There are two main types of Arabica variety: milds and natural Arabica (see table A.1 for details on type of coffee grown by region). In general, Arabica beans are better quality, have superior aroma and taste, and are less caffeinated compared to Robusta (Dicum and Luttinger 1999; Jaffee 2007). In fact, the caffeine content of Arabica beans ranges from 0.8-1.4% while that of Robusta is 1.7-4.0%. Higher quality Arabica coffee requires fertile soils, higher maintenance and manual collection whereas Robusta can grow in poorer soils, requires less maintenance and can be harvested mechanically (Tuvhag 2008). The cost of production for Arabica coffee is fifty to eighty percent higher than that of Robusta (Pay 2009).

The optimum altitude to grow Arabica coffee is from 1000-2000 meters while Robusta can grow from 0-700 meters. Arabica, furthermore, is a more delicate coffee tree than Robusta; it is more susceptible to diseases (coffee rust and coffee berry borer being the most common), and less resistant to adverse weather conditions. For details on the differences between Arabica and Robusta see table A.2.

International Coffee Market

While coffee is grown throughout the tropical and subtropical regions of the globe, it is mainly consumed in northern countries. Coffee is the fourth most traded commodity in the world. For agricultural commodities, coffee is the fourth most valuable commodity after wheat, soybeans and maize and for non-agricultural commodities after cooper, aluminum and oil (FAO 2011). Produced in fifty-six countries, coffee is a key source of income for twenty to twenty-five million farmers and farm workers around the globe (Nicholls and Opal 2005; Lewin, Giovannucci and Varangis 2004). About seventy percent of the coffee worldwide comes from small-scale farms of "less than ten hectares and of this the vast majority are small family plots between one and five hectares" (Fridell 2007, p. 102-103). In Burundi and Ethiopia, coffee accounts for eighty and fifty-five percent of the country's total exports, respectively, making these economies extremely vulnerable to the changing forces of the coffee market (Jaffee 2007).

In the 2011/12 crop year, world coffee production is estimated at 131.4 million bags, decreasing slightly from 134.4 million bags in 2010/11 (ICO 2012b). South America, the largest coffee producer, accounted for about forty-five percent of the total world production, followed by Asia and Oceania (28%), Mexico and Central America (14%) and Africa (13%) (ICO 2012b). The top ten coffee producing countries account for about eighty-three percent of the total coffee production among major producing nations. Accordingly, the top ten exporting nations, which

include all the major producers, with the exception of Uganda and Ethiopia, represent about eighty-six percent of total coffee exports worldwide (see Table 1.1).

Table 1.1 Top Ten Coffee Producing and Exporting Nations, 2011 (in thousand bags)

Producing Nations			Exporting Nations		
Country	Production	% Share	Country	Exports	% Share
Brazil	43,484	40	Brazil	21,834	31
Vietnam	20,000	18	Vietnam	18,325	26
Indonesia	8,250	8	Colombia	5,636	8
Colombia	7,800	7	Indonesia	5,214	7
Ethiopia	6,500	6	India	4,423	6
Peru	5,492	5	Honduras	4,260	6
India	5,333	5	Peru	2,984	4
Honduras	4,500	4	Guatemala	2,652	4
Mexico	4,300	4	Mexico	2,415	3
Guatemala	3,750	3	Uganda	2,012	3
Total	109,409	100	Total	69,755	100

Source: ICO 2012b

While total exports in the 2010/11 crop year reached the highest ever recorded amount with 103.7 million bags, the total exports recorded for the first three quarters of coffee year 2011/12 amounted to 81.2 million bags, representing a decrease of 0.3 percent compared to previous year (ICO 2012b).

World coffee production has been increasing by an average of 3.30 percent per year since 1970. The increases in world coffee supply were driven by higher prices, lower production costs, and the entrance of new producers, like Vietnam (Lewin, Giovannucci and Varangis 2004; Daviron and Ponte 2005). With the exception of Brazil, the major consuming nations are located in northern markets. The United States is the leading consuming country with sixteen percent of the world's consumption, followed by Brazil, Germany, Japan, Italy, and France (see Table 1.2).

Table 1.2 Top Ten Coffee Consuming Nations, 2010 (in thousand bags)

Exporting Nations			Importing Nations		
Country	Consumption	% Share	Country	Consumption	% Share
Brazil	18,945	46	USA	21,783	33
Indonesia	3,333	8	Germany	9,292	14
Ethiopia	3,253	8	Japan	7,192	11
Mexico	2,239	5	Italy	5,781	9
Philippines	1,973	5	France	5,713	9
India	1,713	4	Russian Fed.	3,661	6
Venenzuela	1,650	4	Canada	3,586	5
Vietnam	1,583	4	Spain	3,131	5
Colombia	1,400	3	UK	3,134	5
Others	5,231	13	Poland	2,156	3
Total	41,320	100	Total	65,429	100

Source: ICO 2012b

The total worldwide coffee demand was 135 million bags in the 2010/11 crop year. In the 2011/12 crop year, total global consumption is forecasted to be approximately 136.5 million bags, an increase of about 1.01%. This increase in world consumption can be accredited to the growing demand in emerging countries, and the rising domestic consumption in exporting countries (ICO 2012b).

Stages of the Coffee Industry

The coffee industry, as any other industry, is driven by the economic forces of supply and demand. These forces have been interacting to create booms and bursts in recent decades. The cycles in the coffee industry have strongly impacted both positively and negatively small-scale coffee farmers. In more recent years, the supply and demand for coffee has dramatically changed because the coffee industry has gone from a relatively regulated and managed market, where producing countries influenced the international price of coffee through international commodity agreements, to a free market where competitive forces have exposed producers to market power and uncertainties (Petchers and Harris 2008; Fridell 2007; Daviron and Ponte 2005).

The Regulated-Managed Market (1962-1989)

From 1962 to 1989, the global coffee market was regulated by the International Coffee Agreement (ICA)—an agreement between major producing and consuming nations forming the International Coffee Organization (ICO) which stabilized world coffee prices by imposing a system of export quotas (Petchers and Harris 2008; Jaffee 2007). Under the ICA regulatory system, a price band between USD$1.20 and USD$1.40 per pound of green coffee was set. The export quotas, assigned to each producing country, were relaxed when the indicator price determined by ICO was higher than the price band, and tightened when it was lower. Additionally, export quotas were suspended when coffee prices increased sharply until prices declined to levels within the band (Daviron and Ponte 2005). As such, export quotas were in effect from 1962-1972 and 1980-1989, and temporarily suspended twice (1973-1980, 1986) before being canceled in 1989 (Talbot 1997).

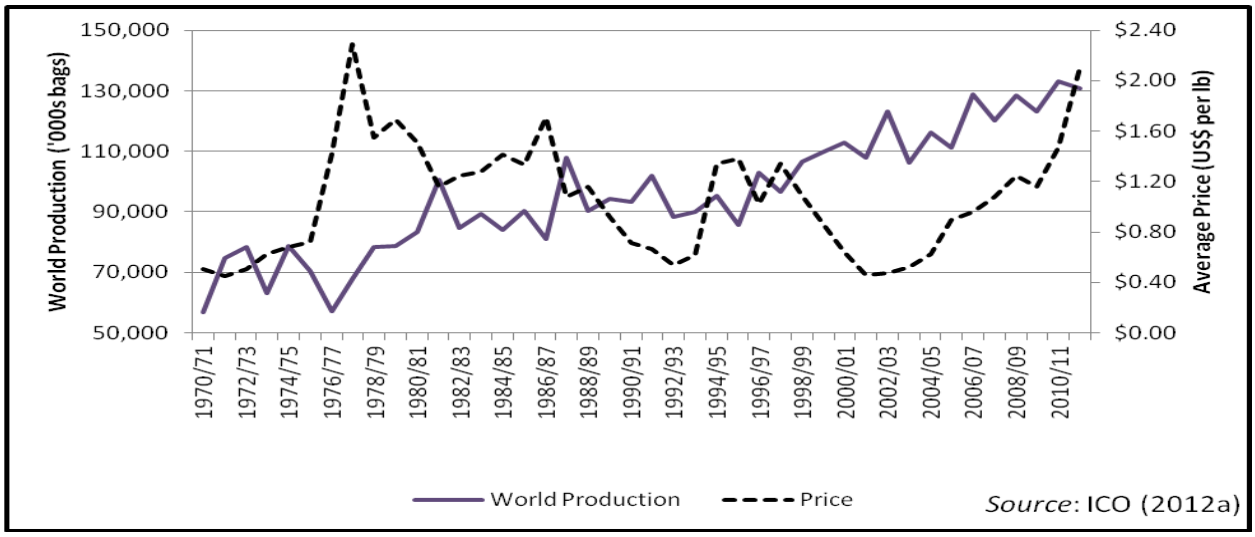

Figure 1.1 World Coffee Production & Average Coffee Prices (1970-2011)

As Figure 1.1 shows, international coffee prices were maintained, for the most part, at high levels during the ICA regime, while experiencing low levels in the post-ICA period with an outstanding recovery in the current period. As the largest producer in the world, the 1975 Brazilian frost caused world coffee production to decrease by about seventeen percent from

crop-years 1974/75 to 1976/77. The decrease in coffee supply triggered coffee prices to a record high (USD$2.30 per pound) in the 1976/77 crop-year. This sharp price increase, in turn, caused export quotas to be temporally suspended in 1976/77. In addition, the pronounced increase in prices encouraged some countries to plant new coffee trees in 1975 and expand their production for the consecutive years. In general, it takes two years for new trees to produce cherries, but optimal yields take from four to five years. Nevertheless, once planted, coffee trees can be productive up to twenty-five years. As such, "a usually brief situation of supply shortage and high prices will then be followed by a longer period of oversupply and low prices"(Daviron and Ponte 2005, p.111). As the 1975 new trees began to produce, coffee prices suddenly fell from 1977 to 1981, with a small increase in 1979. After 1980, when export quotas were reinstated, world coffee prices and global coffee production moved almost in opposite directions; as supply decreased, prices increased and vice versa. In 1986, when the quota system was suspended for the second time, coffee prices reached a zenith of USD$1.70 per pound only to be followed by declining prices thereafter. These falling prices led ICA member countries to revive the quota system in 1987. This effort, however, was interrupted in 1989 when the ICA was completely annulled. Despite the fact that the ICO no longer regulates prices directly through export quotas or buffer stocks, the ICO continues to collaborate with producing and consuming countries to foster international cooperation on coffee issues.

Scholars believe that the collapse of the ICA was instigated by the United States' abandonment of the agreement in 1989 (Nicholls and Opal 2005; Calo and Wise 2005; Petchers and Harris 2008). As the largest coffee importer, the abandonment of the United States was detrimental to the economic funding of the ICA's "buffer stock" (Calo and Wise 2005)[1].

[1] Buffer stocking is the activity of buying and storing commodities when there is a surplus in the

Furthermore, agreed quotas were not respected by some countries (e.g. Brazil and Colombia) that sold coffee to non-ICA members at prices lower than the ICA band, undermining the arrangement and adding to the coffee oversupply, and thus leading to further reductions on prices (Petchers and Harris 2008).

The collapse of the ICA in 1989 brought devastating outcomes for coffee producing nations. During the months following the ICA collapse large proportions of coffee stocks were transferred from producing countries' harbors to those of consuming countries, decreasing the global influence of the former (Daviron and Ponte 2005). Using data from the ICO, Talbot (1997) examines the income and surplus share between producing and consuming nations created in the traditional coffee value chain for the years of 1975-1995. In the regulated period (pre-1989), there was no clear indication of skewed control of the coffee chain from producing or consuming nations. In fact, Talbot (1997, p. 86) concludes that during most of the early 1960s to late 1980s period, "roughly half of the total surplus generated along the entire chain was retained in the producing countries," with the other half going to consuming countries.

During the deregulated period (post-1989) producing countries began to lose control in the coffee value chain. In 1989, the income share of producing countries dropped from twenty-five to fifteen percent with total surplus decreasing from forty percent to not having a surplus at all. In the same year, the income share of consuming nations increased from sixty-seven to seventy-five percent with fifty percent being surplus (Talbot 1997). That is, in the late 1980s the gap between the income share and total surplus in producing and consuming nations widened. As illustrated in figure 1.2, from 1975/76 to 1985/86, the value-added in consuming and producing countries was moving almost in the same pattern and its difference was fairly stable throughout

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market economy and selling them when there are shortages with the purpose of stabilizing prices (Nurkse 2007).

this period. From 1986/87 to 1994/95, and especially after 1988/89 there was a clear change not only in the movement in direction of the value-added, but also in the magnitude (e.g. the gap) between in consuming and producing countries. That is, the total income share in producing countries was steadily decreasing, while that of consuming nations was increasing.

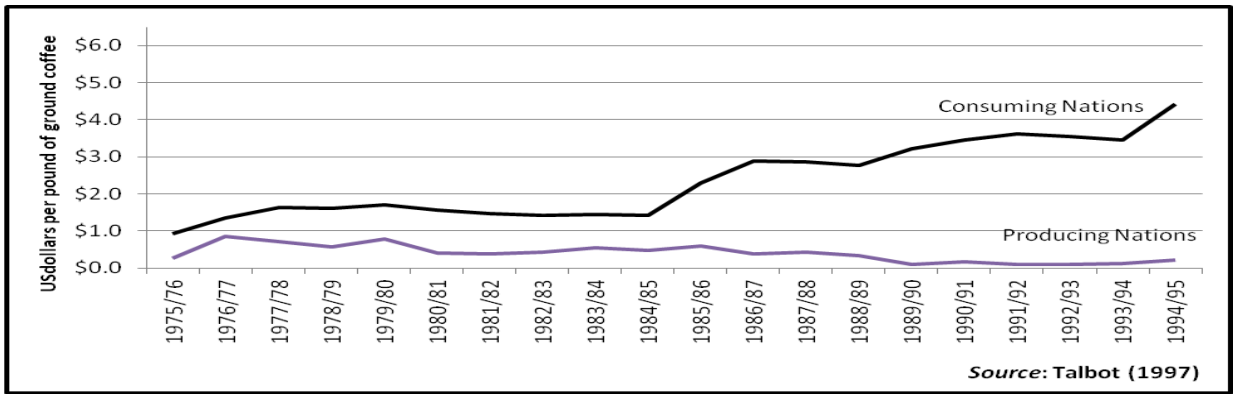


Figure 1.2 Value-Added in Consuming and Producing Countries

This translated into a bigger gap, although not as pronounced, between the price paid to growers and the final retail price. From 1975/76 to 1987/88, the difference of value-added in the retail price and the price paid to growers was on average USD$2.70 per pound of ground coffee, increasing to an average difference of USD$3.95 per pound of ground coffee from 1988/89 to 1994/95 (see figure 1.3). In Mexico, the post-1989 period caused "small producers [to] experienced a seventy percent drop in income, and [to] abandoned their coffee plots and migrated out of coffee-growing regions" (Jaffee 2007, p. 43).

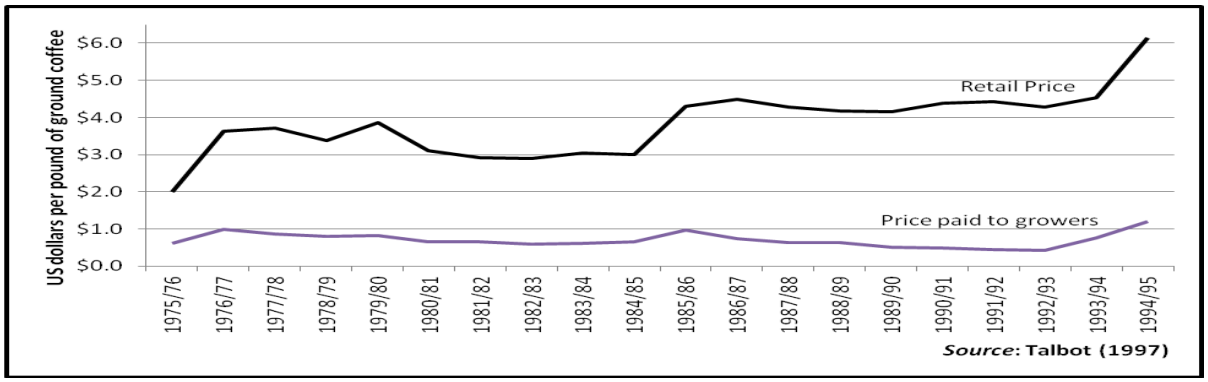


Figure 1.3 Income Share: Farmers vs. Retailers

However, the normal reaction for many producing countries in the post-ICA era was to increase their coffee production and exports since they no longer had a quota. That is, exposed to freer trade, producing countries began to dump their stocks on the market, flooding the coffee industry throughout the decade (Jaffee 2007).

Market Deregulation: The Free Market (1989-present)

The entry of new countries into the global coffee market and the increased supply of existing producing countries exacerbated the supply of coffee, putting downward pressure on prices. During the 1990s, the World Bank, the Asian Development Bank and the French government financed the "full emergence" of Vietnam into the global coffee market (Jaffee 2007). The Vietnamese government, for example, provided irrigated land and subsidies as an incentive for farmers to focus on coffee production (Petchers and Harris 2008). Raising its coffee production—from 1.5 million bags in 1991 to 18.5 million bags in 2011—Vietnam quickly moved from the tenth to the second largest coffee producing and exporting country in the world (Jaffee 2007; Petchers and Harris 2008; Calo and Wise 2005).

At the same time, Brazil promoted the expansion of coffee production through a "mechanized and input-intensive model of cultivation" increasing its production by fifty-six percent (Daviron and Ponte 2005, p. 59). Both Brazil and Vietnam gained market power from more technological production and lower production costs by mainly producing Robusta coffee which requires less maintenance and is less labor intensive (Tuvhag 2008). At the same time, coffee production was increased in India and Uganda by more than thirty percent, in Guatemala by twenty percent and in Ethiopia by twenty-five percent (Lyon 2011). Taken together, these 1990s' initiatives added a million bags of coffee into the already saturated market, further decreasing international coffee prices, which hit a record low of about USD$0.50 per pound in

1992 (Calo and Wise 2005; Daviron and Ponte 2005). In 2001, the coffee prices fell further to about USD$0.46 per pound, the lowest price in real terms for 100 years, causing devastating effects on small-scale coffee farmers. Although the effects of the low prices in the 2001/02 crop year varied based on farmers' dependency on coffee, the most detrimental effects included increased indebtedness, abandoning their coffee fields, moving to cities or other countries, and switching production to illegal drugs as was the case in Colombia (ICO 2002). While coffee production was increasing at an annual rate of 3.6 percent in 2002, demand was rising at a lower rate of 1.5 percent (ICO 2002). In order to target the low prices and the adverse effects these prices had on producers, in 2002 ICA proposed a number of activities from both producing and consuming countries. Among the most significant propositions were quality improvement, diversification, and coffee promotion in new markets (ICO 2002). The quality improvement proposition was mainly directed to Vietnam and Brazil, who were introducing lower-quality Robusta and Arabica coffees to the market, thereby lowering prices in the early 1990s. However, adverse weather conditions, particularly in Central America, triggered a rise in coffee prices since 2002.

The consumer environment—the demand side—has also been changing and playing a significant role in shaping the coffee industry. Among the most noticeable changes are the movement away from traditional to emerging specialty markets, and the increase in consumption in coffee exporting countries (ICO 2012; Lewin, Giovannucci and Varangis 2004). In general, traditional coffee markets are characterized by providing a standard coffee product with basic varieties including regular, decaffeinated, roasted, grounded, and instant coffees. At the beginning of First World War (and continuing today), roasters were acquired by major food conglomerates in an oligopolistic market. Kraft, Nestle, Sara Lee, Procter & Gamble, and Tchibo

now dominate the roasting industry as they purchase about half of the world's coffee supply (Nicholls and Opal 2005). Throughout the 1980s, the roasting industry prioritized providing their customers with low and consistent prices rather than offering quality coffee (Dicum and Luttinger 1999; Lewin, Giovannucci and Varangis 2004). Roasters began using cheap beans and cutting down roasting times to reduce weight loss, decreasing the quality of coffee and homogenizing blends (Daviron and Ponte 2005).

Offering affordable coffee at the expense of quality in the 1980s led to reduction in coffee consumption[2]. By the 1990s, per capita consumption for traditional coffee products was declining at a rate that alarmed roasters and retailers and led them to re-invent the coffee product by investing in product innovation and segmentation, and thus increase value added (Daviron and Ponte 2005; Lewin, Giovannucci and Varangis 2004).

As a result, the market for specialty coffee emerged. Inspired by the few coffee-shops that managed to keep high-quality coffee and provide a "third place" (not home or work), where consumers could satisfy consumption needs as well as needs for companionship and emotional support (Rosenbaum 2006; Dicum and Luttinger 1999)[3]. The specialty market provided quality coffee, where a product's origin, processing, and cultivation method was taken into account at the retail level. For the most part, Arabica coffee is used in specialty coffee drinks due to its higher quality. During the 1990s, the specialty coffee market spread widely throughout the United States, growing at an eight percent rate and amounting to $5 billion in retail sales in 1998 (Dicum and Luttinger 1999). In 2000, the specialty coffee industry accounted for seventeen

[2] At the same time, the coffee industry was battling with the soda industry, which presented coffee as a dull and bitter drink, while soda ads were young and hip attracting younger consumers (Dicum and Luttinger 1999).

[3] Starbucks played an important role in making coffee a sophisticated drink and leading the specialty coffee movement.

percent of total coffee imports in the United States (Daviron and Stefano 2005).

It was at this point that major conglomerates (e.g. Kraft, Sara Lee, Proctor and Gamble, Nestle), took notice of the high demand for specialty coffee and entered the market. Their approach, however, was different. Instead of focusing on quality coffee, they took advantage of the lower production costs and higher productivity of Robusta coffee and enhanced the quality of Robusta using processing methods to then sell it as a differentiated "specialty" coffee (Lewin, Giovannucci and Varangis 2004).

As previously mentioned, Robusta coffee has a bitter and harsh flavor when compared to Arabica. The sensory characteristics of Robusta, however, can be improved by using the wet processing method and the new technique of steam-cleaning. Both processing technologies reduce bitterness and harshness creating a milder taste (Mendes, *et al* 2001; Lewin, Giovannucci and Varangis 2004; Daviron and Ponte 2005; ITC 2012). There are, however, critics who believe that the steam-cleaning method strips Robusta from all of its coffee essence, leaving a bean that does not taste like real coffee. While Robusta is used historically for espresso based coffees (e.g. lattes and cappuccinos), Robusta is also mixed with sugar and different flavors to create differentiated "specialty" coffees such as "hazelnut mocha instant" and "French vanilla instant". These differentiated instant coffees are perceived by retailers as a great opportunity to expand coffee consumption among non-coffee drinkers. Tea-drinking countries are specially targeted not only because instant coffee resembles the tea preparation process (easy and quick), but also because it is inexpensive and does not require purchase of additional equipment (e.g. filters, percolators etc.) as with ground coffee (Lewin, Giovannucci and Varangis 2004).

The new milder tasting Robustas, combined with its lower production and retail costs, have encouraged roasters and retailers to increase their purchases in new coffee drinking

countries in Europe, Asia, and in exporting countries. For example, Brazil, the largest coffee producer in the world, increased its domestic consumption by an annual average of three percent from 1980-2012. The increasing consumption of espressos and cappuccinos—both of which are Robusta- based drinks—has made Brazil the second largest coffee consumer in the world. The increase in Brazil's domestic coffee consumption is driven in part by economic growth, better income distribution and lower unemployment rates (ICO 2012a).

The popularity and growth of the specialty coffee movement caused pioneering corporations, such as Starbucks, to become exactly what they were fighting against; that is, they began to consolidate into major national and transnational corporations that not only homogenized the coffee experience (e.g. automatizing preparation), but also used aggressive predatory tactics to put smaller coffeehouses out of business (Pendergrast 2010). In addition, some roasters and retailers abused the term "specialty" coffee by selling lower-quality conventional coffee as "specialty coffee," causing the US coffee demand to stagnate.

Specialty coffees increased consumer awareness about the environmental and socio-economic conditions facing coffee farmers in developing nations. Media exposure of greedy corporate practices in developing nations also influenced the growth of socially conscious products (Dicum and Luttinger 1999). Coffees that promote long-term environmental, social and economic sustainability, and that are independently certified by an accredited third party, are known as sustainable coffees (Giovannucci and Koekoek 2003; ITC 2011; Lewin, Giovannucci and Varangis 2004; Giovannucci 2001). Organic, shade-grown (or eco-friendly), and fair trade coffees are all sustainable coffees. Sustainable coffees earn price premiums and encourage a set of positive externalities that potentially benefit farmers. While the market for traditional (e.g. non-certified) coffee is stagnating, the market for these sustainable coffees is increasing. In 2009,

eight percent of total exported coffee worldwide was certified as sustainable, compared to only two percent in 2002.

Despite the fact that sustainable coffees have higher retail prices than conventional coffees, consumers in northern markets—known as ethical consumers—are willing to pay the premium to support producers working to achieve a decent standard of living. Hainmueller, Hiscox and Sequira (2011) conducted an experimental study in a major US grocery store chain and found that consumers' demand for "ethical products" is inelastic in comparison to those of conventional products. While the sales of fair trade certified coffee did not change when the price was raised by eight percent, the sales of conventional coffee decreased by thirty percent as the price was increased to nine percent.

Arnot, Boxall and Cash (2006) analyzed differences in consumer responsiveness to price changes in fair trade and conventional brewed coffees in a coffee shop in Canada. They found that out-of-home consumers of fair trade coffee were much less responsive to price changes than conventional consumers. Grebitus, Hartmann and Langen (2009) conducted experimental auctions in Germany to investigate consumers' willingness to pay for differentiated coffee (e.g. organic, fair trade, and cause-related coffees) and found that consumers are willing to pay a premium for differentiated coffees. In addition, the authors found that consumers are willing to pay higher prices for fair trade than other differentiated coffees. Cailleba and Casteran (2009) investigate the link between fair trade coffee purchases and the personal characteristics of buyers and found that gender and age do not influence the decision to buy fair trade coffee. In addition, they found that fair trade coffee purchases increase with the buyer's level of education and standard of living.

The Coffee Value Chain

The coffee trading system is composed of a network of producers, traders, exporters, importers, roasters, wholesalers, retailers and consumers, whose complex relationship has been analyzed through value chain analysis (also known as global commodity chain analysis). Value chain analysis (hereafter VCA) emerged in the early 1990s as an instrument for understanding the transformative nature of economic globalization and international trade (Folke, Riisgaard and Ponte 2010). VCA describes and disaggregates the vertical linkages of different agents involved in the production of a good or service from conception to final consumption (Tuvhag 2008). VCA focuses on the sequence of processes, the usage and flow of inputs (e.g. raw materials, land, labor, etc.) that produce commodities, the geographical distribution of flows, and the series of transactions at each node in the chain (Talbot 2002; Gereffi and Korzeniewicz 1994). VCA also illustrates the importance of competition and innovation between different nodes to explain the distribution of wealth within a chain (Gereffi and Korzeniewicz 1994). VCA goes hand and hand with vertical integration. At the core of VCA and vertical integration is the idea that poor producers, mostly located in low income countries, have an incentive to integrate downstream into more advanced stages in the value chain in order to reduce transaction costs and avoid market failures[4]. The configuration of the coffee value chain can be analyzed through both the geographical and input-output approach (Gereffi 2004).

The Coffee Value Chain Configuration

Geographical Approach

The geographical approach, also known as territoriality, refers to the "spatial dispersion or concentration of production and distribution networks comprised of enterprises of different sizes and types" (Gereffi 1994, p. 97). Some scholars have utilized international trade theory and

[4] Vertical integration will be discussed in chapter three.

comparative advantage to explain this geographical dispersion or concentration of production and distribution networks between producing and consuming coffee nations (Tuvhag 2008, Talbot 1997). Based on the imperatives of the Ricardian Model, all trading nations will generate greater economic benefits if each nation focuses its production on the commodities in which they have a comparative advantage; that is, the commodities with lower costs of production (Ricardo 1821). As such, southern countries were encouraged to specialize on the production of primary commodities, while northern countries centered their production on manufactured goods. This trade relationship systematically put the global south at a disadvantage because primary commodities are income inelastic and their real prices, compared to those of manufactured goods, are more likely to depreciate over time, meaning that as income increases more money is spent on manufactured goods (Fridell 2007). This is important because roughly eighty-three developing nations obtain more than thirty percent of their export earnings from primary commodities; that is, their economies are highly dependent on the production of primary goods (UNCTAD 2008).

In the case of coffee, developing countries were encouraged and/or to forced cultivate coffee during colonial times because, as tropical and subtropical nations, they had the geographical advantage of a well-suited climate for coffee production. In addition, as a labor intensive crop, coffee had to be cultivated in countries where labor was abundant and low-cost; a condition largely found in low income countries. On the other hand, roasting and branding are more capital intensive activities well-suited for industrialized, capital abundant countries. The proximity to the final customer puts importing countries at an advantage because roasted coffee loses its freshness more quickly than green coffee. The proximity to final consumer also increases information about consumer preferences and thus information about the “wants and

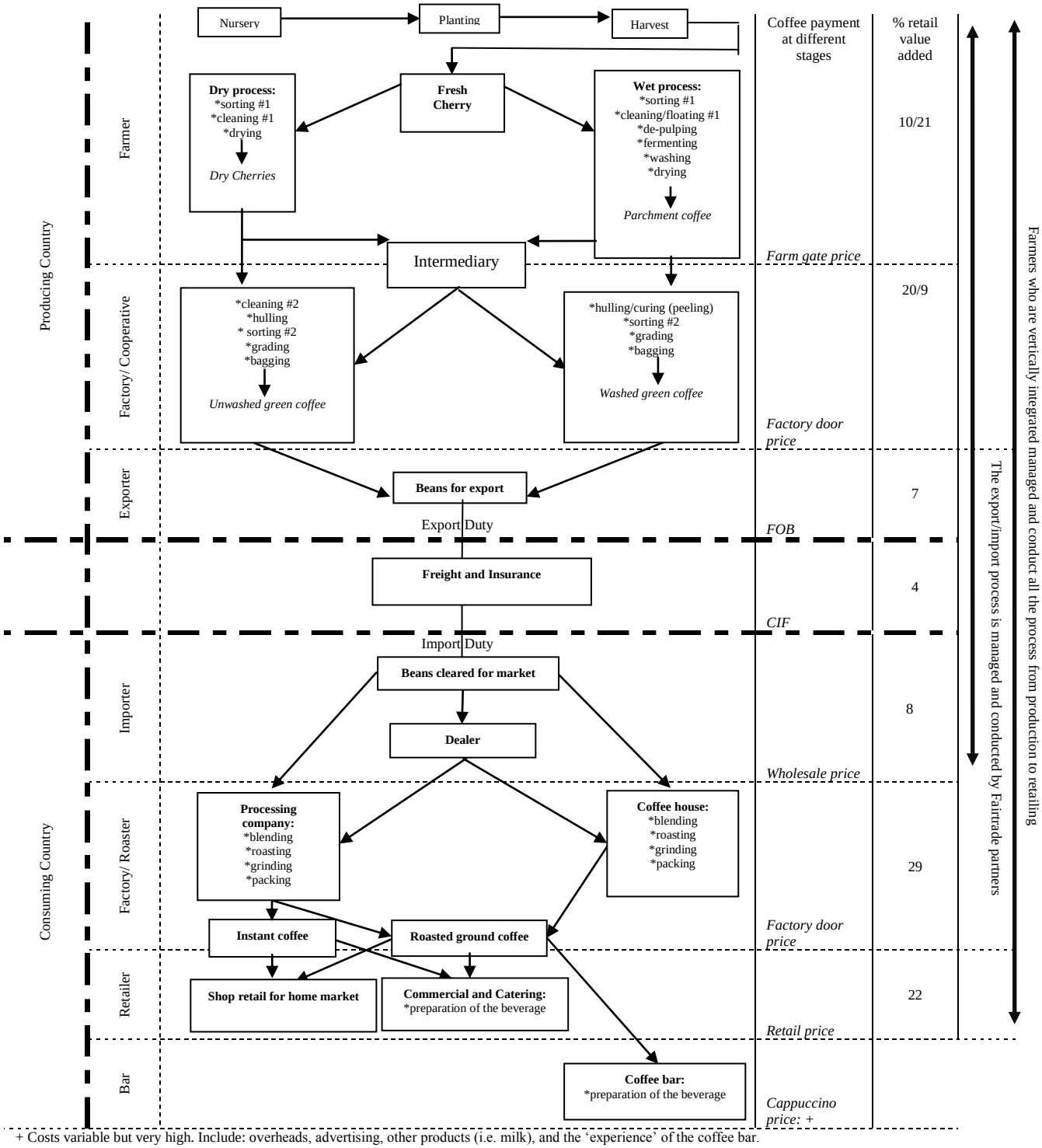
needs" of consumers (Tuvhag 2008; Ponte 2002).

The Input-Output Approach

The input-output approach refers to "a set of products and services linked together in a sequence of value-adding economic activities" (Gereffi and Korzeniewicz 1994). Fitter and Kaplinsky (2001), and Daviron and Ponte (2005) illustrate the input-output relation in the coffee value chain by presenting the process through which coffee passes to reach the final consumer (see figure 1.4).

At the beginning of the coffee value chain is the fresh coffee cherry, which, at this early stage, can be differentiated by variety, altitude, and type of soil (Tuvhag 2008). Coffee trees are first planted and raised in nurseries, where they stay for a year before being transplanted into the coffee plantation. Once coffee cherries are ripe, they are harvested through strip or selective harvesting methods. In strip harvest, both ripe and unripe coffee cherries are picked at once by hand or machine. Selective harvest, on the other hand, is a labor intensive method where only ripe cherries are harvested manually. Coffee cherries are then processed using either the dry or wet methods.

With the dry method the entire coffee cherry is dried. Almost all Robusta coffee, as well as high proportions of Arabica coffee in Brazil, Ethiopia, Haiti, Paraguay, India and Ecuador is processed using the dry method (ICO 2012a). The dry method requires little machinery as harvested cherries are sorted and cleaned with human labor. In the sorting process, unripe, overripe, undeveloped, damaged cherries, dirt, twigs and leaves are removed leaving only the ripe cherries. The selected cherries are spread out on patios to dry, resulting in *dry cherries*.



+ Costs variable but very high. Include: overheads, advertising, other products (i.e. milk), and the 'experience' of the coffee bar. (see breakdown of the price of a cup of coffee)

Source: Modified from Fitter and Kaplinsky (2001) & Daviron and Ponte (2005)

Figure 1.4 Coffee Value Chain[5]

[5] The FOB (free on board) is an export duty or fee paid for having green coffee sitting at the port

The wet method differs significantly from the dry method. Wet-processed coffee is characterized as being of better quality than dry-processed coffee. With the exception of the Arabica-producing countries noted above that use the dry method, the wet method is generally used for Arabica coffee. The wet method is considered to be more costly than the dry method because it "requires the use of specific machinery/equipment and substantial quantities of water" (ICO 2012a). Cherries are cleaned and sorted in tanks filled with flowing water. They are then de-pulped by a machine that pushes the cherries against a screen with holes so that only ripe cherries can break and release the coffee beans passing through the holes. It is important to de-pulp the cleaned and sorted cherries shortly after harvest to avoid deterioration and thus acquire a better quality coffee (ICO 2012a). Once the cherries are de-pulped, they go through a floatation process that not only separate de-pulped from un-pulped, imperfectly de-pulped cherries, and other unwanted material that might remain, but also controls fermentation, which generally takes from sixteen to thirty-six hours (ICO 2012a). The separated, fermented and de-pulped beans are then washed with clean water in either tanks or special washing machines. Finally, the beans are dried under the sun, resulting in *parchment coffee* (ICO 2012a).

For both the wet and dry methods, the drying process generally takes up to 4 weeks depending on weather variability. Large and some small-scale farms often use machine-drying to accelerate the process once the cherries have been pre-dried in the sun for several days (ICO 2012a). Small-scale farmers who do not have access to drying machines, and who live in rainy areas struggle because (a) coffee beans must have optimal moisture content of 12.5%, and (b) the drying task determines the quality and consequently the price of green coffee. If the coffee beans

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of export. The CIF (unit value of imports) is an import fee.

are over-dried, they can break easily and are considered defective. If they are under-dried, the moisture can create bacteria causing the beans to deteriorate (ICO 2012a).

After cherries (and parchment coffee) are dried, they are sent to local factories (cooperatives/curing plants) to be processed. The cherries (and parchment coffee) are first put through a hulling machine that removes the outer layers of the dried cherry (and parchment skin). Then they are machined-sorted by size and density and hand-sorted by color. The last step involves grading or categorizing the coffee based on size, altitude grown, processing method, taste, number of imperfections, and origin. The final product at the local factory-cooperative level, the unwashed green coffee (and washed green coffee), is then bagged in 60-kg bags and ready for export.

The traditional coffee value chain reflects a bilateral relationship between producing and consuming countries where the production of coffee takes place in developing countries, while the roasting, commercialization and consumption is done in northern developed nations (Tuvhag 2008). It is the latter set of activities where most of the value is added to coffee. This disproportionate income share between producing and consuming nations, specifically the low percentage of retained income for farmers in comparison to the retail price of coffee, led many producers in developing countries to integrate downstream into more advanced stages in the coffee value chain to capture a larger income share for their coffee sales. Alternative trading systems, such as fair trade and complete vertical integration, are two of the paths that small-scale farmers have taken in an "attempt to escape from their roles as suppliers of commodities in raw or semi-processed forms, which are subject to declining terms of trade, and move into more advanced processing stages of the chains" (Talbot 2002, p. 702). The question remains, however, whether having control of more advanced processing stages in the coffee value chain translates

into higher economic welfare and thus better living conditions for small-scale coffee farmers.

The present study will explore this question by comparing and contrasting three different coffee trading models or regimes currently functioning in Chiapas, Mexico: the conventional, fair trade, and vertically integrated models. The primary objective is to test the hypothesis that the small-scale coffee farmers who are vertically integrated from production to retailing are better off than farmers in the fair trade and conventional coffee trading regimes. In addition, farmers in the fair trade regime are expected to be in a more advantageous position than non-affiliated conventional farmers.

The paper is organized as follows. The next chapter provides a historical and organizational overview of the fair trade network, and fair trade coffee. Chapter three uses the theories of market power and transaction costs to explain why firms vertically integrate. Chapter four describes the data sources, data generating process, the methodological approach used to conduct the study. Chapter five presents the case studies (e.g. conventional, fair trade and vertically integrated models), utilizing the descriptive statistics to highlight the differences and similarities between them. In addition, this chapter also presents the qualitative analysis in which organized coffee farmers (e.g. fair trade and vertically integrated farmers) evaluate their coffee trading model, as well as the trading model of non-aligned independent farmers (e.g. conventional farmers). Non-aligned farmers, in turn, evaluate the conventional trading system and the cooperative trading system. Chapter six presents the empirical model and econometric results. The final chapter summarizes the main findings and conclusion while providing recommendations for further research.

Chapter Two: An Evaluation of the Fair Trade System

The General Fair Trade Movement

The Emergence of the Fair Trade Network

During the 1940s, religious and social groups in Europe and North America paved the way for the fair trade movement as they created alternative trading links between coffee producers and consumers in primarily the northern hemisphere. The first fair trade relationship was established by faith-based groups and international relief agencies that sold handicrafts from recovering war-ravaged communities in Europe to support Second World War refugees (Raynolds, Murray and Wilkinson 2007). By the 1960s and 1970s, these efforts evolved into a number of alternative trading organizations (ATOs) that sold handicrafts and agricultural products like honey, tea, cocoa and coffee, and (more recently) sports balls from southern hemisphere producers at prices above the market level (Raynolds, Murray and Wilkinson 2007; Lyon 2011; Fridell 2007). The fair trade industry is composed of a network of (1) producer organizations in southern countries, (2) buying organizations or ATOs in northern countries (e.g. importers, wholesalers and retailers), (3) umbrella bodies, and (4) conventional organizations like supermarkets (Moore 2004). Umbrella bodies or associations such as the International Fair Trade Association (IFTA), Network of European World Shops (NEWS!) and the Fair Trade Labelling Organization International (FLO) promote fair trade products and set fair trade standards to certify products.

Fridell (2007, p. 23) coined the term "Fair Trade Network" (hereafter FTN) for the "formal network of [ATOs] that connect peasants, workers, and craftspeople in the South with partners in the North through a system of fair trade rules and principles." The history of the FTN can be divided into two stages. In the first stage, from the 1940s to 1980s, the FTN's objective was to promote an alternative trading system, differentiated from conventional markets, by

emphasizing producer rather than consumer needs. During the second stage, from the late 1980s to the present, the FTN diverted its focus from alternative markets and began to enter conventional markets aggressively.

Alternative Trading Markets (1940s-1980s)

From the 1940s to the early 1980s, the FTN challenged the historically unequal south-north trading relationship and promoted an alternative trading system based on producer empowerment and poverty alleviation (Fridell 2004). FTN participants advocated for "trade, not aid" and demanded the elimination of unfair protectionist regulations and excessive agricultural subsidies used in northern nations. The FTN was committed to alternative international trading networks with strong market regulation. The FTN's focus on alternative markets was supported by the promotion of economic development projects in southern countries and the academic discourse at that time.

During most of the Cold War between the Soviet Union and the United States, a series of development projects in low-income nations were implemented as a strategy of northern nations to gain indirect control over the newly independent and unaligned countries. The development agenda promoted the regulation of international markets and strong state intervention to protect southern nations from the variability of the international market and the "unchecked power of the rich nations and giant corporations in the north" (Fridell 2004, p. 421). At the same time, the FTN was influenced by Latin American structuralist, dependency and world system theorists who asserted that the unequal economic exchange and flow of resources from poor and underdeveloped peripheral nations to wealthy core ones caused the "development of underdevelopment" in the global south and emphasized the need to develop an entirely new international economic order (Gunder Frank 1969; Fridell 2007). These theorists were crucial in

pursing southern governments to implement policies based on economic nationalism, self-reliance and autonomous development (Fridell 2004). Taken together, development initiatives and increasing counterhegemonic academic discourse encouraged the promotion of alternative markets that would enhance equity, justice and sustainability in producing nations.

Although the FTN was steadily increasing from the 1950s to the 1980s, the fair trade market remained too small to deliver the income southern producers required to survive (Fridell 2007). Focusing on alternative markets, in this sense, limited the growth of the FTN because these alternative networks had insufficient funding, inadequate marketing strategies and implementation, and there were negative perceptions on the part of buyers with regard to the quality of fair trade products. The insufficient funding prevented the FTN from hiring trained professionals who could effectively increase the profit margins because the FTN staff during this period was based on voluntarism (Fridell 2004). Additionally, the FTN's strategy to focus on producers' rather than consumers' demands led some importers or ATOs to incur losses in their fair trade business.

Restructured Conventional Markets (1980s-present)

After the late 1980s, the FTN transitioned from alternative trading systems to conventional markets in order to enhance their ability to meet the economic needs of southern producers (Fridell 2007; Raynolds, Murray and Wilkinson 2007). Entering mainstream markets accelerated the growth of the FTN. The rapid growth of the FTN after the late 1980s was supported by the increasing free market (e.g. neoliberal) reforms that were emerging worldwide and the nascent fair trade labelling initiatives.

Since the 1980s there has been a rise of free market ideology and the implementation of trade enhancing economic policies as "states and international financial organizations turned

away from policies of government intervention and market regulation" (Fridell 2004, p. 416). The International Monetary Fund (IMF) and World Bank became the primary vehicles advocating for neoliberal economic policies, forcing the deregulation of national economies via structural adjustment polices (SAPs)[6]. The collapse of the Soviet Union in 1991 and the creation of the World Trade Organization (WTO) in 1995 also promoted deregulation, liberalization, and freer trade economic policies (Raynolds, Murray and Wilkinson 2007).

Additionally, the establishment of fair trade certification bodies accelerated the FTN's entrance into mainstream markets. The Max Havelaar was the first fair trade labelling initiative, which was established in 1988 when a Mexican coffee cooperative requested to enter the "real market" for coffee in Europe. A number of labelling initiatives (e.g. Transfair USA, Fair Trade Foundation, etc.) also pursued certifying and labeling of fair trade products to sell in mainstream retail outlets, rather than through direct marketing. The fair trade Labelling Organization International (FLO) was formed in 1997 with the main objective to gain participation of conventional importers, processors and distributors by offering mainstream companies access to an "ethical market" through the fair trade label (Fridell 2007; Raynolds, Murray and Wilkinson 2007)[7]. Although FLO is the largest and most widely recognized certification body, other labelling initiatives that certify sustainable coffees include organic certification, Utz-certified and

[6]SAPs are policies imposed on indebted southern nations to be eligible for new IMF/World Bank loans. These policies include reducing government public spending, downsizing the state, de-regulating, cutting tariffs, quotas and other restrictions on imports, relaxing corporate taxes, cutting wages, devaluing the local currency, privatizing state assets, and becoming an export-reoriented economy.

[7] The FLO is composed of an umbrella of 25 members around the world who produce or promote the fair trade Certification Mark. FLO members include three producer networks (Fair Trade Africa, Coordinator of Fair Trade Latin America and the Caribbean, and Network of Asian Producers), nineteen labelling initiatives covering 24 countries, two marketing organizations (The Czech Fair Trade Association and Europe Korea Foundation) and one associate member (Comercio Justo Mexico) (FLO 2012).

Rainforest Alliance. In the coffee industry, organic and fair trade (FLO) certifications are the most important categories with 1.69 and 1.53 million bags of certified coffee in 2009, respectively (see figure B.1).

The Current Fair Trade Industry

In 2010, the top ten fair trade producing countries accounted for sixty-six percent of the total EUR€5.5 billion fair trade sales. With EUR€81.9 million, Peru occupied the first place in fair trade sales revenues, followed by the Dominican Republic, Colombia, Kenya and Ghana (see table 2.1). On the demand side, consumers in 2010 spent EUR€4.36 billion on fair trade products worldwide, a twenty-seven percent increase since 2009 (FLO 2011e). The top ten consuming countries accounted for eighty-nine percent of the total retail sales. The United Kingdom (UK) was the largest consumer of fair trade products with EUR€1.34 billion, followed by the United States, Germany, France and Canada.

Table 2.1 Top Ten Countries in Sales Income and Retail Sales of Fair Trade Products, 2010 (EUR€ millions)

Reported sales income		Estimated retail sales	
Peru	81.9	UK	1344.0
Dominican Republic	60.9	USA	937.0
Colombia	44.3	Germany	340.0
Kenya	39.7	France	303.3
Ghana	26.6	Canada	248.8
Nicaragua	25.5	Switzerland	219.9
Mexico	25.1	Ireland	138.0
Ecuador	22.4	AUS/NZ	125.9
Guatemala	17.9	Netherlands	119.0
Honduras	17.5	Sweden	108.5
Total	550	Total	4361

Source: FLO (2011e and 2011f)

Representing a twenty-two percent increase since 2008, fair trade producer organizations received a total of EUR€51.5 million in fair trade premium income in 2009-2010, from which seventy-four percent went to small-scale cooperatives and twenty-six percent hired labor

organizations (HLOs) (FLO 2011e). HLOs are large organizations that hire labor to perform farm work throughout the year. Latin America and the Caribbean received the largest amount of fair trade premium with a total of EUR€34,135,000, followed by Africa (EUR€13,742,000), and Asia and Oceania (EUR€3,437,000). Accounting for almost sixty percent of the total fair trade premium, Peru, Kenya, Dominican Republic, Colombia, Belize, Ghana and Mexico are the top seven countries receiving fair trade premiums in 2009-10.

Fair Trade Coffee

Although fair trade products include non-agricultural products such as sports balls, agricultural commodities are the most common products with coffee, bananas and cocoa representing seventy-four percent of the total fair trade sales in 2009-10 (FLO 2011e). With forty-four percent of all sales value, coffee is the most sold fair trade product. In 2009–10, fair trade coffee sales represented thirty percent of total certifiable production. Small-scale farmers in Latin America produced more than eighty percent of all fair trade certifiable coffee, with Colombia, Peru, Brazil, Guatemala and Costa Rica having the largest production capacity. Together, the top ten countries with the highest fair trade certifiable coffee production capacity account for ninety-three percent worldwide (see table 2.2).

Table 2.2 Top Ten Countries: Fair Trade Certifiable Coffee Production Capacity, 2009-10 (MT)

Colombia	94,400
Peru	68,300
Brazil	24,800
Guatemala	23,700
Costa Rica	21,300
Indonesia	20,700
Nicaragua	17,200
Mexico	14,800
Tanzania	11,600
Honduras	10,500
Total	333,000

Source: FLO (2011e)

Of the total fair trade certifiable production, thirty percent (105,000 metric tons) was also organic certifiable. In 2009-2010, Peru, Indonesia, Mexico, Nicaragua and Honduras were the top five producers of fair trade organic certifiable coffee, accounting for seventy-five percent of the total. The high percentage of dual certification reflects the large remuneration in premiums that accrue with a combined certification for organic fair trade coffee.

Between the 2008/09 and 2009/10 crop years sales volume of fair trade coffee grew by six percent to 103,000 metric tons, while sales value had a sixteen percent increase reaching EUR€242 million. The high fair trade coffee sales values reflect the strong market prices present in the 2010 calendar year. In 2009/10, the total fair trade premium for coffee reached EUR€17 million, representing a thirty percent increase since 2008. The increase in fair trade premium reflects the overall coffee premium increase in 2008 from USD$1.26 to USD$1.40.

FLO Standards—Small-Scale Producer Cooperatives

Small-scale farmers in the FTN are required to be organized into producer organizations, often cooperatives. In contrast to HLOs, which are large organizations that rely on hired labor to run the farm throughout the year, small-scale cooperatives are those that mostly use family members to do the farm work year round (FLO 2011b; FLO 2011e). Small-scale cooperatives in the FTN must comply with the FLO standards, which require cooperatives to (1) have agricultural and environmental practices that are safe and sustainable, (2) conform to the conventions of the International Labor Organization (ILO), and (3) have democratic structures and transparent administrations in place to ensure the direct benefit of farmers (FLO 2011b). There is a different set of standards for HLOs, but because over ninety percent of fair trade coffee is produced by small-scale cooperatives, HLO standards will not be discussed in detail in this paper.

Environmental protection

Small-scale cooperatives in the FTN must encourage the reduction of pesticide and herbicide use by providing training on integrated pest management (IPM) and alternative weed prevention and control strategies. IPM is an environmentally sensitive approach to pest management that relies on a combination of "common-sense" practices including the use of alternative ways to control pest and diseases (e.g. introducing natural enemies), prevent pests and diseases (e.g. crop rotation), and mitigate the buildup resistance of pest and diseases. In addition, cooperatives must provide the proper equipment and training on the use of hazardous chemicals and proper storage to reduce the risk on humans and animals and natural resources (e.g. water, soil). Fair trade cooperatives are also required to offer training on the effective use of water and waste water management. Buffer zones are to be kept around protected areas and bodies of water when handling waste water, pesticides and herbicides to ensure the sustainability and survivability of the habitat and biodiversity. Reusing organic waste through practices that recycle nutrients are encouraged (FLO 2011b).

Labor Protection

Fair trade cooperatives must follow the ILO's rules to protect their workers. Under ILO standards, all workers are considered to be wage labor regardless if they are permanent or temporary, migrant or local, subcontracted or directly employed. Workers include all hired labor independent of their working site (e.g. field, processing facilities, and administration). Senior managers and other professionals are not considered workers (FLO 2011d). ILO rules require fair trade cooperatives to prohibit worker discrimination, sexual harassment, forced labor, child labor and corporal punishment (e.g. physical, mental, and verbal abuse). The ILO refers to discrimination as the act of treating workers differently based on workers' race, color, sex, sexual orientation, disability, marital status, age, religion, and political opinion among other

activities. Child labor is considered any working children under the age of 15 and young adults under 18 years of age who are exposed to health risk activities and exploitable conditions (FLO 2011b). Under ILO standards cooperatives are also encouraged to provide maternity leave, health insurance, and to pay their workers minimum wage or the relevant industry average wage (if higher than minimum wage) and gradually increase their salary. In addition, fair trade cooperatives must allow and encourage the rights to freedom of association, collective bargaining and to join independent trade unions (FLO 2011d).

Democratic and Transparent Structures

The structure of the cooperatives must foster democracy and transparency to enhance the benefits farmers and workers receive. Fair trade producer cooperatives must have a General Assembly, a board of directors and elected delegates, and all its members must be eligible for service in these positions. The fair trade Development Plan and fair trade price premium are to be designed and used, respectively, under democratic and transparent conditions. The fair trade Development Plan is a document that promotes sustainable production practices, and the development of the fair trade business, organization, members, workers, community and environment (FLO 2011b). All major decisions are to be made at the annual General Assembly, in which annual reports, budgets and accounts are to be approved. In addition, the cooperative must identify disadvantageous and/or minority groups within the organization and create programs to improve their social and economic position (FLO 2011b).

Fair Trade Principles for Small-Scale Coffee Cooperatives

Fair trade minimum price

The fair trade minimum price was set to protect producers from market instabilities by offering a safety net when market prices are low. The fair trade minimum price intends to cover the cost of

sustainable production (COSP) for all producers. The COSP include the costs of establishing coffee production, field operations, harvest and post-harvest, transformation and processing, product preparation and packaging, central structure (e.g. application and initial certification fees), and export costs (FLO 2010). For HOLs, the fair trade minimum price intends to cover minimum or local wages (whichever is higher) and provide decent working conditions for workers (Nicholls and Opal 2005).

Nelson and Pound (2009) analyzed twenty-three reports, containing thirty-three different case studies written on the impact fair trade certified commodities have on producers. The thirty-three case studies covered fair trade products like coffee, cocoa, bananas, and fresh fruit with coffee accounting for seventy-six percent of all case studies. Seventy-nine percent of all studies took place in Latin America and the Caribbean. Most of the studies are for small-scale cooperatives with only two studies for HLOs. The results suggest that the fair trade minimum price improved producer income stability and served as a buffer, particularly when market prices were below the costs of production. Currently, the minimum FOB price for fair trade coffee is fixed at USD$1.40 per pound for Arabica washed coffee. An additional 30 cents is paid for organic-certified coffee, regardless of the processing method used (see table 2.3).

Table 2.3 Fair trade minimum price, 2012

Method	Arabica	Robusta
Conventional, natural	$1.35	$1.01
Organic, natural	$0.30	$0.30
Conventional, washed	$1.40	$1.05
Organic, washed	$0.30	$0.30

source: FLO (2012)

When market prices are higher than the fair trade minimum price, producer organizations are paid the market price, plus the fair trade premium (which will be discussed in the next section), plus the organic differential. In other words, the fair trade price is indexed so that it rises if the

market price rises, meaning that the fair trade price is always above the market price by the amount of the fair trade premium (and organic differential). Therefore, the fair trade price works as a price floor. Economists criticize the use of a price floor because it creates a loss in consumer and producer surplus by deviating from market equilibrium, thereby creating market inefficiencies (see figure 2.1).

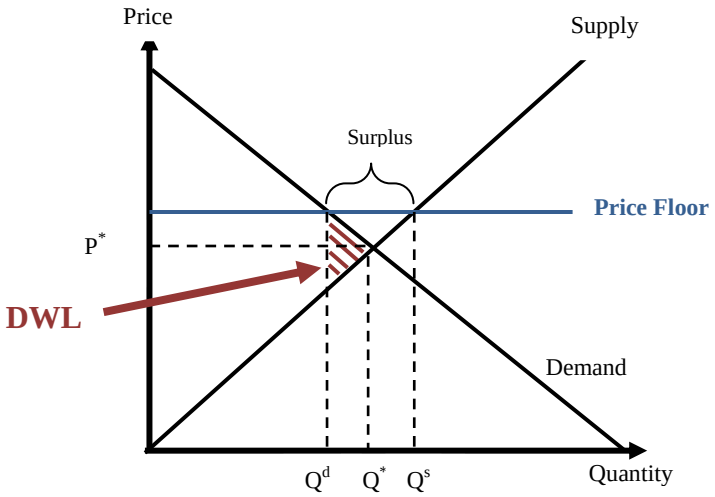


Figure 2.1 The Economics of a Price Floor

In general, an imposed price floor above the market price would incite producers (or suppliers) to supply more than the equilibrium quantity (Q^*) and up to the point where their marginal cost equals the price floor (Q^s). The consumers (or buyers) will, however, demand less quantity (Q^d) because of the higher price. This means that the quantity supplied (or produced) exceeds the quantity demanded (or consumed), creating a surplus of Q^s minus Q^d and a deadweight loss (DWL) shown in the lined triangle. In other words, "welfare losses arise as producers are tempted to produce although their marginal costs may exceed the market equilibrium and therefore the marginal utility for consumers" (Mann 2008, p. 2035). Commonly, price floors are set by governments, which, in case of a surplus, try to equilibrate demand and supply by taking

the surplus out of the market by storing the surplus or "dumping" it in the market (Henderson 2008). In the case of fair trade coffee, however, the minimum price is set by private fair trade organizations that do not buy the excess supply of coffee (Henderson 2008). Instead the surplus is sold at the conventional market price, driving the overall market price down. If the surplus is large enough it can reduce the price below the market equilibrium price, and directly affect non-fair trade producers.

Despite the fact that a compulsory price floor can, theoretically, create an excess supply, the low percentage of fair trade coffee with respect to the total coffee market decreases this probability (Nicholls and Opal 2005). It is estimated that only one or two percent of the global fair trade coffee production capacity is sold at fair trade prices (Lewin, Giovannucci and Varangis 2004; Giovannucci 2001). In 2010, fair trade coffee producers had a productive capacity of 330,000 metric tons for a demand of 103,000 metric tons, meaning that sixty-nine percent of the production of fair trade certified coffee was not sold as a fair trade product (FLO 2011e).

Some scholars point out that, in addition to creating a coffee surplus, the fair trade price (always being above market prices) excludes the most marginalized coffee farmers (Weber 2007; Mann 2008). The higher remuneration for fair trade coffee, compared to conventional coffee, encourages producer cooperatives to enter the fair trade market. The existing excess supply of fair trade coffee, however, drives fair trade certification bodies to increase entry barriers. The FLO, the most important labelling institution, is a very selective fair trade certification body. In order for new cooperatives to be registered by the FLO, they must identify a new importer who demands their products and supports their request for registration (Mann 2008).

Producer organizations also need to have funds to buy coffee from their members and, in

some cases, cover export costs. In general, about $15,000 in financing is needed to export one container of fair trade coffee (Weber 2007). The fair trade certification fee of $3,200 and additional fees (e.g. organic certification), are costs that young and/or marginalized cooperatives are often times unable to meet. Increased barriers to entry have made it increasingly difficult for many small-scale producers, the same producers that the FTN targets, to participate in the fair trade market (Weber 2007).

Tedeschi and Carlson (2011) argue that models that conclude that fair trade is inefficient due to its 'subsidy' nature fail to represent fair trade because they (1) overlook other principles besides the minimum price in the fair trade systems, and (2) assume that commodity markets in developing countries are perfectly competitive. According to these scholars, it is clear that fair trade positively influences coffee farmers' economic welfare when market failures in the coffee value chain are taken into account and the credit aspect of fair trade models is more fully explored.

Price premium

Aside from the fair trade minimum price, fair trade standards require traders to pay a fair trade premium of USD$0.20 per pound. The fair trade premium is extra income added regardless of product differentiation (e.g. organic). The FLO requires at least USD$0.05 per pound to be invested—at the individual or cooperative level—in the improvement of productivity and/or quality of fair trade coffee. Productivity and quality investments refer to any measure that will increase the quantity and quality of coffee produced. Measures to improve productivity (e.g. yields) include training on agricultural practices, farm-level replanting and renewal projects, purchasing of equipment or infrastructure investments. Investments in quality improvement, on the other hand, include hiring cuppers, building cupping labs, and providing members with

cupping training (FLO 2011c)[8].

While small-scale cooperatives are required to spend the fair trade premium on projects that improve their business and community, HLOs must use the premium on activities that are *not* the responsibility of the plantation management. Instead of investing in business, production and processing development, which are the responsibility of the plantation management, HLOs must use the fair trade premium for the socio-economic development of their workers and the workers' communities by investing on worker capacity building and career development (FLO 2011e). The cooperative's General Assembly chooses the investment projects where the fair trade premium is to be spent. The certification body (e.g. the FLO) inspects the projects to guarantee their design is democratic and transparent, and that they directly benefit the community (FLO 2012). In a HLO, worker representatives (or the Joint Body) democratically decide how to use the fair trade premium.

Previous studies show that most small-scale coffee cooperatives use the fair trade premium to improve their communities, education, environment, health, gender equity, as well as to invest in business, production and processing development. As illustrated in table 2.4, small-scale coffee cooperatives spent large proportions of the fair trade premium to improve their business by investing at both the farm and cooperative levels.

[8] Coffee cupping refers to the practice of an individual or a team subjectively measuring aspects of coffee's taste, body, and aroma by sipping coffee.

Table 2.4 Small-Scale Coffee Cooperative Uses of Fair Trade Premium by Category, 2009/10

Category	Description	%
Community	Community development projects, infrastructure, credit schemes, disaster relief, and support for community institutions (e.g. children's homes or social charities)	4
Education	School infrastructure, school supplies, scholarships, payment of school fees, teacher training, and adult education	2
Environment	Environmental development projects, organic certification, and environmental and waste management projects	2
Health	Clinics, health insurance, medical supplies, health training, and sanitation	1
Gender equity	Programs and projects focusing on women's needs such as women's income generation projects, training and development, and women's health	0
Investment in business development	Investment in the development and strengthening of farmers' organizations through business training for organization employees and management, development of internal control systems and quality management, and development of organizational infrastructure (e.g. warehouse and storage facilities, quality checking facilities, export and packing facilities)	**30**
Investment in production and processing	Inputs, equipment, and training directed at farm level to support increased yield, quality, or diversification	**28**
Other premium uses	Cash payments and other forms of direct financial or social support for members or workers within the organization, financial investment and capitalization for the producer organization, and other uses not fitting into the above categories	**29**
Not known	Premium spent on uses that were not reported	4

Source: FLO (2011e)

Small-scale coffee farmers spent thirty percent of the fair trade premium for the development and strengthening of the cooperative as a business. Twenty-eight percent of the premium was spent on production and processing investments to increase coffee productivity and quality. The purpose of these investments was to make the cooperative a more sustainable business that could effectively compete on quality and productivity (FLO 2011e). In addition, twenty-nine percent of the fair trade premium was spent on making payments directly to members to ensure their commitment to the cooperative when commodity prices are high and thus secure a stable product supply.

Pre-financing

As a core principle of the FTN, fair trade importers are required to provide, upon request, up to sixty percent of the contract amount in pre-financing to producers (FLO 2011c). Pre-financing refers to payments made to producer organizations to finance their purchases from members. These payments usually accrue interest, which must not exceed the buyer's current cost of borrowing, including any administrative costs (FLO 2011c). According to the FLO requirements, buyers must provide the pre-financing as soon as the contract is signed to make sure that producers can effectively and rapidly use the money. In the case of coffee, pre-financing must be made available at least eight weeks prior to shipment. If multiple shipments are planned, the pre-finance can be spread throughout the shipments (FLO 2011b). The fair trade importers, however, are not required to pre-finance producers who have been categorized by a third party as high risk. High-risk producers are those who have failed to repay loans or deliver the agreed products in the past. In other words, in order for producers to be pre-financed they must be credit-and-trustworthy. At the same time, fair trade producers are encouraged to document complaints to the certification body when pre-financing is not made available to them. Anecdotal evidence suggests that producer cooperatives rarely ask for pre-financing or file complaints because they fear the buyer will go to a less-demanding cooperative.

Sustainable and direct trading partnership

Importers using FLO labels are required to purchase green coffee directly from cooperatives and establish contracts that extend beyond one harvest cycle (Raynolds 2002)[9]. Based on mutual respect, transparency and commitment, these long-term relationships allow producers to have a consistent income and increases information flows between producing and consuming nations

[9] Fair trade cooperatives must export their coffee in its primary form (e.g. green bean) because buyers (e.g. fair trade importers) want to (1) sell fresh coffee (e.g. coffee losses freshness after roasting) and (2) acquired some of the value-added in more advance stages of the value chain.

(FLO 2011). Despite the fact that most fair trade standards require contracts of at least six months, these long-term relationships are not respected when dealing with mainstream stakeholders because of their low commitment to these 'sustainable' concepts. In fact, Pierre (2007) shows that mainstream markets joined the fair trade movement not because they were committed to increasing the income share of producers, but because they wanted to "clean-wash" their reputation as sustainable markets. Given this lack of commitment and the large number of cooperatives eager to sell their coffee, many buyers switched to other cooperatives—immediately after their contract expired if they encountered any problem (e.g. limited/unstable coffee supply)—instead of providing support to improve the cooperative's supply structure.

Chapter Three: Vertical Integration

Vertical integration was first used in the field of industrial organization during the post Second World War period. Influenced by neoclassical economics, vertical integration was concerned with different types of hierarchical organizations and their reliance on anonymous spot markets to allocate their resources. Firms were described as a production function that "defined the technologically most efficient opportunities to transform inputs into outputs" (Joskow 2006, p. 4). Factors that determined the existence of firms, their boundaries relative to the market, and their internal organization were largely ignored. Although pioneering work was done early by Frank Knight (1921) and Ronald Coase (1937), it was not until the mid-1970s that work that addressed firms (and markets) as governance structures emerged (Joskow 2006; McFetridge 1994).

The theory of vertical integration is multifaceted, and it is located at the intersection of theory of the firm, theory of contracts, and theory of markets (Perry 1989). A firm is said to be vertically integrated when it expands into two or more stages in the production path or value chain. There are two types of vertical integration: upstream (or backward) integration, which occurs when a firm decides to make instead of buy an input from an independent supplier or seller, and downstream (or forward) integration where a firm uses rather than sells one of its products to independent buyers (McFetridge 1994).

The theory of vertical integration has been analyzed through two different but complementary approaches. The first is the market failure approach which focuses on the effect of alternative pricing arrangements on input and output combinations. In the market failure approach, the costs of internal organization are not recognized. This approach only identifies the costs incurred through distortions in market prices, quantities, or the factor proportions used to

produce output from a neoclassical production function (Joskow 2006). The second, the transaction costs approach is concerned with how vertical transactions are organized, particularly focusing on the measurement, enforcement and bargaining costs of these transactions (McFetridge 1994; Joskow 2006). Both approaches intend to predict whether the decision to make internally or buy through the market is more profitable. It should be noted, however, that there is a range of "hybrid forms" of contractual arrangements (e.g. vertical restraints) that lie between simple spot market transactions and internal organization, including long term contracts, franchise contracts, non-linear pricing arrangements, resale price maintenance agreements, requirements contracts, joint ventures, dual sourcing (partial vertical integration) and others (Joskow 2006, p. 2).

Market Failure Approach

The market failure approach (hereafter MFA) examines the responses of firms to market power at one or more levels of the vertical chain, and the firms' efforts to mitigate or enhance this market power (Joskow 2006). Under MFA, firms use vertical integration (or contractual vertical restraints) as a response to pre-existing market power problems or as a strategy to create or enhance market power in upstream or downstream markets.

The *double margin problem* (or vertical externality) is a classical explanation for vertical integration, where it is assumed that there are two monopolies, an upstream ("producer") and a downstream ("retailer") that exercise their market power. It is further assumed that the producer has all the bargaining power, and that both the producer and retailer face constant marginal costs. The downstream retailer demands D_1 from the upstream producer, who, in turn, generates marginal revenue of MR_1. The final market demand is D_2 with marginal revenue of MR_2. In the absence of vertical integration (or contractual vertical constraints), the producer will maximize

profits by equating its marginal income and marginal costs ($MR_1 = MC_1$) and charging the retailer a monopoly input price P_1. The retailer takes P_1 as its input cost (MC_2) and exercises its monopoly power to maximize profits by charging a larger retail price $P_2 > P_1$. The resulting profits (Π) are $\Pi_1 = (P_1 - P_0) * Q_M$ for the producer, and $\Pi_2 = (P_2 - P_1) * Q_M$ for the retailer (see figure 3.1).

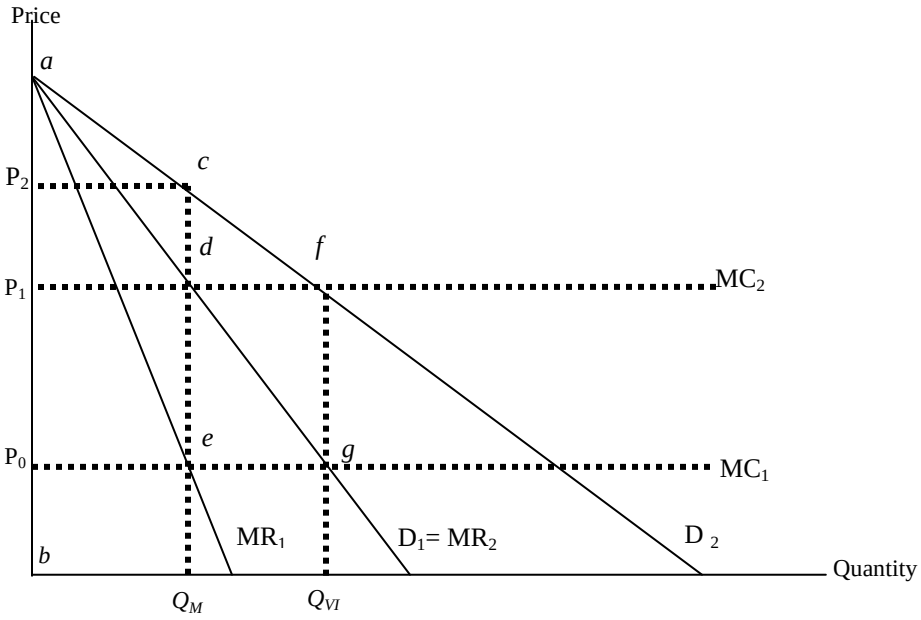


Figure 3.1 Double marginalization

When the firms act as independent monopolies the aggregate profits are smaller than they would be if they were vertically integrated. Assume that the upstream producer distributes its products itself, responding directly to demand D_2, obtaining marginal revenue MR_2, and facing a marginal cost MC_1. The producer will maximize its profits at $(P_1 - P_0) * Q_{VI}$, representing a larger profit than the sum of the profits of the producer and distributor together. The social welfare, represented by consumer surplus (CS) and producer surplus (PS), is also larger when firms are vertically integrated. When firms operate as independent monopolies, the total consumer and producer surpluses become CS_M=*a* P_2 *c* and PS_M=P_2 P_0 *e c* resulting in a social welfare of surface

area "*a* P_0 *e c*." By charging a lower price (P_1), a vertically integrated firm will generate a larger consumer surplus (CS_{VI}=*a* P_1 *f*) and producer surplus (PS_{VI}=P_1 P_0 *g f*), increasing the social welfare to the surface area of *a* P_0 *g f*. In fact, when the firms operate independently, a deadweight loss of *c e g f* is generated. In sum, double marginalization leads to higher prices for the final consumer (and thus lower consumer surplus), and lower aggregate profits for the producer and retailer monopolies than those faced under a vertically integrated monopoly.

When the assumption of one upstream producer and a downstream retailer does not hold and there are additional stages in the value chain of a product, as it is the case with coffee, the vertical market of the product exhibits multiple marginalization (as opposed to double marginalization). In fact, the more stages there are, the more severe the multiple marginalization problem can become, and the higher the final prices for the consumers will be assuming some level of market power (Vettas 2010). In addition, because in every stage of the vertical market value is added to the product (e.g. coffee), producers of the raw commodity who are at the upstream end of the value chain receive the smallest share of the final retail price. Upstream producers can solve this problem by vertically integrating into more advanced stages in the value chain. Contractual vertical restraints can also be utilized to obtain the same total profits as with vertical integration. Some contractual remedies could involve the use of any resale price ceilings, minimum quantity provisions or marginal costs pricing with franchise fees by the upstream monopoly (McFetridge 1994).

Another potential source of incentives for vertical integration is the *free rider problem* (or horizontal externality) that arises when upstream firms produce differentiated products that require various forms of downstream promotional efforts (Mathewson and Winter 1986; McFetridge 1994). Coffee, for example, can be differentiated at varying degrees including

product characteristics (variety, altitude, soil type, country of origin), processing techniques (dry or wet method, blend, roast), and cause related attributes (organic, fair trade, rainforest) among others. Downstream coffee firms (e.g. importers) must promote the differentiated coffee through advertising, point of sale information, post-sale service, and certification among others. The demand for upstream products (e.g. differentiated green coffee) is shaped by the downstream retail sales, services activities, and associated expenditures. Downstream retailers will under-invest or under-promote the product if they cannot fully appropriate the benefits of retail service expenditures. That is, if downstream retail competitors of the same brand or with the same product characteristics can free ride or benefit from the promotional efforts made by other retailers, these retailers will have an incentive to under-promote the product. The upstream producer can remedy this inefficiency by vertically integrating downstream into distribution or by using contract vertical restraints. Contractual devices include resale price maintenance and exclusive territories, which can lead to increases in social welfare for the upstream firm (Mathewson and Winter 1986).

A third example of vertical integration arises from *price discrimination*. Differences in the elasticity demand for intermediate goods allow the upstream monopoly to engage in third degree price discrimination by charging different prices to downstream firms with varying degrees of elasticity of demand. The upstream producer can charge higher prices to firms with inelastic demand and lower prices to firms with elastic demand. In the coffee industry, an organized coffee cooperative (e.g. upstream firm) sells the same coffee to fair trade and conventional buyers at different prices[10]. Because fair trade buyers have an inelastic demand for coffee, they are charged a higher price than conventional buyers. As previously mentioned, fair

[10] Although the coffee is differentiated when the fair trade level is attached, the physical characteristics of the coffee are the same.

trade buyers—known as ethical consumers—are willing to pay a price premium to support producers working to achieve a decent standard of living.

To effectively engage in third degree price discrimination, the upstream monopoly (e.g. coffee cooperative) must block downstream firms that pay lower prices (e.g. conventional coffee buyers) from reselling the intermediate good to firms with lower elasticity (e.g. fair trade buyers) that pay higher prices (Joskow 2006). Vertically integrating downstream with firms that have higher elasticity of demand effectively blocks the resale of intermediate goods. The vertically integrated firm can not only charge itself a lower price, but can also sell the intermediate good at higher prices to non-integrated firms with lower demand elasticity.

Given that the downstream firm cannot produce the intermediate goods more efficiently than the upstream integrated firm; the downstream firm will be unable to compete with the integrated firm due to the high price it must now pay for the intermediate good. Although downstream vertical integration and price discrimination will increase the profits of the upstream firm, the welfare effects are ambiguous. In addition, the upstream monopoly can accomplish the same price discrimination result by using contractual vertical restraints, such as signing a contract with downstream firms that can credibly restrict resale, making the downstream firms face the same industry-specific price for the input sold by the upstream monopoly (Joskow 2006).

Transaction Costs Approach

The transaction costs approach (hereafter TCA) moved beyond neoclassical economics and its description of the firm as a production function, and instead describes the firm and markets as governance structures (Williamson 1998). The TCA uses transactions instead of commodities (as with neoclassical economics) as the unit of analysis. In addition, rather than perceiving

efficiency in technology terms (e.g. economies of scale and scope), TCA draws efficiency from the ability of firms to mitigate transactions costs and various contractual hazards by choosing the organizational and contractual governance structures that can effectively reduce these costs (Williamson 1981; Williamson 1998; Joskow 2006). Transaction costs are the costs of "negotiating, writing, enforcing and breaking contracts" (Antinori and Gordon 2001). Under TCA, vertical integration occurs when the transaction costs of coordinating production through market exchange is greater than internalizing these costs by the firm (McFetridge 1994; Williamson 1981).

In addition, TCA identifies asset specificity as the most important condition for vertical integration. Asset specificity refers to specific investments that the transacting parties make in support of particular transactions. These specialized investments have a "lock in" effect because they are non-redeployable (or redeployable at a higher cost) and cannot be fully recovered if the transacting parties' relationship is terminated (Williamson 1981; McFetridge 1994). Williamson (1985) distinguishes four types of asset specificity. The first is *site specificity*. When the location of an asset in successive stages is in close proximity to both parties involved in the transaction, as to minimize costs of inventory and transportation, the asset is said to be site-specific. Site-specific assets are costly to relocate (e.g. they are immobile). The second is *physical asset specificity*, and refers to specialized physical assets, like machinery, that involve design characteristics specific to the transactions which have lower value in alternative uses. Since the machinery can be moved from one site to another, physical asset specificity does not necessary leads to internalization. Third is *human asset specificity*, which refers to the skills obtained in a learning-by-doing manner that are imperfectly transferable across employers. That is, workers who accumulate firm specific human capital that enables them to produce goods or services more

efficiently than other workers are considered asset specific. Lastly, *dedicated asset specificity* refers to general investments by a supplier that cannot be readily used for other purposes, and that would not otherwise be made but for the prospect of selling a large amount of product to a particular customer (Williamson 1981).

Figure 3.2 is a graphical representation of Williamson's model of production and governance cost differences that, given asset specificity (A), illustrate the optimal point for moving forward with vertical integration. The steady state production cost difference between internal organization (vertical integration) and market procurement as a function of asset specificity is represented by the curve $\Delta C = f(A)$, and the governance cost difference is represented as $\Delta G = f(A)$. The production cost for internal organization (ΔC) is large when transactions are non-specific or standard (e.g. A is low). Although the cost disadvantages decrease as the degree of asset specificity increase, market rather than firm procurement is preferable as outside suppliers are able to "aggregate the diverse demand of many buyers and produce at lower costs" (Williamson 1985, p.92). By the same token, internal organization is preferable when there are high levels of asset specificity.

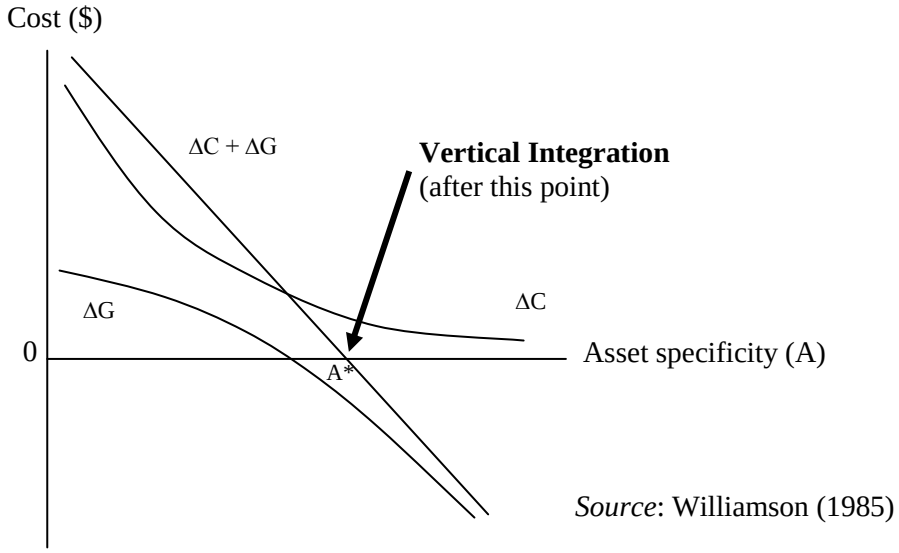


Figure 3.2 Comparative Production and Governance Costs

According to Williamson (1985), the decision to vertically integrate does not rests solely on production costs because a firm will never be able to produce the product at a lower cost than the market (e.g. ΔC is never zero). Instead, the decision to vertically integrate, given the specified level of asset specificity, depends on the *vertical sum* of the production cost and governance cost differences. If $\Delta C + \Delta G > 0$, firms do not vertically integrate because market procurement has advantages in economies of scale and governance, and thus market procurement will be better at providing this product or service. If $\Delta C + \Delta G = 0$, that is at point A*, firms are indifferent between governance structures. If $\Delta C + \Delta G < 0$, firms will vertically integrate because, with high levels of asset specificity, internal organization is more efficient. That is, vertical integration occurs at levels higher than A*. In other words, the higher the asset specificity (e.g. specialized investment) associated with the transaction, the more likely the firm will vertically integrate, *ceteris paribus* (McFetridge 1994).

Coffee is a commodity with asset specificity characteristics that have a "lock-in" effect on small-scale coffee farmers. Coffee is site specific (e.g. immobile) because it can only be grown in the tropical and subtropical regions of the globe. Cultivating coffee is an investment that takes from four to five years (for new trees) to reach optimal yields. However, the trees can be productive up to twenty-five years thereafter, making coffee a permanent crop (Muradian and Pelupessy 2005). It is difficult for small-scale coffee farmers to diversify to other crops because their limited income and savings makes them risk averse to the uncertainties of switching costs (Nicholls and Opal 2005). In addition, in many coffee growing regions, the production of coffee has been a practice passed down from father/mother to son/daughter generation after generation. Through this process, coffee farmers have gained human capital (e.g. human asset specificity) that is specific to coffee farming and it is non-transferable across farmers. This human capital

allows farmers to be more efficient in coffee farming than farmers without the experience (e.g. human capital).

In the conventional coffee value chain, coffee farmers sell to local intermediaries or middlemen at the farm-gate level. Intermediaries, representing market procurement, will always be more effective (e.g. have a lower transaction cost) when commercializing coffee in the market than coffee farmers. Because when coffee farmers sell to intermediaries they have no bargaining power and are exposed to fluctuating coffee prices (e.g. high governance costs), coffee farmers would opt for vertical integration to gain more control of their coffee in more advance stages of the coffee value chain and reduce governance costs.

In addition, coffee (and coffee transactions) are exposed to supply and demand uncertainties. Given that it is costly or/and impossible to anticipate all contingencies when transacting under uncertainty, firms will vertically integrate (Frank and Henderson 1992). Downstream firms, for example, run the risk of not receiving the agreed quality and quantity of coffee from producers upstream in a consistent, steady and timely manner. Upstream producers also run the risk of downstream exporters switching to other upstream suppliers if it is more profitable to do so. Firms vertically integrate to reduce these and other types of uncertainties by enhancing intrafirm information flows to coordinate a consistent (e.g. quality and quantity), steady, and on time coffee supply and to discourage opportunistic behavior (Hennessy 1996).

There are three benefits when firms vertically integrate. First, vertical integration and common ownership reduces the incentives of both parties to suboptimize or redistribute gains from exchange because the surplus resulting from an internal transaction accrues to the same owner (McFetridge 1994; Williamson 1998). Second, vertically integrated firms are able to ameliorate the aggressive advocacy and resolve conflict by invoking “fiat”, which is a more

efficient way to settle conflict than is arms length bargaining (e.g. haggling or litigation) characterized in inter-organizational conflict (Williamson 1998). Third, internally organized firms have a wider variety of control instruments that allows them to better enforce intrafirm activities and to reduce complications due to asymmetric information, uncertainty and risk aversion.

Chapter Four: Data Sources

Data Sources

Site Selection

The empirical data used in this study of coffee trading regimes or value chains was collected in Chiapas, Mexico[11]. Chiapas was chosen as the research site because of my personal interest in the state's affairs and my initial contacts. In 2006, I visited Chiapas for the first time. During this visit, I learned that Chiapas is an important player in Mexico's coffee production.

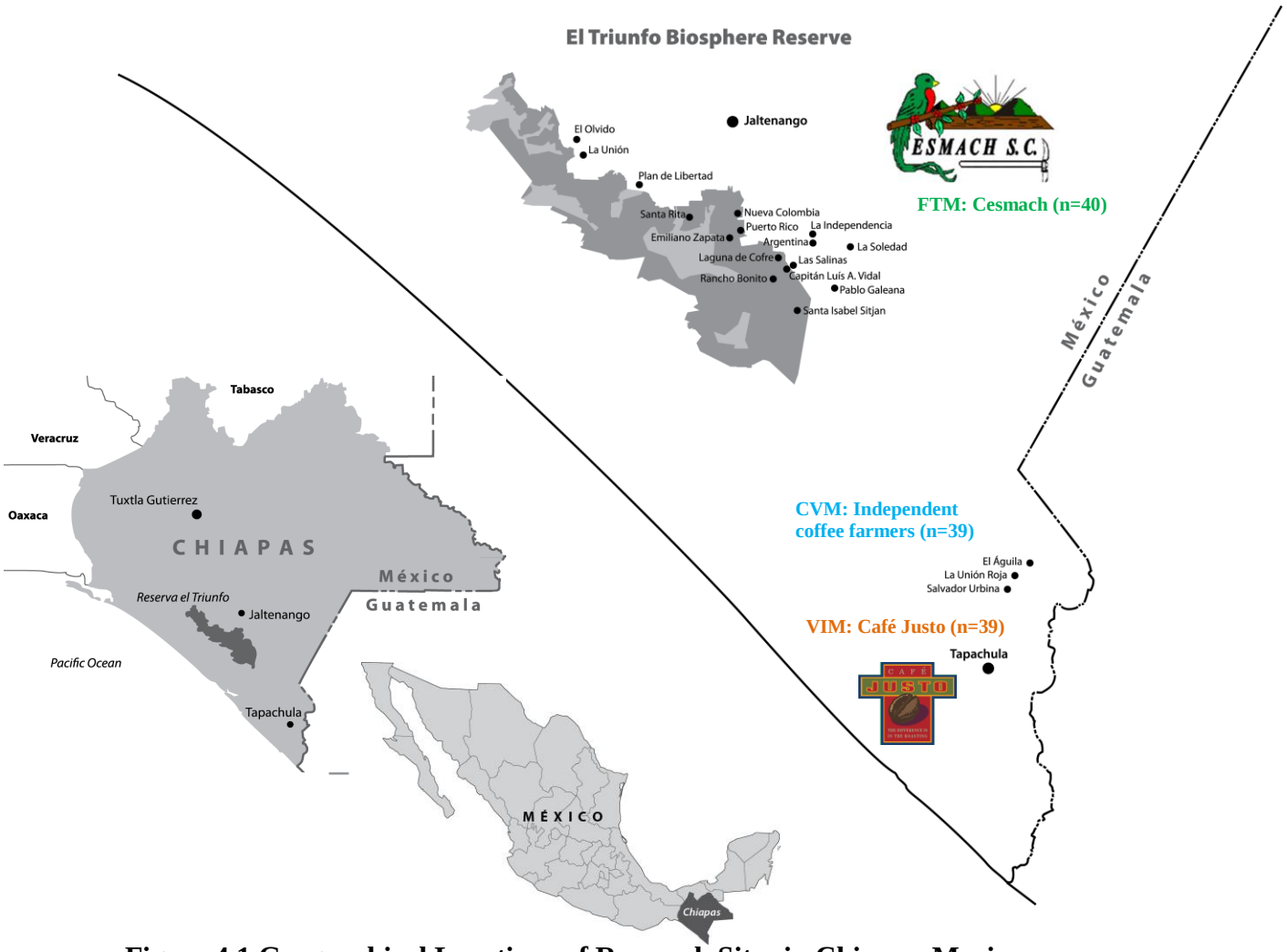


Figure 4.1 Geographical Locations of Research Sites in Chiapas, Mexico

[11] This study was approved by the Human Subjects Research and Institutional Review Board in the University of Arizona.

Currently, Mexico occupies the ninth place in the production and exportation of coffee, and thirteenth in coffee consumption worldwide. Mexico is the sixth third producer of Arabica coffee in the world, with ninety-six percent of its total production being Arabica and four percent Robusta (SAGARPA 2010)[12]. In addition to being an important producer and exporter of conventional coffee, Mexico is the third largest producer of organic-fair trade coffee, accounting for 9,500 metric tons in the 2009/10 crop year (FLO 2011e). Chiapas is the first of fifteen coffee producing states in Mexico, representing about forty percent of Mexico's total coffee production, followed by Veracruz (23%), Puebla (19%), Oaxaca (15%), and Guerrero (3%) (SAGARPA 2010; INEGI 2009).

Even though Chiapas is an important player in Mexico's coffee industry, it is the poorest state in the country with about seventy-seven percent of its population in multidimensional poverty and some of the highest incidences of social depravation (CONEVAL 2009). Social depravation refers to the lack of access to basic human needs such as education, healthcare, health insurance and food security (see table C.1). The disparity between Chiapas' key role as an important coffee producer and its high levels of multidimensional poverty made me question the efficiency of the prominent coffee trading system, leading my search for alternative trading models that increase the better benefit of coffee farmers in Chiapas. I established solid working relationships with key stakeholders in two coffee cooperatives who granted me access to visit and conduct research in Chiapas, Mexico. Chiapas is a compelling area to study because of the limited primary quantitative data previously collected on coffee trading systems.

[12] 84% of Mexico's Arabica production is washed Arabica processed through the wet method, while 12% is natural Arabica. The former produces higher quality coffee (SAGARPA 2010).

Recruitment

Because the purpose of the study is to measure the economic welfare in three coffee trading regimes, participants in the conventional, fair trade, and vertical integration regimes were recruited. The cooperative Café Justo, representing the vertical integration model (hereafter VIM), was contacted first via email in April, 2011. After the first email, constant communication was kept with the co-founder of the cooperative and director of the Just Trade Development Center. The VIM headquarters, located in Agua Prieta, Sonora, Mexico, was visited twice, in May and September of 2011. During the first visit, the project was introduced and a general understanding of the structure and organization of the cooperative was gained. At this meeting, I was given the contact information of the cooperative's secretary in Chiapas, Mexico, who later provided me with a written consent to participate in the study signed by the cooperative's president, treasurer and secretaries.

In the September visit to the VIM's headquarters in Agua Prieta, the survey questionnaire was pre-tested with a former coffee farmer from Chiapas who currently works at the headquarters assisting with the roasting. The survey was further pre-tested with two VIM members during my pre-visit to the field sites of Salvador Urbina (hereafter Urbina) and El Aguila, Chiapas, Mexico from December 13 to December 17, 2011 (see figure 4.1). In the pre-visit, I presented the project at one of cooperative's weekly meetings. I was pleasantly surprised by the members' commitment to not only participate in the project, but also to introduce me to their family members, friends and neighbors who would be interested to be part of the conventional group of non-affiliated/independent coffee growers. These initial contacts allowed me to use the snowball method to recruit the independent farmers in the conventional model, which I will refer to, from now on, as the CVM.

Representing the fair trade model (hereafter FTM), the members of Cesmach were

recruited during the summer of 2011 via an email, sent to the administrator of the cooperative, explaining the research project and expressing an interest in the participation of the members. A formal research proposal was subsequently provided to the administrator, who presented the proposal to cooperative's board of directors and they collectively approved the project. The lack of time and limited research funds prevented me from pre-visiting the FTM cooperative before January 2012.

Methods

This study uses a mixed-method approach, where both qualitative and quantitative data were collected through semi-structured interviews, participant observation and a household survey. By using a combination of different methods, I was able to cross-check important results and thus enhance the validity of the study.

Semi-structured interviews

Several semi-structured interviews were conducted with important stakeholders. An influential *coyote* or intermediary, who serves as a coffee buyer and credit provider for some farmers in the CVM and VIM, was interviewed. A member of the VIM arranged the interview with the *coyote* who he had known for many years. The interview began with an introduction of the project, emphasizing the important role *coyotes* play in the conventional coffee trading system. The interviewee was asked to give a recollection of how she became one of the most influential *coyotes* in Urbina, describing the role she plays as a coffee buyer and credit provider and the steps involved in these transactions.

The administrator of the FTM cooperative was interviewed multiple times in person and via email. He provided me with valuable information on the historical formation, organizational and governance structure of the cooperative, and informed me on the socioeconomic dynamics

and characteristics of the local coffee industry. Furthermore, the FTM administrator granted me access to the cooperative's dataset on membership, financing sources, social premium quantities and uses, as well as coffee production and sales from 1992 to 2012.

Several email, phone, and in person interviews were conducted with the co-founder, director of customer service and the secretary of the VIM cooperative throughout the project. The purpose of these interviews ranged from obtaining key information on the dynamics of the cooperative, their members, site location, to developing the cooperative's coffee value chain, and revising the survey questionnaire.

Participant observation

Participatory observation was used to better understand the cultural, social, economic and political environment of the visited communities. For the first two weeks of the field work research, I lived with and took part in the daily activities of a local coffee farming family in Urbina. Throughout my stay in Urbina, the town was suffering from lack of water so I walked, like many people in town, through steep coffee plantations in order to get to a river and do laundry. Not having enough water in January is a common issue that arises when the coffee growers in a neighboring community, from which Urbina obtains its water, utilize large quantities of water to wash their Arabica coffee. My laundry experience enhanced my understanding of the extent to which coffee production is intertwined in the daily dynamics of the population throughout the region.

Talking to local people, from and outside the three groups, provided useful insights on the history of the communities and the development of the coffee industry within these communities. These conversations allowed me to better understand the concerns that are important to small-scale coffee farmers. Walking through the communities also provided me

with a general understanding of the socioeconomic status and the challenges faced by each community. Observing how participants and non-participants work their coffee was helpful in visualizing the breadth and depth of the coffee value chain.

Attending meetings in both the VIM and FTM provided valuable information regarding the cooperatives' organizational and governance structures. I was able to attend several weekly meetings of the VIM, where updates on the amount of coffee bought from members and exported was given. At these meetings, payment arrangements were also discussed. I also attended the monthly meeting for the FTM, where the representative delegates from all communities were present. During these meetings, updates on the cooperative's performance and fair trade premium uses were given. Concerns from member communities regarding coffee production, sales and prices were also discussed.

Survey questionnaire

The principal data-gathering tool used in this study was a survey questionnaire administered to small-scale coffee farmers who had an active role in their home decision-making. One hundred eighteen coffee farmers from all three groups were surveyed during a three week period from January 9th to January 28th, 2012 in Chiapas, Mexico. The household survey consisted of two parts. The first part included quantitative questions on the farmers' quality of life (using variables such as house size, home floor and roof types, main source of water and electricity, etc.), coffee production and prices, and coffee dependency among other topics. Participants were asked to answer these quantitative questions for the current 2011/12 coffee crop year, as well as to recall the same information for the 2007/08 crop year. Although, the recall method has been criticized for not providing accurate data, I am confident that the recalled data is close to reality because (1) participants in the study did not hesitate when recalling the data, (2) cultivating

coffee is the main, and in some cases their only source of income, and (3) the income generated through coffee sales is acquired once at the beginning of the year and managed throughout the year, making data on coffee more memorable. The purpose of collecting data for two crop years was to measure the change in the farmers' economic welfare from 2007/08 to 2011/12. While 2011/12 was selected to illustrate the current crop period, 2007/08 was chosen because it was in 2007 when half of VIM farmers joined the cooperative, allowing me to have a larger VIM sample.

Part two of the survey included qualitative questions segmented into two subsections. In the first subsection, the internal evaluation analysis, participants identified the advantages and disadvantages they have obtained from participating in their respective trading system (e.g. CVM, FTM or VIM), as well as any recommendations to improve the benefits they receive from the trading systems. The second subsection, the external analysis, captured the perceptions that cooperative members have on the advantages and disadvantages in the conventional trading model, as well as the perception of CVM farmers on the advantages and disadvantages of the cooperative trading system. The intention of this subsection was to illustrate the reasons that lead coffee farmers to join or not join a cooperative. Qualitative responses were closely examined, coded into variables and quantified with the percentage of participants indicating each response.

Sampling

The study is based on a non-random, purposive sample of 118 coffee farmers. Thirty-nine of these coffee farmers are from the CVM, forty from the FTM and thirty-nine from the VIM. Participants in the FTM represent eight percent of the total cooperative members. Participants in the VIM account for about sixty-five percent of the total members and 100 percent of all active members in the cooperative (see table 4.1).

Table 4.1 Total Members and Sample Size in the CVM, FTM and VIM

	CVM	FTM	VIM
Sample size	39	40	39
Total members	n/a	478	60

The thirty-nine independent (non-organized) coffee farmers in the CVM were surveyed during a two-week period in the Urbina and El Aguila areas. As previously stated, independent farmers were referred by VIM members from the same region. The secretary from the VIM, a research assistant and I began the surveying process by going to the houses of the recommended independent families. In most cases, a VIM member would greet the independent farmer and introduce the research team. Having a community member introduce the research team was crucial in gaining trust of independent farmers and thus their decision to participate in the study. In addition, being a native Spanish speaker from an agricultural community in Zacatecas, Mexico was also influential in gaining the participants' trust and thus increased the accuracy of their answers.

The forty farmers representing the FTM were surveyed at the headquarters of the cooperative in Jaltenango, Chiapas[13] (see figure 4.1). The months of January and February are the busiest in the FTM because it is during these months that most of the members come into Jaltenango from distant communities, some driving from one to four hours, to sell their coffee to the cooperative. Taking advantage of that opportunity, I decided to stay at the headquarters and survey the members who brought their coffee to the cooperative. The majority of the interviews took place early in the morning and lasted thirty minutes on average, ranging from ten minutes to a maximum of an hour.

The thirty-nine participants in the VIM were surveyed in the same two-week period as

[13] In fact, 42 farmers were surveyed, but two surveys were not used because the farmers became members of the cooperative after 2007, the needed baseline for the study.

the CVM. Over half of the participants were interviewed before or after the weekly meeting in the cooperative's facility in Urbina. The rest of the participants were surveyed in their homes early mornings before leaving to their coffee plantations or late afternoons after they return from their farms. On average, the surveys took about an hour, ranging from twenty minutes to three and a half hours.

Chapter Five: A Case Study Analysis of Three Coffee Value Chains

This chapter begins by describing the three case studies representing the conventional (CVM), fair trade (FTM) and vertically integrated (VIM) coffee value chains, illustrating their governance structures and providing a brief history of their formation (in the FTM and VIM cases). The descriptive statistics are then presented to highlight the differences and similarities between the three value chains. The qualitative analysis—resulting from the second subsection of the questionnaire—is then presented to illustrate the perceptions of small-scale coffee farmers about their current trading regime as well as their perceptions about coffee farmers outside their trading system.

The CVM: Independent Coffee Farmers

The coffee farmers representing the conventional model are non-affiliated farmers who sell their coffee, dry cherries and/or parchment coffee, to local *coyotes* for a farm-gate price. *Coyotes* are middlemen (or intermediaries) who serve as coffee buyers and credit providers for many small-scale coffee farmers. In general, *coyotes* have the proper equipment and/or machinery to process the coffee by hulling, cleaning, sorting, grading and leaving the coffee ready for export. There are, however, some *coyotes* who do not have the necessary equipment to process coffee (e.g. hulling machine), but who have extra income to buy coffee at the farm-gate level and resell it to local factories (or "bigger" *coyotes*). Local factories then sell the *unwashed* (*washed*) green coffee to exporters at a factory-gate price (see figure 1.4).

The exporter pays a FOB price in the producing country before he/she sells the green coffee to an importer, who, in turn, pays a CIF price in the consuming country. The importing agent sells the green beans to either a trader/dealer or directly to food processors and coffee houses for a factory gate price (or wholesale price). It is at this stage where coffee is roasted,

blended, ground, and packaged, and thus where it acquires most of its value added. The resulting products, roasted and instant coffee, are then distributed to retailers who sell the coffee for home and out-of-home consumption (e.g. restaurants, caterers, coffee bars) at wholesale or retail prices. Because non-affiliated farmers sell their coffee as a nearly raw commodity, of which they have no control after the farm-gate transaction point, these farmers do not capture any of the value-added in later stages of the conventional value chain.

In the study, the thirty-nine independent farmers (CVM farmers) are from the communities of Urbina and El Aguila located in the Cacahoatan municipality in Chiapas, Mexico. Sixty-four percent of the CVM farmers have *ejido* land, while the remaining thirty-six percent have private land.

There are two significant differences between CVM farmers that can potentially determine their level of coffee profitability. First is whether or not CVM farmers obtain credit from local *coyotes*. Access to credit is critical for small-scale coffee farmers because coffee is a perennial crop that yields fruit annually and thus renders income only one time each year. Coffee farmers must manage/administer this income throughout the year to cover costs of production (e.g. purchase inputs) and subsistence (e.g. consumption), as well as fund any family emergency costs. Additionally, for many CVM farmers coffee income represents a large proportion of their total income. Given the volatile nature of coffee production and prices, and thus coffee income, many coffee farmers are compelled to request credit to finance their living expenses during *los meses flacos* or “the thin months.” The thin months refers to a four month period, from June to September, characterized by heavy rains in which farmers have exhausted their coffee income and diminished their food reserves. Given the limited or non-existent formal credit institutions, and the high risk and ‘unbankable’ characteristics of small-scale coffee farmers, borrowing from

coyotes is the most common source of credit for CVM coffee farmers.

Local *coyotes* provide credit to farmers in advance of the harvest conditional on the farmers' commitment to pay with their coffee harvest at a specified and generally low price. Anecdotal evidence suggests that *coyotes* collude to create non-competitive credit markets where high interest rates are imposed, creating a cycle of dependency. This cycle is represented by the constant need of coffee farmers to borrow money from *coyotes* year after year. Although coffee farmers are only required to "sell" an amount of coffee equivalent to their loan, in some cases there is an implied assumption that farmers must sell the entire harvest to the credit provider (*coyote*) as a sign of loyalty and to insure future credit availability. Furthermore, because farmers must pay the loan amount and the interest rates that the loan accrued throughout the year with coffee, they are left with little or no coffee to use as a safety net. Independent farmers who do not borrow from *coyotes*, presumably better-off farmers, can profit from coffee because they are not tied to a single buyer and high interest rate. That is, these farmers have the ability to negotiate by looking for or waiting for buyers with better price offers.

The second marked difference among CVM coffee farmers is their dedication and/or ability to maintain their coffee plantations. In many small-scale farms, maintenance activities range from weeding, pruning, and applying fertilizer (organic or commercial) to introducing natural predators to control pests and diseases. The level of maintenance of the coffee plantation and the processing method used by the farmer are direct indicators of the price farmers receive for their coffee. Farmers who keep their coffee trees in excellent condition and use appropriate processing equipment produce better quality coffee, which translates into higher prices.

Coyotes randomly sample the farmers' coffee and look at the percentage of defects and humidity level, discounting low quality coffee. Some farmers are willing, or are forced, to sell

their coffee in a raw or semi-raw condition because (1) they lack processing equipment such as drying patios and de-pulping machines, (2) cannot afford to pay to use someone else's equipment, (3) are of advanced age and cannot perform these tasks themselves or do not have the extra income to hire a person to properly maintain/process the coffee for them, or (4) some combination of the above.

CVM farmers, who do not borrow from *coyotes* and are willing and able to properly maintain and process their coffee, are relatively better off than farmers without these qualities. In this sense selling coffee to a *coyote*, despite the low or fluctuating price, can be beneficial to farmers who produce high quality coffee and are debt free.

The FTM: Campesinos Ecológicos de la Sierra Madre de Chiapas (Cesmach)

Cesmach was formed in 1992 when a group of twenty-five coffee farmers, concerned with low coffee prices, attended a community education program that offered workshops on quality control, environmental literacy, community development and organic coffee production. These workshops influenced Cesmach's early leaders to focus on organic production as a way to not only profit economically from the higher price paid for organic coffee, but also to comply with the environmental laws set to protect the ecosystem in the region. In 1994, Cesmach became a legal registered organization, and two years later, it obtained its first organic certification. Today, Cesmach has five different organic certifications that meet organic standards in the United States, Europe and Japan.

From 1999 to 2002, Cesmach worked with Conservation International (CI) to commercialize its shade-grown coffee in Starbucks locations in the United States. The project established a value chain where Cesmach and other coffee cooperatives supplied the coffee,

AMSA processed the coffee, and Starbucks was the buyer[14]. Starbucks guaranteed to buy the entire cooperative's harvest at good prices. Cesmach ended this trading relationship in 2002 after CI demanded larger coffee volumes which Cesmach could not meet unless it began intensifying its production by using commercial fertilizers.

Because organic production was important, Cesmach leaders suggested to CI that they add other cooperatives to meet Starbucks' coffee demand. CI rejected the proposition. Knowing that they could find other suppliers to meet the Starbucks coffee demand for quality and quantity, and that cheaper coffee processing was available, Cesmach and other cooperatives proposed a direct relationship with Starbucks. Under this direct relationship they, instead of AMSA, would be in charge of processing the coffee, and thus capture higher returns. This proposition, however, was also rejected, leading Cesmach and other organizations to not renew the contract and seek other markets for their coffee. After breaking its relationship with CI, AMSA and Starbucks, Cesmach entered the fair trade network (FTN) which allowed the cooperative to maintain its production practices, capture higher coffee prices and expand its international client base. Today, Cesmach works with twenty importers from the United States, Europe and Japan.

Cesmach is composed of 478 member-families from four municipalities located in the buffer zone of El Triunfo Biosphere Reserve in the Sierra Madre Mountains of Chiapas. Figure 4.1 illustrates the geographical location of the Cesmach members' coffee farms. While the sample study includes farmers from all four municipalities—namely Angel Albino Corzo (AAC), La Concordia (LC), Siltepec (SL) and Montecristo de Guerrero (MC)—about seventy percent of participants were from SL and MC. In addition, about ninety percent of the participants are *ejidatarios*, eight percent have private land and two percent live on communal

[14] AMSA or *Agroindustrias Unidas de Mexico* is a multinational company that produces and commercializes different products, coffee being one of them.

land. Due to the altitude of their coffee plantations, which range from 1000 to 1400 meters above sea level, most of the members exclusively cultivate Arabica coffee.

Cesmach's administrative office, roasting facility and warehouse are located in Jaltenango, Chiapas. Jaltenango is the largest commercial center for coffee in the region, where local traders and *coyotes* have been displaced by transnational corporations like AMSA, Cafés California, Expo Granos, Nestle and Starbucks. Jaltenango serves as a commercial center where Cesmach members, and non-member coffee farmers from different communities, sell their coffee harvest, buy goods for family consumption (e.g. food, clothing, and household appliances) and equipment for production (e.g. machinery, machetes, sacks, and baskets).

The structural organization of Cesmach follows the fair trade standards for transparency and democracy. The structural organization of Cesmach includes a General Assembly, council delegates, regional board of directors, supervisory board, and a general coordinator, among other areas (see table D.1 for details). Both the yearly General Assembly and monthly council of delegates meetings are mandatory meetings, in which absent delegates are sanctioned or penalized (e.g. fined). During the council of delegates meeting, there is a reading of the (1) previous month work agenda, (2) current work agenda brought by each delegate from their respective communities, and (3) bulletin named "*Un Paso Más"* or "A Step Forward." The work agenda that delegates take to the meeting commonly includes a list of the communities' needs, and the agreements and disagreements regarding coffee production and sales. *Un Paso Más*, on the other hand, not only reports on the improvements on coffee production, community development projects, financing and marketing, but it also allows the members to set monthly goals regarding these topics. These goals are added to the bulletin at the end of the meeting, which delegates take to their respective communities to discuss during the regional board of

directors meeting.

The history and structural organization of Cesmach has caught the attention of multiple master and doctoral students who have focused their theses/dissertations on the cooperative. The theses/dissertations have provided Cesmach with important written information regarding the cooperative's history, structural structure, and the members' coffee quality. In addition, Cesmach uses these theses/dissertations to promote its coffee to new clients.

The VIM: Café Justo

The Café Justo concept was born in 2000 from the testimony of a former Chiapanecan coffee grower who migrated to Agua Prieta, Sonora, Mexico when low coffee prices, in combination with the aftermaths of hurricane Mitch (his house and coffee plantation were severely damaged), drove him to seek new economic alternatives (Adams and Bassett III 2009). The idea that small-scale coffee farmers would have no incentive to migrate north if they had sustainable economic opportunities in their own communities led a Presbyterian pastor, business manager and this former coffee farmer to design a business plan to promote economic sustainability for coffee farming families in Urbina. With a USD$20,000 loan from the Presbyterian Church, the business plan became a reality in 2002, and the plan was presented to coffee farmers in Urbina. The business idea came to farmers at a perfect time when world coffee prices were at a record low and coffee farmers needed an alternative coffee trading channel in which perceived power asymmetries featured in the conventional coffee trading system (CVM) would be eliminated. In 2002, Café Justo became a legal registered organization and in 2005 it obtained organic certification. Despite the fact that Café Justo has been part of the fair trade system, it was not able to use the fair trade label because Café Justo exports the final product (e.g. roasted, ground coffee) instead of green coffee, the required coffee form by the fair trade system. The fair trade

standards are changing and since July 2012 Café Justo can now use the fair trade label.

Café Justo is composed of sixty members from the communities of Urbina and El Aguila. While all of members from Urbina were recruited when Café Justo was first formed in 2002, the coffee farmers from El Aguila became members in 2007 as the cooperative's coffee demand increased and there was a need for a larger supply. Today, Café Justo is recruiting coffee farmers from other coffee growing regions in Mexico including Northern Chiapas, Nayarit, and Veracruz. To become a Café Justo member, farmers must be (1) Mexican citizens, registered with *Hacienda* (e.g. Treasury Department) and (3) must be *ejidatarios*.

Because the concept of Café Justo was based on the idea of providing the economic means necessary for coffee farmers to prosper in their communities, the cooperative was designed in a vertically integrated way in which the members have total control of their coffee from production in Chiapas to final retail in the United States (see figure D.3). In the upstream of the value chain are the small-scale farmer members who take their harvested coffee (dry cherries and/or parchment coffee) to the local factory in Urbina, where the coffee is hulled, cleaned, sorted, and bagged into 60-kg sacks of green coffee. It is at this factory where the members meet weekly to discuss coffee production and price issues. The local factory also serves as the only farmer-owned roasting facility in Urbina where coffee is roasted and ground for local consumption. Cooperative members can roast and grind coffee for personal consumption or to resell to community members who do not cultivate coffee. Because cooperative members paid a subsidized cost of MXN$5.00 per kilo to roast and grind coffee and can resell it at MXN$100.00 per kilo, members can economically benefit from these transactions. The local demand for roasted ground coffee is, however, very small as the majority of community members are coffee growers. Coffee growers who are not members of the cooperative pay MXN$10.00 to roast and

grind coffee for personal consumption.

After being processed in the local facility in Urbina, the green coffee is sent by bus to Agua Prieta, Sonora, Mexico where the second Café Justo facility is located. Café Justo collectively and strategically decided to have the main headquarters and roasting facility in Agua Prieta for two reasons. First, it allows Café Justo to sell freshly roasted coffee to the cooperative's main consumer base in the United States. While Café Justo sells a small proportion of their coffee in Agua Prieta, the majority of the coffee is exported to the United States with Arizona accounting for the largest sales share. As such, being located in the Sonora-Arizona border is critical to the cooperative. Second, the headquarters' location provides the cooperative with a support network from the Just Trade Development Center and the ministry that provided the loan to start the business. The Just Trade Development Center, located in Douglas, Arizona, is a big asset in the commercialization of the cooperative's coffee. The Just Trade Development Center was created and it is run by the founders of Café Justo to not only support the Café Justo cooperative, but also duplicate the same model (e.g. vertical integration) with other small-scale coffee farmers from other parts of Mexico. People from all around the US come to the Just Trade Development Center to learn about Café Justo and to take tours of the roaster in Agua Prieta, Mexico.

Because creating sustainable trading relationships has always been a goal in the Café Justo cooperative, the director of the Just Trade Development Center and co-founder of Café Justo, in coordination with the cooperative members, organize coffee travel delegations to Urbina. In these travel delegations, North Americans who consume Café Justo coffee or who are interested in the well-being of coffee farmers visit the VIM producers. The intention of the visits is to increase the awareness of North American consumers about the living conditions of the

farmers who grow the coffee they consume and the production process that is required in order for them to enjoy a cup of coffee. During the visits, North Americans stay with VIM members, who provide lodging and meals. North Americans in return pay USD$20.00 per day to support the coffee farming family with living expenses. In addition to the economic support of USD$20.00, these visits benefit the coffee farmers because the visitors return to the U.S. and begin promoting the cooperative's coffee. In some cases, the North American visitors become active promoters of the coffee and even take additional visitors on their own to the community.

Descriptive Statistics

Aside from participating in three different coffee trading regimes, there are significant differences between the farmers in the sample. Table 5.1 presents the means of selected variables to compare and contrast the three groups. The means for both the 2007/08 and 2011/12 crop years are presented to compare changes over time between and within groups. The selected variables are divided into sections including household characteristics, diversification, coffee productivity, market channels, and off-farm income.

Household Characteristics

While CVM and VIM farmers present similar household characteristics, perhaps because they are located in the same regions, those in the FTM differ in many respects. FTM farmers are, on average, twelve years younger, less educated, and have a larger household size and lower percentage of female household heads than CVM and VIM farmers. VIM farmers have the largest percentage of married household heads (81%) followed by FTM (78%) and CVM (69%).

Table 5.1 Descriptive Statistics by Group (*means)

Variable	Mnemonic	Unit	CVM (n=39)		FTM (n=40)		VIM (n=39)		POOLED GROUP (n=118)	
			2007/08	**2011/12**	**2007/08**	**2011/12**	**2007/08**	**2011/12**	**2007/08**	**2011/12**
Household characteristics										
Age of household head	age	Years	53.44	58.44	41.05	46.05	52.79	57.79	49.03	54.03
Education of household head	educ	No. years	5.18	5.18	4.20	4.20	5.95	5.95	5.10	5.10
Gender of household head	female	% of females	0.23	0.23	0.08	0.08	0.10	0.10	0.14	0.14
Household size	hh_size	No. people in house	5.15	5.36	6.45	6.08	5.59	4.69	5.74	5.38
Marital status of household head	married	% of married	0.87	0.69	0.68	0.78	0.85	0.81	0.81	0.77
Diversification										
Total productive land	total_land	ha	2.90	2.99	9.01	9.24	4.44	4.03	5.48	5.45
Hectares cultivated with coffee	coffee	ha	2.32	2.49	4.23	4.91	3.43	3.18	3.36	3.54
Hectares cultivated with basic crops	basic_crop	ha	0.09	0.01	0.66	0.67	0.15	0.04	0.30	0.24
Hectares cultivated with (non-coffee) cash crops	cash_crop	ha	0.34	0.42	0.18	0.06	0.56	0.54	0.36	0.33
Fallow land	Fallow	ha	0.14	0.08	3.94	3.60	0.31	0.27	1.48	1.34
Productivity										
Percentage of cultivated Arabica coffee	arabica_pct	% of coffee area	0.24	0.17	1.00	1.00	0.42	0.30	0.56	0.50
Percentage of cultivated Robusta coffee	robusta_pct	% of coffee area	0.76	0.83	0.00	0.00	0.58	0.70	0.44	0.50
Yield of Arabica coffee	arabica_yld	kg/ha	194.35	81.79	549.99	550.33	315.88	169.65	355.07	269.66
Yield of Robusta coffee	robusta_yld	kg/ha	1062.24	1034.03	0.00	0.00	820.20	732.30	622.16	583.79
Market										
Percent of total Arabica coffee sold to the cooperative	coop_arabica	%	N/A	N/A	0.92	0.97	0.20	0.20	0.39	0.40
Percent of total Robusta coffee sold to the cooperative	coop_robusta	%	N/A	N/A	0.00	0.00	0.00	0.10	0.00	0.03
Percent of total Arabica coffee sold to the *coyote*	coyote_arabica	%	0.23	0.16	0.08	0.03	0.20	0.10	0.16	0.09
Percent of total Robusta coffee sold to the *coyote*	coyote_robusta	%	0.76	0.83	0.00	0.00	0.60	0.60	0.45	0.48
Off-Farm Income										
Household head out of farm employment	employment	% of farmers employed	0.36	0.15	0.08	0.18	0.10	0.13	0.18	0.15
Household head business owner	business_owner	% of business owners	0.08	0.15	0.10	0.10	0.08	0.15	0.08	0.14

*Means: The variables female, married, organic_cert, employment, business_owner are binary variables for which percentages are presented. The rest of the variables are continuous variables presented with their means N/A = Not Applicable

Diversification

The coffee area (coffee_ha), measured as the hectares of cultivated coffee with respect to total productive land (total_land) differ significantly across the three groups. In general, farmers in the FTM have larger farms and more hectares of coffee cultivated, followed by VIM farmers and then CVM farmers. Farmers in the FTM have, on average, six and five more hectares in total land than CVM and VIM farmers, respectively. Despite the fact that FTM farmers only used about half of their total land to cultivate coffee—while CVM and VIM farmers used about eighty percent—their coffee area is still about two hectares more than CVM and VIM farmers.

In addition, while CVM and FTM farmers showed an increase in both coffee area and total area from 2007/08 to 2011/12, VIM farmers had a decrease in both. For the most part, decreases in total land reflect a common practice in the study area, in which parents transfer some land to the oldest sons/daughters as an inheritance. Selling land is a less common, but possible, explanation as well. Despite the fact that total land in the VIM decreased by an average of 0.42 hectares, the coffee area decreased by a smaller amount of 0.25, implying that some of the inherited/sold land was non-coffee land.

When hectares of land are further disaggregated, one can observe that in addition to having the largest coffee area, FTM farmers also have the largest amounts of fallow/uncultivated land. FTM farmers have, on average, four hectares of fallow land compared to 0.1 and 0.3 hectares in the CVM and VIM, respectively. Having their coffee plantations in the buffer zone of El Triunfo Biosphere Reserve in the Sierra Madre Mountains of Chiapas restricts FTM farmers in the amount of land that can be cultivated; hence the large amounts of fallow land.

In addition, FTM farmers grow, on average, 0.65 and 0.55 more hectares of basic crops than CVM and VIM farmers, respectively. In general, while coffee plantations (e.g. coffee_ha) are from one to three hours away from the farmers' homes, basic crops are grown in plots nearer

the farmers' homes at distances of less than an hour away. Non-coffee cash crops are grown in both the coffee plantations, as it is the case of banana trees used for shade, and in plots nearer farmers' home, as it is the case with cacao trees and rambutan.

Traditionally, farmers in the communities of Urbina and El Aguila, where the CVM and VIM are located, grow basic crops (e.g. beans and corn) to survive during the "thin months." During the past five years, young males have began to steal their neighbors' basic crops, domestic animals (e.g. pigs, hens), and cash crops including coffee. Anecdotal evidence suggest that when these young males—who migrated north (to the U.S. or towns in the U.S.-Mexico border) in search of better economic opportunities—returned to their communities (because they had a difficult time making a living in the north and/or were deported) they struggled to reintegrate into their communities. Many of these young males changed their way of dressing, speaking, and no longer wanted to work in agriculture. And because there are limited employment opportunities, they opted to steal other people's coffee, beans, corn, bananas, and even pigs and hens to resell them in Tapachula[15]. This new reality has lead farmers from these regions to decrease, and in many cases, abandon basic crop producing practices, despite their need for these crops, because the time, energy and money they spend cultivating these crops is enjoyed by the thieves. This phenomenon is non-existent in the FTM communities.

Despite the fact that coffee cherries are not exempt from being stolen by young unemployed males, farmers acknowledged the "locked-in" effect of coffee production and are reluctant to switch to alternative crops. Thus, even when their coffee is being stolen, CVM and VIM farmers continue its production. They have, however, used two systems to prevent their coffee from being stolen. The first involves guarding the coffee by temporarily moving closer to

[15] Tapachula is the closest city to both communities and one of the largest cities in the state.

and taking random night trips to the coffee plantation, or pay someone else to take the trips. However, because farmers fear putting their life in danger if the thief is armed, this option is not common. The second option entails harvesting the coffee before it is ripe. This option devalues the coffee because drying green coffee creates dark spots, which are considered defects and so the growers receive a lower price. Some farmers prefer to harvest their coffee green rather than wasting their invested time and money and have some stranger take all the profits.

Another significant distinction among the three groups is that FTM farmers have, on average, less non-coffee crops for sale than CVM and VIM farmers. Banana (of different varieties) is the most common crop that CVM and VIM farmers sell besides coffee because banana trees are used for shade in the coffee plantations. While banana trees (sale crop) are used to shade coffee trees in the CVM and VIM, it is less common to use fruit trees as shade in FTM coffee plantations. Because FTM coffee plantations are located in a natural reserve with diverse vegetation and at a higher elevation, FTM farmers use the natural canopy to provide shade to the coffee trees. Consequently, while non-coffee cash crops are higher in both the CVM and VIM, there are little or no cash crops cultivated in the FTM farms besides coffee.

In addition, VIM farmers have, on average, more crops for sale (e.g. banana trees used for shade) than those in the CVM. This result is mainly driven by the larger percentage of Arabica coffee grown by VIM farmers. In the 2011/12 crop year, for example, thirty percent of VIM farmers' coffee production was Arabica compared to seventeen percent for CVM farmers.

Productivity

The Arabica-Robusta crop mix is of high importance in both the CVM and VIM. There are three important trends worth noting among CVM and VIM farmers. First, both groups produced more Robusta than Arabica coffee, with well over half of their production being Robusta in 2007/08

and 2011/12. Second, both groups experienced a decrease in Arabica production and an increase in Robusta production from 2007/08 to 2011/12. Third, both Robusta and Arabica yield decreased in the CVM and VIM from 2007/08 to 2011/12. Arabica yield maintained, on average, the same level in the FTM.

According to farmers in both the CVM and VIM, the continuous decrease in Arabica and increase in Robusta coffee in the region is due to the (1) increase in pests that attack Arabica coffee plants, (2) the aftermath of hurricane Stan, and (3) farmers' responses to these events. Coffee berry borer (*broca*) and coffee rust (*rolla*) are the most common pests in Chiapas, Mexico. Robusta coffee, however, is less susceptible to these pests, hence its increasing trend (refer to table A.2 for key differences between Arabica and Robusta coffee).

In 2005, hurricane Stan hit the Soconusco region of Chiapas, where the farmers in all three groups are located (see figure D.2). According to CVM and VIM farmers, the decreasing production trend of Arabica coffee was influenced by the tropical rains that resulted from the 2005 hurricane Stan. Because heavy rains cause coffee cherries to fall and trigger landslides, and because Arabica coffee is less resistant to these adverse weather conditions than Robusta, many farmers are gradually switching to Robusta coffee due to weather risk. Supporting the farmers' arguments, Philpott *et al.* (2008) conducted a study that examined the effects of hurricane Stan in ten different coffee farms and their surrounding areas in the Soconusco region. The authors found, among other results, that (1) most of the damage—fruit drop, landslide, damage to buildings and infrastructure—was caused by excessive rainfall, and (2) farms with complex/diverse vegetation were less affected.

The second result can possibly explain why Arabica production is increasing in the FTM despite the fact that the region was also hit by hurricane Stan. As previously mentioned, coffee

farms in the FTM have more diverse/complex vegetation compared to the CVM and VIM. The shade trees used in the FTM are diverse with some having leaves that protect coffee plants from heavy rains and some with taproots that prevent/reduce soil erosion and landslides. In fact, having diverse/complex vegetation, which prevented severe hurricane adverse effects and soil erosion, can possibly explain the constant Arabica yield observed in the FTM.

Market

In addition to the important Arabica-Robusta production relationships, the channel through which each type of coffee is commercialized represents important contrasts as well. This is particularly true to VIM farmers, who sold about eighty-two and seventy-three percent of their coffee production to *coyotes* in the 2007/08 and 2011/12 coffee years, respectively. CVM farmers only sold coffee to *coyotes* and FTM farmers sold mostly of the coffee through their cooperative. In 2011/12, for example, FTM farmers only sold three percent of their total production to *coyotes*. VIM farmers, on the other hand, diversified their coffee commercialization between the cooperative and *coyotes*.

In the 2007/08 crop year, the VIM cooperative was buying Robusta coffee only sporadically; it was not until 2011/12 that it began buying small amounts of 500 kilos of Robusta from each member. Before the cooperative began buying Robusta coffee, VIM farmers would sell all their Robusta to *coyotes*[16]. Although VIM farmers have the capacity to sell large quantities of Robusta coffee—as they produce more Robusta than Arabica coffee—the cooperative does not have a strong market for this variety and thus cannot buy large quantities of Robusta. Consequently, VIM respondents would like the cooperative to have a constant and strong market for Robusta coffee so that the members can commercialize most of their coffee

[16] In the 2007/08 crop year only 0.22 percent of the total Robusta coffee production was sold to the cooperative in the VIM.

(both Arabica and Robusta) through the cooperative and benefit from the higher prices.

As of now, however, VIM farmers use Robusta coffee as a safety net because it provides them with a source of immediate cash flow to survive during the "thin months" and/or to pay for any outstanding debts they might have acquired with local *coyotes*. Obtaining credit from *coyotes* is a double-edged sword because although it can help when in need, it also compromises the farmers' coffee harvest. In some cases, the debt is so high that IVM farmers need to also sell part of their Arabica coffee, which may be reserved for the cooperative. In fact, VIM farmers sold, on average, thirty-four and fifteen percent of their Arabica production to *coyotes* in the 2007/08 and 2011/12 coffee years, respectively.

Off-Farm Income

Farmers from all three models used other off-farm income to complement their coffee income. While there was an increase in off-farm employment of ten and three percent in the FTM and VIM respectively, CVM farmers showed a twenty-one percent decrease in off-farm employment from the 2007/08 to 2011/12 coffee years. This large decrease in off-farm employment may imply that focusing on coffee production was more profitable in 2011/12 than 2007/08, perhaps because of the higher world coffee prices in 2011/12. In addition, about eight percent of CVM and VIM farmers became business owners from 2007/08 to 2011/12, whereas there was no change in the percentage of business owners in the FTM.

Qualitative Analysis: Internal Evaluation on Each Value Chain

Table 5.2 illustrates the advantages and disadvantages coffee farmers in the three models obtained from participating in their respective trading systems, as well as their suggested improvements to enhance the benefits. Special focus will be given to the top three advantages,

disadvantages and suggested improvements in each trading system. References to other indicators will only be provided occasionally when considered appropriate.

The Conventional Model (CVM)

Advantages

CVM coffee farmers indicated that prompt cash payments, access to credit, and flexible coffee buying practices are the top three advantages they obtain when selling their coffee through the conventional channel. Receiving a prompt cash payment is the most significant benefit for CVM farmers. Coffee farmers are paid annually at the end of the harvest season and at the point of sale. In general, CVM coffee farmers borrow money before and/or during the harvest season to (1) pay for inputs throughout the year, (2) finance subsistence costs during the "thin months," and (3) hire labor during harvesting season, thereby compromising a large proportion of their sales revenues before they sell their coffee. As such, the importance of prompt cash payments is intertwined with credit availability for CVM farmers. In fact, thirty-six percent of CVM farmers viewed access to credit as the second largest benefit.

Formal credit institutions in the study region offer little or no credit to small-scale farmers because they encounter asymmetric information and adverse selection problems. That is, lenders are unwilling to provide credit to small-scale farmers because they do not have access to and/or it is costly to obtain complete information about the farmers' financial situation and repayment intentions. The farmers who are the most interested in seeking out loans and accepting high interest rates are more likely to default than farmers who are more averse to get loans with high interest rates (Doward *et al.* 2001). Consequently, lenders are reluctant to provide credit to farmers who are willing to take high interest rates. Overcoming these problems require lenders to incur significant transaction costs (e.g. screening borrowers, monitoring and enforcing contracts), reducing/eliminating access to credit for small-scale coffee farmers.

Table 5.2 Advantages, Disadvantages and Suggested Improvements (percentage of respondents)

CVM (n=39)						FTM (n=40)						VIM (n=39)					
Advantages	***%***	***Disadvantages***	***%***	***Improvements***	***%***	***Advantages***	***%***	***Disadvantages***	***%***	***Improvements***	***%***	***Advantages***	***%***	***Disadvantages***	***%***	***Improvements***	***%***
Prompt cash payment	38	fluctuating-low prices	54	credit at low/no interest rates	38	credit with low interest rate	85	payments by installments	18	increase projects	100	higher/fixed price	87	payments by installments	56	restructuring	79
credit	36	no control after farm-gate level	15	form a coalition	36	higher/fixed output prices	55	High commitment levels	8	higher prices	30	health insurance	41	no credit	13	provide credit/ pre-financing	46
non-selective coffee buyer	26	no proof of sale	15	higher output prices	31	access to programs	45	selective coffee buying	5	restructuring	28	better money administration due to payment system	31	unequal benefits (health insurance)	13	higher prices	31
If not indebted, liberty to sell to highest bidder	15	conveniently-calibrated scales	15	provide proof of sale	10	organic production practices	30	disconnection between staff & farmers	3	increase credit with low/no interest rate	13	access to government programs	23	transportation cost	5	Prompt cash payments	23
no transportation cost	10	high interest rate	13	more equitable trading terms	10	access to machinery	23	no health insurance	3	increase buying capacity	8	direct trading partnerships	20	disconnection between roaster & farmers	3	increase membership base	21
		Damage farmers' coffee sacks	7			price/social premium	23	low prices	3	awareness on organic production, environment & sustainability	3	access to machinery	18	low commitment	3	increase projects	18
						sustainable & direct trading relationships	21	*none*	*43*			organic production practices	10	selective coffee buyer	3	increase Robusta buying capacity	8
						better money administration due to payment system	18					community network	5	*none*	*21*	equal benefits (health insurance)	5
						pre-financing	13					democratic & transparent practices	3				
						democratic & transparent practices	13										
						community network	13										

Formal credit institutions in the study region offer little or no credit to small-scale farmers because they encounter asymmetric information and adverse selection problems. That is, lenders are unwilling to provide credit to small-scale coffee farmers because they do not have access to and/or it is costly to obtain complete information about the farmers' financial situation and repayment intentions. According to Dorward *et al.* (2001), the farmers who are the most interested in seeking out loans and accepting high interest rates are more likely to default than farmers who are more averse to get loans with high interest rates. Consequently, lenders are reluctant to provide credit to farmers who are willing to take high interest rates. Overcoming these problems will require lenders to incur significant transaction costs—such as searching and screening potential borrowers, as well as monitoring and enforcing the contract—reducing or eliminating access to credit for small-scale coffee farmers.

Being able to obtain credit from *coyotes* is an advantage for small-scale coffee farmers who need cash flow to invest in the coffee plantation, smooth household consumption over time, and cover family emergencies. Despite the fact that credit access is beneficial to many farmers in the CVM, thirteen-percent of these farmers indicated that *coyotes* charge a high interest rate that limits their profitability.

The flexibility of *coyotes* to buy coffee at any processing level (or even unripe coffee) is the third largest advantage identified by twenty-six percent of CVM farmers. As previously mentioned some farmers have to sell their coffee in a raw or semi-raw condition because they do not have the proper processing equipment or are of advanced age and cannot perform processing tasks. Consequently, these farmers benefit from *coyotes*' non-selective buying practices. The benefit of selling unprocessed or semi-processed coffee, however, comes at the cost of receiving lower prices.

Disadvantages

A little over half of the respondents (54%) identified fluctuating and low coffee prices as the greatest disadvantage in the CVM. In Urbina and El Aguila, c*oyotes* collude to exercise regional market power by creating a non-competitive low-price coffee market, leaving farmers with little or no bargaining power. In addition, there is price information asymmetry as *coyotes* have, in general, more access to price information than farmers. Even when farmers have information on coffee prices, it is still difficult for them to exercise bargaining power. Coffee farmers from Urbina, for example, were aware that *coyotes* in a nearby community (located 1 hour and 15 minutes away) were offering higher coffee prices. The high transportation cost, however, made it uneconomical for farmers to take their coffee to that community, forcing farmers to sell their coffee to local *coyotes*. According to a CVM participant, it would have cost him MXN$400 to take the coffee to that community, plus another MXN$40 per quintal to unload the coffee sacks, escalating the total cost of transport to a level that many farmers in the region are unwilling and/or unable to pay. Local *coyotes* in Urbina, alternatively, cover transportation costs as they drive around the town buying coffee. In this sense, selling coffee to *coyotes*, despite the low and fluctuating prices, can reduce transaction costs for farmers.

Conveniently-calibrated scales, no proof of sale, and loss of control after the farm-gate level, tied as the second most identified disadvantages in the CVM. According to CVM farmers, *coyotes* use conveniently-calibrated scales to appropriate anywhere from a kilo or two for every quintal (57.5 kg sacks), which for a typical transaction of ten quintals allows the *coyotes* to steal 10-20 kilos.

CVM farmers are aware of their disadvantaged position as providers of a raw/semi-raw commodity that has little value added when sold at the farm-gate level. Farmers do not have control of their coffee after it is sold to *coyotes* and therefore cannot accrue any profits from the

value-added at higher levels in the coffee value chain. As a farmer from the CVM better explains, "if final coffee prices are higher than what was initially expected by the *coyotes*, we do not get any residual income. *Coyotes* with higher position in the value chain capture all unexpected extra income. And we, the owners of the raw commodity, get nothing" (interview, 2012).

CVM farmers perceive the unwillingness of *coyotes* to provide a proof of sale (e.g. receipt) as a shortcoming because it eliminates the possibility of growers receiving extra income (incentive payments) from government programs after selling their coffee. In Chiapas, there are two government programs that provide economic support to coffee growers who can prove they commercialized coffee. The first is the *Fomento Productivo* (or the Productivity Development program) which—as part of the Mexican Association of the Coffee Production Chain (AMECAFE)—was created to promote competition among coffee producers by increasing quality and productivity. Under this program, registered coffee buyers (independent buyers or cooperatives) electronically document the names of farmers and the amount of coffee they sold to the buyer. Coffee buyers withhold about thirty pesos (USD$2.15) per quintal from each coffee farmer. The withhold money is then deposited into an AMECAFE account. Farmers who sell coffee to AMECAFE-registered buyers are given account numbers that are used as proof of commercialization to obtain a cash stipend of about MXN$700 (USD$50.37) per quintal from *Fomento Productivo*. Farmers who sell to non-registered or unauthorized buyers do not get a confirmation or account number and therefore cannot receive the government stipend.

The second government program that supports coffee farmers in Chiapas is the *Fondo de Compensacion de Precios de Café* (or the Coffee Prices Compensation Fund), in which registered/authorized coffee buyers withhold a percentage of the total amount (e.g. money) of

coffee sold to compensate farmers with up to USD$20 per quintal when world prices are low. If world prices are high, the withhold money is kept in the fund for seasons with low coffee prices. In order to receive the stipend, farmers are required to show proof of commercialization.

Many *coyotes* are not registered buyers because (1) there is a yearly fee of MXN$5,000 (USD$359.34) to be registered with AMECAFE, and (2) being registered buyers does not directly benefit *coyotes*. There are, however, some *coyotes* who become registered buyers to secure coffee quantities by incentivizing farmers with the government stipend. Moreover, many CVM farmers believe that registered *coyotes* negate the receipts (or proof of sale) because they claim the sold coffee as their own in order to receive the stipend. Other CVM farmers believe that registered *coyotes* give the receipts to individuals based on favoritism. A participant explained that he no longer receives the stipend, and his neighbor, who does not grow coffee, gets the government stipend for commercializing coffee. As a result, ten percent of CVM farmers would like to have more equitable trading terms in which *coyotes* act as responsible buyers and provide them with a receipt so that they can obtain their subsidy.

Improvements

In order to improve their economic condition and trading relationship with *coyotes*, CVM farmers suggested that *coyotes* need to increase their credit line with lower or no interest rates. Having access to credit provides multiple benefits for small-scale farmers. These benefits include investing in the coffee plantations by buying the necessary inputs (e.g. organic/commercial fertilizer, seeds, coffee trees), and paying for the labor to maintain high productivity levels, which determines the quality and thus price of coffee. Additionally, credit can be used as a device to smooth household consumption and ensure an adequate food supply. Having a good food intake is critical for the family members who do the farm work. The ability of individuals to

properly maintain the coffee plantation depends, to a certain extent, on their level of nutrition.

Thirty-six percent of respondents advocated for the creation of a coalition between CVM farmers and the state government. According to the respondents, this coalition would have to be created with the intention of being sustainable and with the farmers' needs in mind. Access to credit at low interest rates, provision of inputs, transparent and democratic governing, large buying capacity, and strong trading relations that allow them to directly export their coffee are some of the characteristics they would like to see in the coalition.

Receiving higher prices for their coffee was identified by thirty-one percent of respondents as the third most important needed improvement. Higher prices at the farm-gate level directly provide farmers with higher income, which they can best allocate between farm and household expenses.

The Fair Trade Model (FTM)

Advantages

Having access to credit at low or no interest rates is the most important advantage identified by eighty-five percent of FTM respondents. The FTM cooperative uses three income sources to finance its operation and provide credit to its members. The sources are (1) importers who offer pre-financing, (2) several branches of FIRA-Banco de Mexico, which is the main financing source for agribusiness in Mexico and provides credit to the FTM cooperative, and (3) the members themselves who contribute a peso for each kilogram of coffee they sell to the cooperative. The "peso-per-kilo" was implemented first in 2003, but due to internal conflict it was cancelled for several years. The "peso-per-kilo" has currently been implemented for two consecutive years and it has become a source of loans with no interest.

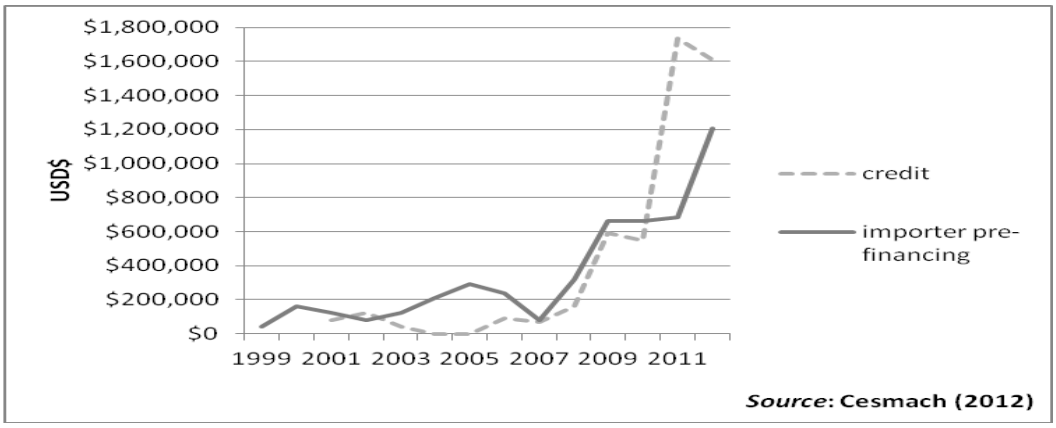


Figure 5.1 Internal Financing Sources for FTM Members

Figure 5.1 illustrates two of the three credit sources in the FTM cooperative. The credit and pre-financing available to the FTM cooperative has been steadily increasing as the cooperative established a trustworthy reputation over time. The FTM cooperative can successfully provide credit to its members because as an organized entity, it has better access to information about its members (e.g. credit history and re-payment intentions) and thus lower information costs than *coyotes* or banks. As any other cooperative, the FTM cooperative runs the risk of having members who do not sell their crop to the cooperative and default on their loan repayments. However, because being a member implicitly implies ownership of the cooperative, there is joint liability in which members who sell their crop and repay their loans are also liable for any un-paid loan. There are social sanctions on the defaulting farmer, affecting his/her reputation in the region as non-creditworthy. Moreover, the cooperative can also punish the defaulters by denying any future credit.

The second largest advantage identified by fifty-five percent of FTM participants is the higher and fixed prices they obtain when selling their coffee through the cooperative. Having access to government programs is the third largest advantage in the FTM. Being organized and legally registered legitimizes the FTM cooperative thereby granting the organization access to government programs that are not available to CVM farmers. One of the most important

identified government programs is the AMECAFE stipend that coffee growers obtain when they sell their coffee to registered buyers. As an organized entity, the FTM cooperative is able to use the pooled resources and pay the yearly USD$359.34 registration fee, allowing its members to claim the government stipend.

In addition to government stipends, organized groups also qualify for programs offered by private organizations. For example, the FTM cooperative was able to participate in a diversification program named “Passing on the Gift” implemented by Heifer International and Green Mountain Coffee. The intention of this program is to support coffee farmers during the “thin months” by diversifying their income sources. Each of the thirty-one communities in the FTM cooperative chose the animals and resources best suited to their specific needs. Examples include pigs, rabbits, sheep, fish, and honey. If a family is given two pigs, the family needs to raise the pigs and when they reproduce this family needs to “pass-on” two other pigs to another family in the village. Being able to qualify for and participate in these types of programs is an advantage for FTM farmers.

Practicing organic production is another advantage that thirty percent of the FTM respondents identified. Being able to produce organic coffee not only provides the members with an extra income (due to the USD$0.30 per pound organic differential), but also helps them support the environment. With equal significance to FTM respondents (23%), access to machinery and social premium are considered important. Many farmers do not have drying patios and must rent someone else’s patio to dry their coffee. FTM farmers have access to a drying patio located at the headquarters in Jaltenango. The cooperative, in collaboration with two other cooperatives, has a drying mill where member coffee is processed.

The fair trade social/price premium is also an important benefit FTM members receive. In

the FTM cooperative, the use of the social premium is democratically decided. Some of the past projects include organic production enhancement (e.g. training, internal control, replanting and organic certification), community projects (e.g. creating meeting facilities, improving the homes of farmers), equipment investment (e.g. purchasing freight trucks, scales, sacks), among others (see figure 5.2).

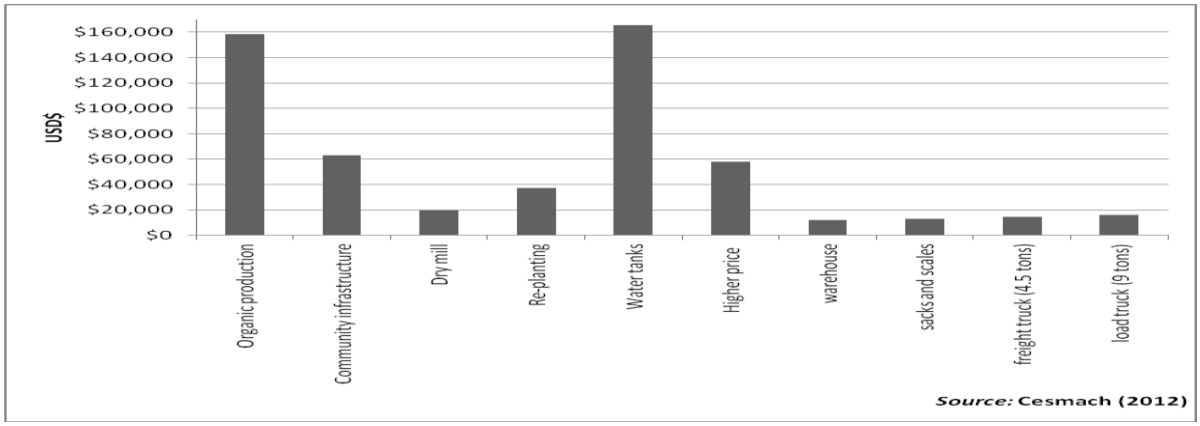


Figure 5.2 FTM Uses of Fair Trade Price Premium, 2003-2012

In accordance with the FLO's 2011 study, the FTM cooperative spent the majority of the fair trade price premium on business development, production and processing investments (refer to table 2.4).

Disadvantages

Eighteen percent of the respondents identified the payment installment system as a disadvantage. FTM members receive two payments, one at the beginning of the year when farmers sell their coffee to the cooperative and the residual payment during the 'thin months.' This residual payment is calculated after total revenue and total costs are taken into account, and as such, the residual payment depends on the level of profit earned by the cooperative. Despite the fact that eighteen percent of all respondents believe that paying in installments is a disadvantage, it is also true that an equal percentage of respondents believe that the installment plan has helped them

better administer their money throughout the year. And most importantly, the payment by installment system has provided members with the means of survival in the hardest months of the year when other farmers have exhausted their income sources and are compelled to request credit from "predatory" *coyotes*.

The second most mentioned disadvantage is the high commitment levels (e.g. time and cooperative sales commitment) that are demanded when participating in a cooperative. Farmers who hold staff positions in the cooperative complained about taking time away from farming to attend weekly meetings in their own communities, and monthly meetings in the Jaltenango headquarters. For delegates or community representatives there is a MXN$150.00 sanction if they miss the monthly meeting. Despite the fact that farmers with responsible roles receive a monetary "bonus" and community recognition, many farmers dislike the high commitment levels that characterize this well-organized cooperative.

The third most frequent disadvantage identified by five percent of all respondents is the fact that the FTM cooperative is very selective when buying coffee. The cooperative has a strong quality control system in place where random samples are taken from the farmers' coffee sacks and number of defects and humidity levels are meticulously examined. The members claim that in order to meet the FTM cooperative's quality standards, time and money investments (e.g. input and labor expenses) need to be made at the farm level. It is worth noting that forty-three percent of respondents did not identify any disadvantages in the FTM. This percent represent FTM respondents who truly believe their cooperative is working well and did not suggest any improvements.

Improvements

The most important improvements that FTM farmers suggested to enhance the benefits they obtain in the cooperative are (1) increasing the number of development projects at the cooperative and household levels, (2) maintaining high and/or increasing coffee prices, and (3) restructuring the cooperative in a productive way. Granted that past cooperative projects were successful in diversifying the farmers' production, improving the quality of their coffee and increasing their plantation productivity, all respondents (100%) advocated for the implementation of more projects. The respondents suggested the following development projects:

- a health clinic near the headquarters that all members can access at no cost or at a subsidized price
- a centralized nursery to increase quality control of the coffee trees and giving the trees at no costs to members
- upgrading the roofs of the members' homes to concrete to use them as drying patios
- buying collective land to increase the cooperative's hectares of coffee planted
- improving roasting and grinding for local market
- increasing the cooperative's physical capital (e.g. machinery)

Maintaining high or increasing coffee prices was the second most frequent suggested improvement in the FTM. In Jaltenango, the coffee market is highly competitive. There are seven fair trade coffee organizations and several multinational corporations such as AMSA, Café California, Expo Granos, Nestle and Starbucks in town. These multinational corporations are the biggest competition for the FTM cooperative because they can buy large quantities of coffee at once and pay with a cash payment. The ability of the FTM cooperative to offer higher coffee prices serves as an incentive for farmers' loyalty and willingness to stay with the cooperative.

A restructuring of the cooperative was the third most important improvement as a possible way to enhance the long-term benefits to the members. According to the respondents, some of the organizational improvements would provide better services specific for female-headed households, improve marketing techniques, marketing training for the board of directors,

strategic sales and financial planning, monetary compensation to members serving cooperative positions (e.g. board of directors, elected delegates) for the time they take off their farming activities to carry their responsibilities, and training at the farm level to improve production practices and thus increase productivity.

The Vertical Integration Model (VIM)

Advantages

For eighty-seven percent of respondents, the higher and fixed coffee price paid by the VIM cooperative is the largest benefit perceived by its members. In tune with vertical integration theory, which states that vertically integrated firms can obtain higher profits by reducing transaction costs and avoiding market failures, VIM members obtained higher coffee prices when selling to the cooperative than to local *coyotes*. As the cooperative owners, the members collectively set the coffee price to pay the cooperative members. As a rule of thumb, the cooperative's price is set so that it is *at least* MXN$100 per quintal above the price local *coyotes* offer in any given year.

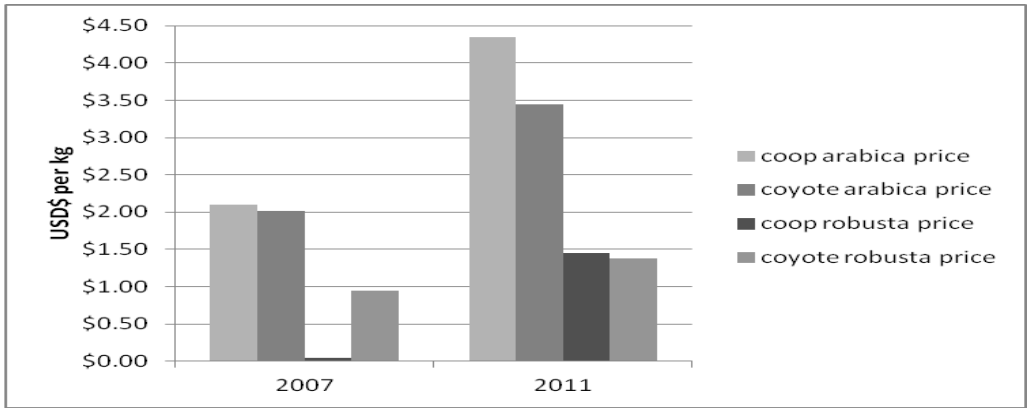


Figure 5.3 Average Arabica and Robusta Prices Paid to Farmers in the VIM

As figure 5.3 shows, VIM farmers received on average higher coffee prices when they sold to the cooperative than when they sold to *coyotes*. In contrast with the 2007/8 crop year, when differences in prices between the cooperative and *coyotes* were less pronounced, in the 2011/12

crop year the VIM cooperative was offering about USD$1.00 and USD$0.10 more per kilogram than *coyotes* for Arabica and Robusta coffee, respectively. Because higher prices for their coffee directly translates into higher revenues, VIM farmers place a high value on relatively high and stable coffee prices.

With forty-one percent of respondents, having health insurance is the second most valued advantage for VIM members. In order to receive health insurance from the cooperative, the members must (1) be *ejidatarios*, (2) sell a minimum of ten quintals per crop season, and (3) must not have health insurance from another source. Not all the members meet these requirements, and thus not all members receive health insurance benefits from the cooperative. The majority of VIM members who do not have a health insurance from the cooperative, however, have health insurance from other sources (e.g. health insurance through the government or the farmers' older children).

An unexpected benefit that thirty-one percent of VIM participants reported is the better management of their money that arises from the installment payment system used by the cooperative. VIM farmers believe that frequent but partial installment payments have forced them to better manage their money throughout the year and across farm and household expenses.

Disadvantages

Despite the fact that payment by installments can serve as a device to better manage income throughout the year, it is also perceived as a disadvantage by fifty-six percent of the respondents. During the first years of operation, the VIM cooperative did not have sufficient capital to pay its members at the point of sale (e.g. cash prompt payments), instead they were paid in three to four payments in a period of five to six months. As such, members struggled to pay for daily living expenses and make investments in the coffee plantations. In the past three years, the payment

frequency has improved and members are now receiving payments every 15-20 days. Frequent payments allow members to best allocate their income sources as they can use the first payments to cover immediate expenses and the later payments to smooth consumption and/or invest in their coffee plantation. When farmers are paid all their money at once, they run the risk of spending it all in a few months. That is, "it is easier to spend more money when you have it in your hands" (interview, 2012). In this sense, members like to be paid in installments, as long as they are frequent and constant.

The second largest identified disadvantage is the absence of credit provision and/or pre-financing in the VIM. Because not all VIM farmers receive health insurance benefits from the cooperative, thirteen percent of respondents identified the unequal distribution of health insurance benefits as the third largest disadvantage. And they suggested a monetary compensation for those members who do not receive the benefits equivalent to the amount (MXN$7,000) given to secured members to use for health related issues.

Improvements

The most frequent improvement suggested by seventy-nine percent of respondents was a restructuring of the cooperative to increase its competitiveness, and to encourage greater member involvement at all stages in the value chain. The suggested restructuring activities include:

- a strategic sales and marketing plan (targeting supermarkets in the US and increasing sales at the national level)
- a financing plan (look for potential financers)
- a production/productivity plan (increase production/productivity, create a centralized nursery to provide coffee trees to members, provide organic fertilizer)
- management training
- increase information flow at all stages in the value chain
- provide incentives for members to improve their commitment to the cooperative (especially when world coffee prices are high)
- provide annual reports of overall performance of the cooperative (e.g. costs, revenues)
- create financial statements and teach the members how to read them
- evaluation of staff to save overhead costs

The second most frequent improvement forty-six percent of VIM respondents recommended is the provision of credit and/or pre-financing through the cooperative. According the VIM respondents they would highly benefit if the cooperative would start providing credit and/or pre-financing to its members because they would not have to rely on local *coyotes* for credit, thereby not compromising part of their coffee production. VIM farmers would reduce their dependency on local *coyotes*.

The third largest suggested improvement is higher coffee prices. According to VIM respondents, higher coffee prices not only increase their household income, but it also gives them the advantage of having a cash flow to make investments in the coffee plantation and smooth household consumption.

Qualitative Analysis: External Evaluation on Each Value Chain

Table 5.3 illustrates the perceptions of cooperative members (FTM and VIM) and CVM coffee farmers about the conventional and cooperative trading regimes, respectively. This table captures the reasons that lead coffee farmers to join or not join a cooperative.

Table 5.3 Advantages and Disadvantages from Outside Viewers on Traditional and Alternative Coffee Trading Systems

Conventional Farmers' Perspectives on Cooperatives (n=39)				Cooperative Members' Perspective on Conventional Coffee Trading System (n=79)			
Advantages	**%**	**Disadvantages**	**%**	**Advantages**	**%**	**Disadvantages**	**%**
better price	49	payment installments	33	cash payment	30	fluctuating/low prices	65
credit	31	low member commitment	13	credit	20	no proof of sale	18
pooled resources	26	favoritism	8	non-selective coffee buying	8	conveniently-calibrated scales	16
economic services	18	low buying capacity	8	high price for quality coffee and/or large quantities	6	little/no credit	11
access to government programs	10	restrictive production practices	8	non-restrictive production practices	4	no control in value chain	6
direct exports	8	entry/entrance barriers	3	*none*	*16*	no access to machinery	4
none	*3*	must find their buyers/importers	3			no projects	1
						locked-in relationship	1

Conventional Farmers' Perspectives on the Cooperative Trading System

Advantages

According to forty-nine percent of CVM farmers, the higher price cooperative members receive for their coffee is the most important advantage they obtain when participating in the cooperative system. With thirty-one percent of respondents, CVM farmers perceive access to credit as the second largest advantage cooperative members receive, followed by their ability to use pooled resources. According to CVM farmers, pooled resources can enable organized farmers to acquire bargaining power even if they are not vertically integrated. Organized farmers can collectively sell large quantities of coffee to *coyotes* at once, and receive higher prices because they can reduce the *coyotes*' transaction costs of driving around the town buying small quantities from CVM farmers. In addition, organized farmers can also pool their income to buy the machinery necessary to process their coffee and thus increase its value. Getting organized, nevertheless, is a difficult task because of trust-building and commitment issues.

Disadvantages

One of the disadvantages conventional farmers perceive in the cooperative system is their installment payment system. Given that coffee farmers are risk averse and have challenges in gaining trust—due in part to their previous experiences with coffee buyers who offered good coffee prices by installments, paid the first installment and then ran away with the coffee without paying the rest of the money—being able to have a cash payment at the point of sale is crucial. Hence, thirty-three percent of conventional farmers identified payment by installments as a disadvantage.

The second largest perceived disadvantage is the low commitment of cooperative members. Conventional farmers dislike the tendency of some cooperative members to sell their

coffee to the cooperative only when market prices are relatively low and to the *coyote* when prices are high. In addition, conventional farmers have an aversion to the joint liability characteristic of cooperatives. A farmer in the CVM stated that "*en las coperativas pagan justos por pecadores*" (in cooperatives good people pay for the sins of others) when explaining how joint liability can hinder farmers. When cooperatives provide credit to its members and these members default, then the rest of members are liable for the defaulter's loan.

With eight percent of respondents, favoritism, low buying capacity, and restrictive production practices are other disadvantages perceived by conventional farmers of the cooperative system. Conventional farmers criticize the favoritism that exists in cooperatives when, for example, family and friends are preferred as members over other people in the community. Recruiting family and friends as new members has been a strategy used by many cooperatives to reduce problems such as adverse selection, moral hazard and free riding.

Low buying capacity is another perceived shortcoming of cooperatives. One of the difficulties that cooperatives (both fair trade and vertically integrated) face is that they have assumed the role of *coyotes* and must find the channels to market their coffee. Because establishing sustainable and direct trading relationships is a long-term process, many cooperatives with unstable markets cannot afford to buy the entire harvest of each of its members. The members must then sell the rest of their coffee through alternative channels at less favorable terms, a characteristic undesired by conventional farmers.

In addition, conventional farmers dislike the restrictive production practices present in the cooperative system. Acknowledging the environmental and economic benefits of organic coffee production, many cooperatives prohibit its members from using commercial fertilizers. Even though only ten and five percent of conventional farmers used commercial fertilizer in 2007/08

and 2011/12, respectively, conventional farmers still dislike the idea of not having complete control over their input use.

Cooperative Members' Perspectives on the Conventional Coffee Trading System

Advantages

According to cooperative members, the top three advantages that conventional coffee farmers have when selling to *coyotes* are (1) cash and prompt payments, (2) credit access, and (3) selling un-processed, un-cleaned coffee (e.g. non-selective coffee buying). The benefits farmers receive from these practices are the same as those explained in the previous sections. It is also important to note that sixteen percent of respondents do not see any advantage in the CVM.

Disadvantages

Sixty-five percent of cooperative members perceived fluctuating low coffee prices as the largest disadvantage conventional farmers face when selling their coffee through *coyotes*. The unwillingness of *coyotes* to provide a receipt (e.g. proof of sale) is the second largest disadvantages, identified by eighteen percent of cooperative farmers. With sixteen percent of cooperative farmers, using conveniently-calibrated scales is a disadvantage to which conventional farmers are subject. Again, the reasons for their perceived disadvantage have already been explained in previous sections and the same reasons apply here.

Chapter Six: Empirical Model and Results

Empirical model

The purpose of this study is to compare and contrast the economic welfare small-scale coffee farmers receive when participating in three coffee trading models—the conventional (CVM), fair trade (FTM), and vertically integrated (VIM) models. The study tests the hypothesis that VIM farmers are better off than FTM and CVM farmers because they have total control of their coffee from production to retailing. In addition, FTM farmers are expected to be better off than CVM farmers because they are formally organized (e.g. $H_0 : \beta_{VIM} > \beta_{FTM} > \beta_{CVM}$ against the alternative hypothesis $H_A \neq H_0$). The chapter is organized as follows. Dependent variables are described first, followed by the explanatory variables and the estimating techniques. The econometric results are explained last.

Dependent Variables

In order to measure the difference in welfare between the three groups, several proxies for wealth and income were used. These proxies include house size, number of rooms, number of vehicles, telephone ownership, coffee revenue and weighted coffee price. Initially, the purpose of the study was to measure the change in economic welfare from the 2007/08 to 2011/12 crop years to determine which of the three groups had a larger improvement in economic welfare during the five year period. However, because little or no change was found in the models from 2007/08 to 2011/12, the strategy became to measure the economic welfare of each group *at* a given year. Special focus was given to the current crop year of 2011/12. Although six proxies for wealth were modeled, only coffee revenue and weighted coffee price will be presented. The other explored models, their results, and generating techniques can be found in Appendix E.

Coffee Revenue

Coffee revenue was chosen as a dependent variable because it shows more explanatory power and represents a direct proxy for income with more than seventy-five percent of famers' total income coming from coffee in all three models. Coffee revenue (CR) was calculated as the coffee volume sold per household multiplied by the price received for that volume in a given year. The total coffee revenue includes the revenues the farmers obtained from selling Arabica and Robusta coffee to the cooperative and/or *coyotes*. The natural log of coffee revenue was taken to better simulate a normal distribution and to correct for skewness in the error distribution. The CR dependent variable is formulated as:

$$\ln (CR) = \ln [(P_{A\_coop}*Q_{A\_coop}) + (P_{R\_coop}*Q_{R\_coop}) + (P_{A\_coy}*Q_{A\_coy}) + (P_{R\_coy}*Q_{R\_coy})] \quad (6.1)$$

As equation 6.1 illustrates, when farmers sell both Arabica and Robusta coffee exclusively to the cooperative (Q_{A_coop}, Q_{R_coop}) or the *coyote* (Q_{A_coy}, Q_{A_coy}), some of the terms on the right hand side of the equation drop out. CVM farmers are the only group who sell exclusively to *coyotes*. Only thirteen percent of FTM farmers sold to *coyotes* in both the 2007/08 and 2011/12 coffee years, while farmers in the VIM relied heavily on *coyotes* to commercialize their Robusta (and to a lesser extent Arabica) coffee. In fact, about seventy-one and sixty-one percent of VIM farmer coffee revenue in the 2007/08 and 2011/12 coffee years, respectively, came from selling to *coyotes*.

In the VIM, the high level of coffee commercialization outside the cooperative was mainly driven by farmers who sold larger coffee volumes to *coyotes* than their cooperative (see figure E.1 for a detailed graph comparing VIM coffee revenue with and without revenue from *coyotes*). In fact, about ten percent of VIM farmers did not commercialize coffee through their cooperative in either the 2007/08 or 2011/12 coffee years, compared to only five percent in the FTM. When asked why they did not commercialize the coffee through their cooperative, VIM

farmers provided two complementary responses. The first, the farmers had already committed their harvest to local *coyotes* to whom they were indebted because of cash advances on their harvest. The second is the low production and productivity levels in 2011/12 which reduced the amount of coffee that could be sold to the cooperative (especially for *coyote* indebted farmers).

Table 6.1 presents descriptive statistics for coffee revenue. While all models showed an increase in the mean values from 2007/08 to 2011/12 due to higher coffee prices, the CVM illustrates the smallest increase. When focusing on one year at the time, the FTM has the largest mean, minimum and maximum values (with the exception of the 2007/08 VIM maximum value), followed by the VIM and then CVM. In 2011/12, the FTM minimum value was about seven and three times larger than that of CVM and VIM, respectively. In addition, while the maximum coffee revenue increased by twenty-nine and fifty-six percent from 2007/08 to 2011/12 in the CVM and FTM, respectively, this value decreased by forty-two percent in the VIM. The VIM maximum coffee values, however, were still larger than those of CVM in both 2007/08 and 2011/12.

Table 6.1 Descriptive Statistics: Coffee Revenue

		Mean	Median	Min	Max
CVM	2007/08	2,562	1,739	192	10,250
n=39	2011/12	3,658	2,815	174	13,174
FTM	2007/08	5,688	5,023	724	18,101
n=40	2011/12	8,623	8,694	1,304	28,257
VIM	2007/08	4,232	3,280	366	31,693
n=39	2011/12	5,370	4,182	445	18,354

These group means suggest that farmers in the FTM obtained, on average, more coffee revenue (e.g. income) than farmers in the other models. The larger coffee revenue in the FTM can be explained by the fact that FTM farmers (1) have larger coffee area, (2) commercialized more coffee through the cooperative (and thus receive higher prices), and (3) have higher productivity levels than CVM and VIM farmers. These results, however, need closer examination as there are

influencing factors that must to be controlled for. For example, including coffee revenue that comes from outside the cooperative—as in the VIM and to a lesser extent in the FTM that sold coffee to *coyotes*—can overestimate the impact of participating in the respective trading regime. Consequently, proper control variables must be specified in the empirical model to account for these and other factors.

Weighted Average Price

The second dependent variable, weighted average price, was used to account for the varying total coffee production levels across farmers and the price paid to the grower for each coffee variety (e.g. Arabica vs. Robusta). Accounting for coffee variety and specialization is important because having a larger proportion of a specific coffee variety with respect to the total coffee production can influence our understanding of the coffee economy in Chiapas. For example, while VIM farmers had, on average, higher coffee production levels than CVM and FTM farmers in the 2007/08 and 2011/12 coffee years, they produced more Robusta than Arabica coffee, thereby receiving a lower weighted average price for their coffee. Weighted price (WP) was calculated as:

$$\ln(WP) = \ln[(P_{A\_coop}*(Q_{A\_coop}/Q_T)) + (P_{R\_coop}*(Q_{R\_coop}/Q_T)) + (P_{A\_coy}*(Q_{A\_coy}/Q_T)) + (P_{R\_coy}*(Q_{R\_coy}/Q_T))] \quad (6.2)$$

Where Q_{A_coop}, Q_{A_coy}, Q_{R_coop}, and Q_{R_coy} represent the quantity of Arabica and Robusta coffee sold to the cooperative or *coyote*. P_{A_coop}, P_{A_coy}, P_{R_coop}, and P_{R_coy} are the prices paid by the cooperative or *coyote* for Arabica and Robusta coffee. Total coffee production, represented by Q_T, includes Arabica and Robusta coffee production sold to both buyers (e.g. $Q_T = Q_{A\_coop} + Q_{A\_coy} + Q_{R\_coop} + Q_{R\_coy}$).

Table 6.2 presents the descriptive statistics for weighted price. While the mean, median and minimum values followed a pattern in both 2007/08 and 2011/12—in which the FTM has

the largest values followed by VIM and CVM—the maximum values do not exhibit any specific pattern. In 2007/08, for example, the CVM had the largest maximum weighted price and VIM the smallest; this relationship switched (e.g. VIM had the largest maximum weighted price and CVM the smallest) in 2011/12.

Table 6.2 Descriptive Statistics: Weighted Average Price

		Mean	Median	Min	Max
CVM	2007/08	1.15	0.96	0.27	5.57
n=39	2011/12	1.80	1.53	1.21	3.73
FTM	2007/08	3.18	3.15	1.91	4.46
n=40	2011/12	3.75	3.78	3.25	3.81
VIM	2007/08	1.40	1.40	0.36	2.84
n=39	2011/12	2.16	1.87	1.39	4.34

In addition, while all three groups increase their average weighted price from 2007/08 to 2011/12 due to higher world coffee prices, VIM showed the biggest improvement followed by CVM. Although FTM showed the smallest weighted price improvement, FTM had, on average, the largest weighted price in both 2007/08 and 2011/12. These results, similar to the descriptive statistics of the CR model, suggest that FTM farmers are better off (e.g. have higher weighted price) than CVM and VIM farmers. CVM farmers are, on average, worse off in both the CR and WP models. The following sections describe the model and present the econometric results.

Explanatory Variables

Table 6.3 shows the explanatory variables used in the regression analysis and the effect (e.g. sign) these variables are expected to have on the farmers' economic welfare. Both age and age-squared (age and age^2) were introduced in the analysis to allow the effect of a one year increase in age to change as the farmers get older. Representing their functional form, the signs of age and age^2 are expected to be positive and negative respectively. That is, as farmers get older their economic welfare is expected to increase but at a decreasing rate.

Table 6.3 Explanatory Variables and Expected Signs

Variable	Expected Sign
constant	+/-
age	+
age^2	-
educ	+
female	+/-
coffee_ha	+/-
home_size	+/-
arabica_yld	+
coop_arabica	+
FTM	+
VIM	+
employment	+/-
business_owner	+/-

Education (educ), defined as the years of education completed, is expected to have a positive effect on economic welfare. Previous studies show that more educated farmers have higher unobserved managerial competencies and cognitive capacity that enable them to strategically make on- and off-farm decisions to improve their economic welfare (Marenya and Barret 2006). In addition, because education enhances the ability of farmers to receive, interpret and understand new information, educated farmers are more likely to adopt new technology and boost productivity (Nelson and Phelps 1966; Welch 1970; El-Osta and Morehart 1999).

The effect of gender, that is being a female household head, is ambiguous. Quisumbing (1996) showed that female-headed households are equally productive and receive the same prices as male-headed households when farming the same crop and selling through the same market channels as males, thus no differences in economic welfare can be expected between female and male household heads. Other scholars argue that there is gender inequality embedded in the production of a cash crop, such as coffee, in which the social norms dictate more male involvement in the decision making, production and sale practices of cash crops (Hill and Vigneri 2009). In addition, female-headed households have less access to assets (e.g. land, cash,

labor and inputs) and sale markets compared to males, which can undermine their ability to invest in the coffee plantation, mobilize the labor needed to carry out labor-intensive maintenance activities and to find advantageous marketing channels (Hill and Vigneri 2009). According to the *Consejo Mexicano del Café* or the Mexican Coffee Council (2001), female-headed coffee households in Chiapas, Mexico have less access to assets and are more time-constrained than males because in addition to working on the coffee plantation, they are in charge of food preparation and housekeeping activities.

The influence of coffee specialization (coffee_ha), measured by the hectares of coffee cultivated with respect to total productive land (e.g. farm size), is ambiguous. Coffee specialization can have a positive effect on the farmers' economic welfare to the extent that coffee production is a profitable practice, however full specialization can also increase the farmers' vulnerability to climatic and market shocks (Ruben, Fort and Zuniga 2010).

As a highly valued variety, Arabica coffee is an important source of income for many small-scale coffee farmers. Both Arabica coffee yield (arabica_yld) and the percentage of Arabica coffee sold to the cooperative (coop_arabica) are expected to have a positive effect on economic welfare. The coop_arabica variable is defined as the amount of Arabica coffee sold to the cooperative with respect to the total coffee production. Total coffee production includes the Arabica and Robusta coffee that is sold to the cooperative and *coyotes*. This variable is very important to the analysis because, as previously mentioned; commercializing coffee outside the specified trading regime significantly influences the price farmers receive for their coffee and thus their coffee revenues. Given that cooperatives offer higher coffee prices, selling Arabica coffee to the cooperative, instead of *coyotes*, is expected to have a positive effect on the farmers' economic welfare, holding other variables constant.

The size of the house (home_size), measured in squared meters, was used as a wealth indicator. Although other possible wealth indicators were explored, such as number of rooms, number of vehicles, telephone ownership, and house characteristics (e.g. roof and floor type, main source of electricity and water), home_size was chosen because in the studied regions the size of the house is positively correlated, in the minds of coffee producers, to household wealth. The sign of home_size is expected to be positive because households with greater wealth (e.g. larger homes) are expected to be better off than those with less wealth.

The variables of interest, FTM and VIM which represent the farmers' participation in a fair trade and vertically integrated cooperative are expected to have a positive effect on the farmers' economic welfare. Participating in cooperatives can yield a number of benefits to members, including higher and stable coffee prices, and increased access to public goods, credit, and bargaining power within and outside their households (McCarthy and Sun 2009). In addition, participation in cooperatives enables members to form and maintain reciprocal relationships that help build trust and social cohesion, and increase the flow of production and market-related information, and thus reduce transaction costs.

Provided that off-farm income can be an important source of income for many small-scale farmers, off-farm employment (employment) and business ownership (business-owner) were included in the analysis. The effect of these two off-farm income variables is ambiguous. Off-farm income can be a strategy for meeting subsistence needs, smooth household consumption, absorb shocks to agricultural income, and ease credit constraints (FAO 2007). In addition, off-farm income can increase the household capacity to purchase farm inputs and make investments to improve yield and labor productivity (McCarthy and Sun 2009). Farmers with off-farm income will not sell or harvest their crops before they are fully ripe for the purpose of

meeting urgent household cash needs (Angula 2010). On the other hand, off-farm income can have a negative effect on the farmers' economic welfare to the extent that off-farm wages are risky (e.g. unstable) and provide minimal increments of cash flow, and constitute a high opportunity cost of household labor (e.g. less available time to work on the farm).

Estimating Techniques

The coffee revenue (CR) and weighted average price (WP) econometric models were estimated using OLS. All models were tested for heteroskedasticity using White's General Test. No significant heteroskedasticity was found in any of the three models. The Variance Inflator Factor (VIF) was used to diagnose multicollinearity. As a rule of thumb, VIF values above ten are considered multicollinear. The percentage of Arabica coffee sold to the cooperative (coop_arabica) and being part of the fair trade cooperative (FTM) showed multicollinearity of 11.30 and 14.29, respectively. Further analysis showed a high correlation (ρ=0.90) between coop_arabica and FTM. This high correlation was influenced by FTM farmers who only produce Arabica coffee and sold most of their coffee production (e.g. 93% in 2007 and 97% in 2011) to the cooperative. These results suggest that coop_arabica and FTM/VIM capture the same effect.

To isolate the effects of coop_arabica and being part of the FTM and VIM cooperatives, three different models were estimated for both CR and WP. The first model, listed in table 6.4 as (1a) for CR and (2a) for WP, is estimated using all the explanatory variables (including coop_arabica and FTM/VIM) with 2007/08 and 2011/12 data. The purpose of estimating the same models for two different crop years was to illustrate possible changes led by macro factors (e.g. world coffee prices almost doubled from 2007/08 to 2011/12). Both the second and third models only use 2011/12 data. The second model, listed as (1b) for CR and (2b) for WP excludes coop_arabica and includes FTM/VIM. Listed as (1c) for CR and (2c) for WP, the third model

excludes FTM/VIM and includes coop_arabica.

The partial residual plots technique was used to detect nonlinearity in the parameters. Although the age variable exhibited nonlinear functional form in both the CR and WP models, the nonlinearity was only improved in the CR model by including an age^2 variable. Because no functional form was found in the WP model, the original age variable was kept in this model. In addition to age, other variables were found to be nonlinear in parameter, exhibiting multimodal functions. However, no fitted functional form was found as an improvement over linearity, thus their original form was kept. The Cook's D test and Outlier and Leverage Diagnose were used to spot outliers in each model. Removing outliers did not significantly improve the regression analysis so the total observations were kept.

Econometric Results

Table 6.4 presents the econometric results for both the CR and WP models. The independent variables in household characteristics will be explained first, followed by the series of variable portfolios including specialization, wealth, productivity, market, and off-farm income. While in general, the results of the CR model will be explained first and then the WP results, there will be cases were the CR and WP results will be explained simultaneously.

Household Characteristics

In the CR model, age and age^2 have the expected signs and (with the exception of the 2007/08 model) are statistically significant at the one and five percent level. The age effect indicates that coffee revenue increases with age, but at a decreasing rate. As people get older, their coffee revenue increases perhaps because they have gained experience in coffee production techniques, but there is a threshold, in which further increases in age would decrease coffee revenue as farmers are less able to perform the tasks that they performed before.

Table 6.4 Ordinary Least Squares Estimation: Coffee Revenue and Weighted Price

Dependent variable	Log of Coffee Revenue (CR)								Log of Weighted Price (WP)							
Models	(1a)				(1b)		(1c)		(2a)				(2b)		(2c)	
	2007/08		2011/12		2011/12		2011/12		2007/08		2011/12		2011/12		2011/12	
Independent variables	**Beta**	**s.e.**	**Beta**	**s.e.**	**Beta**	**s.e.**	**Beta**	**s.e.**	**Beta**	**s.e.**	**Beta**	**s.e.**	**Beta**	**s.e.**	**Beta**	**s.e.**
constant	5.107***	0.649	5.963***	0.619	6.022***	0.621	6.339***	0.657	-0.316	0.197	0.471***	0.116	0.419**	0.138	0.425**	0.108
age	0.042*	0.022	0.054**	0.021	0.053**	0.021	0.049*	0.021	0.0003	0.003	0.001	0.002	0.001	0.002	0.001	0.001
age^2	-0.0003	0.000	-0.0005**	0.000	-0.0005**	0.000	-0.0005**	0.000								
educ	0.053**	0.021	0.042*	0.018	0.043*	0.018	0.040*	0.020	-0.007	0.009	-0.008	0.006	-0.010	0.007	-0.007	0.006
female	-0.339+	0.206	-0.419*	0.213	-0.408+	0.214	-0.464*	0.227	-0.002	0.089	-0.071	0.064	-0.086	0.067	-0.069	0.062
coffee_ha	0.534*	0.262	0.405+	0.245	0.370	0.253	0.327	0.258	0.379**	0.136	0.073	0.072	0.125	0.088	0.089	0.070
home_size	0.0003	0.000	0.0004+	0.000	0.0004+	0.000	0.0004	0.000	-0.0001	0.000	-0.00003	0.000	-0.00002	0.000	-0.00002	0.000
arabica_yld	0.001***	0.000	0.001**	0.000	0.001**	0.000	0.001**	0.000	0.0001	0.000	0.0001	0.000	0.0001*	0.000	0.0001	0.000
coop_arabica	-0.300	0.326	-0.649	0.532			0.394+	0.227	0.200	0.213	0.971***	0.102			0.809***	0.054
FTM	1.034**	0.369	1.220*	0.516	0.608**	0.214			1.021***	0.239	-0.181	0.117	0.734***	0.067		
VIM	0.410*	0.197	0.344+	0.188	0.216	0.157			0.211	0.130	-0.022	0.057	0.169**	0.064		
employment	-0.061	0.190	-0.206	0.204	-0.186	0.207	-0.176	0.215	0.010	0.104	-0.059*	0.028	-0.087**	0.033	-0.064**	0.027
business_owner	-0.173	0.203	0.127	0.171	0.161	0.177	0.161	0.182	-0.075	0.142	0.129+	0.074	0.080	0.080	0.123+	0.074
N	118		118		118		118		118		118		118		118	
R^2	0.4103		0.4225		0.4126		0.3893		0.6432		0.7885		0.6935		0.7850	
F-statistic	6.09***		6.40***		6.77***		6.82***		17.37***		35.92***		24.21***		43.82***	

*** Significant at <.01% level
** Significant at 1% level
*Significant at 5% level
+ Significant at 10% level

In many cases as farmers get older they have to pay someone to maintain their coffee plantation. In addition, after the threshold, older farmers may be less willing to learn new production techniques and/or adopt technology that can potentially increase productivity.

The age effect in the WP model is positive across all three models. In the 2011/12 WP models, for example, as farmers get older (e.g. an additional year of age), the coffee weighted price they receive increased by 0.1 percent, holding other things constant. As farmers get older, they can establish stronger trade relationships with coffee buyers (e.g. *coyotes* and/or cooperatives) based on trust and commitment that can allow them to obtain higher coffee prices than farmers without these trade relationships. That is, as farmers get older, they increase their social capital. This effect is, however, not statistically significant across WP models.

While education (educ) has a positive and statistically significant effect across CR models, educ is negative and statistically insignificant in all WP models. The unexpected negative effect of education on weighted price can perhaps be caused by an indirect effect. McCarthy and Sun (2009) found that education, which they proxied as experience, increased off-farm employment as greater knowledge was relatively more valuable outside the farm. Having an off-farm job can reduce the available time to perform farming activities potentially decreasing coffee quality and thus coffee prices.

Female-headed household negatively affects economic welfare across the CR and WP models. This effect is only significant at a five and ten percent level in the CR models, but it is insignificant in all WP models. The primary reason for female-headed households to negatively influence economic welfare is the challenge they have to carry out labor-intensive maintenance activities and/or the need to pay someone else to perform these activities. Coffee production, yield, quality and thus the price received for the coffee highly depends on properly maintaining

the coffee plantations throughout the year; inadequate maintenance can decrease farmers' economic welfare. Although there are coffee production activities females can adequately perform (e.g. weeding, land preparation, planting, harvesting, washing and drying coffee beans) there are other tasks that are difficult or impossible for female farmers. The banana trees used for shade in coffee plantations grow tall and must be pruned with machetes on a regular basis to allow some sunlight through to the coffee plants. This, according to interviewed female farmers, is a challenging task given their height. In addition, because most coffee plantations are located in steep mountains with no road access, during the harvesting season farmers must carry the 57.5 kg sacks of coffee on their backs. Carrying coffee sacks on their backs is almost an impossible task for the average female from Chiapas. Consequently, many female farmers must hire labor to maintain the coffee plantation (e.g. pruning shade trees) throughout the year and during the harvest season.

Coffee Specialization

The percentage of total hectares cultivated with coffee (coffee_ha) has a positive sign across CR and WP models. In the CR model, the coffee_ha effect is statistically significant at a five and ten percent level in the (1a) model and insignificant in the (1b) and (1c) models. In the WP model, this effect is only statistically significant in the 2007/08 (2a) model at a five percent level. The positive effect indicates that economic welfare increases as farmers plant an additional hectare of the total productive land with coffee instead of cultivating basic crops, other cash crops or not cultivating at all. That is, specializing in coffee production has a positive effect on the economic welfare of small-scale farmers, holding other things constant. Although coffee specialization can increase the farmers' vulnerability to climatic and market shocks, the positive effect reflects the high world coffee prices in 2007/08 and 2011/12, which makes coffee specialization profitable.

Wealth Indicator

The wealth indicator, the size of the house, is positive and significant at a ten percent level in the 2011/12 (1a) and (1b) CR models. This effect is negative and insignificant across WP models. In both the CR and WP models, the magnitude of the effect of house size on economic welfare is relatively small.

Productivity

As expected, Arabica yield (arabica_yld) postively and significantly influences economic welfare in all CR models. A one unit increase in arabica yield increased coffee revenues by 0.1 percent across CR models, *ceteris paribus*. In the WP model, arabica_yld is positive and only statistically significant in the 2007/08 (2a) model. Because yield is a measurement of the amount of coffee that was harvested per unit of land area (e.g. kilos per hectare), yield indirectly represents the level of farm investment and management intensity. Thus, the positive influence of arabica_yld on the farmers' economic welfare can represent the farmers' intensity of production.

Market

The percentage of Arabica coffee sold to the cooperative (coop_arabica) exhibits mixed results in the CR and WP models. In the CR (1a) model, coop_arabica has a negative but insignificant effect on coffee revenue. This unexpected result is highly influenced by FTM farmers who only produce Arabica coffee and sold most of their coffee to the cooperative. The CR (1c) model isolates the coop_arabica effect by removing the effects of participating in a fair trade cooperative (FTM) and in a vertically integrated cooperative (VIM). When isolated, the effect of selling Arabica coffee to the cooperative becomes positive and significant at a ten percent level. For every additional unit of Arabica coffee commercialized through the cooperative, farmers' coffee revenue increased by thirty-nine percent, holding other things constant.

Contrasting the results of the CR (1a) model, the coop_arabica effect is positive in the all WP models. Weighting price by total coffee production gives the expected positive effect of coop_arabica on the farmers' economic welfare. When FTM and VIM are removed, the arabica_yld effect is positive and statistically significant. That is, farmers' economic welfare (e.g. weighted price) increased by eighty-one percent more when farmers sold Arabica coffee to the cooperative than when they sold to *coyotes*, all else equal.

Participating in a fair trade (FTM) and vertically integrated (VIM) cooperative has the expected positive effect on farmers' economic welfare in the CR models. While both the FTM and VIM effects are statistically significant in the (1a) model, once coop_arabica is removed the VIM effect becomes insignificant, highlighting the high correlation between coop_arabica and FTM. In the CR (1b) model, for example, the coffee revenue of farmers participating in the fair trade cooperative was sixty-one percent higher than non-affiliated CVM farmers, holding other things constant. This effect is statistically significant at a one percent level. In addition, the coffee revenue of farmers in the vertically integrated cooperative (VIM) was larger by twenty-two percent more than that of CVM farmers, all else equal, although this effect is statistically insignificant.

Contrasting the CR model results, the FTM and VIM effects in the WP (2a) model changed from positive in 2007/08 to negative in 2011/12 when coop_arabica is in the estimation. With the exception of the FTM effect in the 2007/08 (2a) model, the effects are not statistically significant. The change in sign from 2007/08 to 2011/12 could reflect the common assumption that participating in organized groups is less beneficial when world coffee prices are high than when prices are low. In this model, however, the negative FTM and VIM effects seem to be driven by the coop_arabica variable, which as previously mentioned captures the same effect.

When coop_arabica is removed, both the FTM and VIM effects become positive and highly statistically significant. That is, the coffee weighted price (e.g. economic welfare) of FTM farmers increased by seventy-three percent more than that of CVM farmers, holding other things constant. In addition, the economic welfare of VIM farmers was seventeen percent higher than that of CVM farmers, all else equal.

When the FTM and VIM effects are isolated and a two-tail F-test is used to test for statistically differences between the effects (e.g. H_0: $\beta_{VIM} = \beta_{FTM}$ against $H_A \neq H_0$), it can be concluded that FTM farmers are better off (e.g. coffee revenue and coffee weighted price) than VIM farmers at p-values of 0.118 and 0.0002 in the CR and WP models, respectively. Consequently, the null hypothesis that H_0: $\beta_{VIM} > \beta_{FTM} > \beta_{CVM}$ is rejected. Although VIM and FTM farmers are both better off than CVM farmers, the results indicate that farmers in the FTM, and not the VIM, benefit the most from participating in a cooperative.

The lower magnitude of the VIM effect and insignificance, compared to the FTM effect, can be explained by two main factors. First, VIM farmers commercialized less coffee through their cooperative reducing their ability to obtain higher coffee prices and thus economic welfare. In 2011/12, for example, while VIM farmers sold about twenty-seven percent of their total coffee production to their cooperative, FTM farmers commercialized ninety-seven percent of their total coffee production through their cooperative. Second, FTM farmers have a geographical comparative advantage over VIM farmers. FTM coffee plantations are located at higher elevations than those in the VIM, allowing FTM farmers to specialize on high-valued Arabica coffee production and hence obtain higher economic benefits. In 2011/12, while 100 percent of FTM farmers' coffee production was Arabica, only seventeen percent of VIM farmers' coffee production was Arabica. In addition, having their coffee plantations in the buffer zone of El

Triunfo natural reserve present FTM farmers with multiple benefits including (1) diverse vegetation that can prevent soil erosion and help maintain/increase crop yield, (2) qualification to apply for government programs and/or programs from private national/multinational organizations that target environmental conservation, and (3) symbolic marketing in which eco-friendly labels can be strategically used when commercializing the coffee.

Off-farm Income

The effect of off-farm employment is generally negative across both the CR and WP models (with the exception of the 2007/08 WP model). The effect is statistically significant at a one and five percent level in only the 2011/12 WP models. In the WP (2b) model, for example, the weighted price (e.g. economic welfare) of farmers who had a job outside the farm decreased by nine percent more than farmers who did not hold an off-farm job, all else equal. Off-farm employment negatively influences the farmers' economic welfare as measured by CR and WP because having an off-farm job entails opportunity costs associated with having less time to work in the coffee plantation. Investing less time in the coffee plantation can translate into lower coffee production, yield and quality, all of which reduce economic welfare.

While being a business owner in 2007/08 negatively influenced economic welfare, this effect was positive in 2011/12 across CR and WP models. The effect of having a business was only significant at a ten percent level in two of the WP models. Because running a business requires managerial skills, farmers who own a business are assumed to have higher unobserved managerial competencies that can enable them to increase their income. Increased income allows farmers to invest in their coffee plantation, and increase productivity and coffee quality. In addition, higher income can prevent farmers from harvesting and selling unripe coffee beans for two reasons. First, they have no immediate cash need. Secondly, they are less vulnerable to the

actions of unemployed youth who might steal their coffee, a common practice in Urbina and El Aguila. The extra income farmers obtain from their businesses can allow farmers to hire someone to patrol their coffee plantations and avoid their coffee from being stolen.

Chapter Seven: Conclusion

As the fourth most tradable commodity and the main source of income for twenty-five million farmers and workers in the world, coffee markets have become a compelling area of study. In particular, recent studies have focused on the benefits small-scale coffee farmers receive when they participate in alternative coffee trading systems, such as the fair trade and organic markets. Although there are multiple qualitative studies that assess the impact of alternative coffee trading systems, empirical studies that use quantitative methods to measure this impact are limited.

Using a mixed-method approach, where both qualitative and quantitative data was collected through semi-structured interviews, participant observation, and a household survey, this study provides new empirical evidence on the welfare effect that participating in different coffee trading systems have on small-scale coffee farmers in Chiapas, Mexico. While most studies compare and contrast the economic welfare of small-scale coffee farmers in the fair trade or organic markets with non-aligned independent farmers (e.g. fair trade vs. conventional or organic vs. conventional), this study measures the economic welfare of farmers who sell their coffee through conventional (CVM), fair trade (FTM) and vertically integrated (VIM) coffee trading systems. Including a vertically integrated cooperative to the analysis is a contribution to existing literature on coffee trading systems that adds to our understanding of the coffee industry in Chiapas, Mexico.

One key finding reveals that farmers organized into cooperatives are better off than non-aligned independent farmers. Despite the fact that the study was done during a period of high world coffee prices and thus everyone is expected to be better off, organized farmers were better off than non-aligned farmers (CVM farmers). The qualitative results indicate that being organized into cooperatives benefited farmers in multiple ways. The most important benefits,

that both FTM and VIM farmers obtained, include higher and stable coffee prices and access to programs from government and private organizations. Because VIM farmers are vertically integrated, they decide, upon covering costs of production and operation, how much to pay themselves. VIM farmers set the coffee price always above local *coyotes*. As a fair trade principle, FTM farmers get paid a price that is always above the market price by at least the amount of the price premium (USD$0.20). CVM farmers, on the other hand, must take the price offered by *coyotes* which is often times lower than the actual market price.

When farmers are organized into registered cooperatives, they become legitimate coffee farmers in the eyes of the government and private organizations, allowing them to receive monetary support and coffee productivity and diversification training. In addition, when coffee farmers are part of cooperatives they gain management skills. Both the FTM and VIM cooperatives are organized democratically where members are equally likely to assume leadership positions. When farmers take leadership positions they gain multiple managerial skills ranging from record-keeping to supervision practices.

Although getting paid in installments is a perceived disadvantage for organized farmers, it has also helped farmers to better administer their coffee revenue throughout the year. It is easier for farmers to spend all of their coffee revenue faster when they get one payment at the beginning of the year, increasing their probability of borrowing from local *coyotes*. If payments are consistent and frequent, getting paid in installments, salary-like, can serve as mechanism for organized farmers to decrease the need for credit from *coyotes* at high interest. Credit plays an important role for FTM farmers. The qualitative data shows that FTM farmers benefit greatly from having access to credit at low interest rates as it serves as an income smoothing device. Because VIM farmers do not have access to credit through their cooperative and rely on local

coyotes for credit, they would highly benefit from receiving credit from the cooperative.

A positive externality that arose from being organized into cooperatives is the increasing interest from outsiders. In the FTM, many master and doctoral students have focused their theses/dissertations on the cooperative. The increasing interest of academics has provided the cooperative with written documents that enhance the understanding of different aspects of the cooperative (e.g. history, structural structure, coffee quality), and it indirectly promotes the cooperative's coffee. Coffee travel delegations provide VIM farmers with economic support and international networks, who serve as advocates for their coffee in Northern markets and help expand the sales of the cooperative's coffee.

Another important finding is that FTM farmers, and not VIM farmers as initially hypothesized, enjoy the greatest economic benefits of the three groups. There are three major factors that contribute to this result. First, the FTM cooperative was established a decade earlier than the VIM cooperative. While both the FTM and VIM cooperatives were founded when world coffee prices dropped to record lows (USD$0.53 in 1992 and USD$0.48 in 2002), the ten-year gap that exists between their founding contributes to significant differences between the two cooperatives. The FTM cooperative has a larger membership base that allows the cooperative to sell larger volumes of coffee and have economies of scale. Being established a decade earlier has allowed the FTM cooperative to established solid relationships with fair trade importers, increasing pre-financing, coffee sales and its capacity to buy larger quantity of coffee from its members. Having the capacity to buy large quantities of the members' coffee production is critical in determining the economic welfare of FTM farmers. In 2011/12, while FTM farmers commercialized ninety-seven percent of their total coffee production through their cooperative, VIM farmers sold about twenty-seven percent of their total coffee production to their

cooperative.

Second, the VIM cooperative mostly buys Arabica coffee from the members, which represents a small proportion of the members' total coffee production. In the 2011/12 coffee year, Arabica coffee accounted for thirty percent of the members' total coffee production with the remaining seventy percent being Robusta coffee. Although the cooperative began buying Robusta coffee from each of its members in the 2011/12 coffee year, the Robusta sold to the cooperative was only thirteen percent of the members' total Robusta production. When VIM farmers cannot sell all of their coffee production through the cooperative at higher prices, they are forced to sell to local *coyotes* at lower prices. Consequently, increasing the VIM cooperative's coffee buying capacity for both Arabica and Robusta coffee can increase the farmers' economic welfare.

The third contributing factor to the larger economic welfare in the FTM is the geographical comparative advantage that FTM farmers have over VIM farmers. FTM coffee plantations are located in the buffer zone of El Triunfo Biosphere Reserve at altitudes optimal for high-valued Arabica coffee production and with diverse vegetation that can prevent soil erosion and help maintain/increase crop yield. In addition, having their coffee farms in a natural reserve enables FTM farmers to qualify for programs that target environmental conservation, and allows them to strategically market their coffee as eco-friendly.

Another important finding from the econometric analysis is the negative influence being a female-headed household has on coffee revenue. Although gender equality is an issue that is of interest to the cooperative movement, especially in the fair trade system where gender equality is a requirement in the FLO standards, female-headed households had lower economic welfare than male-headed households. This finding mainly points to the fact that female-headed households

experience difficulties in carrying out labor-intensive maintenance activities (e.g. pruning, carry coffee sacks during the harvesting season), and/or in paying someone else to perform these activities. In addition, female-headed households are more time constrained because, in addition to working on the coffee plantation, they have to perform food preparation and housekeeping activities. Future research should be directed to closely examine the role of female-headed households and to test whether or not there are structural gender inequalities in coffee farming and within the cooperative system. Can alliances with government programs and/or national and transnational corporations that target specific needs for coffee female-headed households be potential means for female farmers to obtain a higher economic welfare?

Because this study was based on a small data set of 118 observations across two years, future research should include a larger panel data set with more observations across multiple years. In addition, the data set should include observations from a wider range of coffee growing regions in Chiapas, Mexico. In the study, the non-aligned conventional farmers (CVM farmers) were from the same region as the VIM farmers, limiting the comparing and contrasting characteristics of CVM and FTM farmers. Further research should include conventional farmers from the FTM region.

Policies directed to improve the economic welfare of small-scale coffee farmers and to create sustainable development in rural coffee growing regions must emphasize the need for farmers to be organized into legally registered groups (or cooperatives) because registration legitimizes the farmers, enabling them to obtain economic and capacity building support from the government and other organizations. In addition, policies should focus on the provision of affordable credit to small-scale coffee farmers. Having access to credit at low interest rates is critical for coffee farmers to smooth household consumption, invest in the coffee plantation and

finance family emergencies. When small-scale farmers do not have access to affordable credit, they are forced to borrow from *coyotes* at high interest rates year after year, falling into a poverty trap from which they cannot easily escape. Creating alliances between small-scale coffee cooperatives, the Mexican government and national/multinational financing institutions through a system of joint liability and subsidized credit can possibly increase the available credit to small-scale coffee farmers and thus enhance their economic welfare. Lastly, policies should be directed at improving income generation in female-headed households.

APPENDICES

Appendix A

Table A.1 Coffee-Producing Countries by Principal Type and Region

Milds	*Natural Arabicas*	*Robustas*
Colombia Milds	**All Natural Arabicas**	**American Robustas**
Colombia	Brazil	Brazil
Kenya	Ecuador	Ecuador
Tanzania	Paraguay	Trinidad and Tobago
	Yemen	
American Milds		**Asian Robustas**
Bolivia		India
Costa Rica		Indonesia
Cuba		Lao PDR
Dominican Republic		Malaysia
Ecuador		Philippines
El Salvador		Sri Lanka
Guatemala		Thailand
Haiti		Vietnam
Honduras		African Robustas
Jamaica		Angola
Mexico		Benin
Nicaragua		Cameroon
Panama		Central African Republic
Peru		DR Congo
Venenzuela		Equatorial Guinea
United States (PR and HI)		Gabon
		Ghana
African Milds		Guinea
Burundi		Liberia
Cameroon		Madagascar
DR Congo		Nigeria
Madagascar		Togo
Malawi		Sierra Leone
Nigeria		Tanzania
Zambia		Uganda
Zimbabwe		
Asian Milds		
India		
Indonesia		
Papa New Guinea		

Source: Lewin, Giovannucci and Varangis 2004

Table A.2 Difference Between Arabica and Robusta Varieties

	Arabica	**Robusta**
Green bean		
Chromosomes (2n)	44	22
Time from flower to ripe cherry	9 months	10-11 months
Flowering	After rain	Irregular
Yield (kg beans/ha)	1500-3000	2300-4000
Root system	Deep	Shallow
Soil requirements	Fertile soil	Poorer soil
Temperature requirements	Moderate	More heat tolerant, more sensitive to cold
Optimum temperature (yearly average)	15-24° C	24-30° C
Optimal rainfall	1500-2000 mm	2000-3000 mm
Optimum altitude for growth	1000-2000 m	0-700 m
Hemileia vastatrix (Coffee rust)	Susceptible	Resistant
Nematodes	Susceptible	Resistant
Tracheomycosis (Coffee wilt disease)	Resistant	Susceptible
Coffee berry disease	Susceptible	Resistant
Caffeine content of beans	0.8-1.4%	1.7-4.0%
Shape of bean	Flat	Oval
Typical brew characteristics	Acid, fuller flavor	Bitter, weaker flavor
Body	Average = 1.2%	Average = 2.0%

Source: Food and Agriculture Organization of United Nations 2012

Appendix B

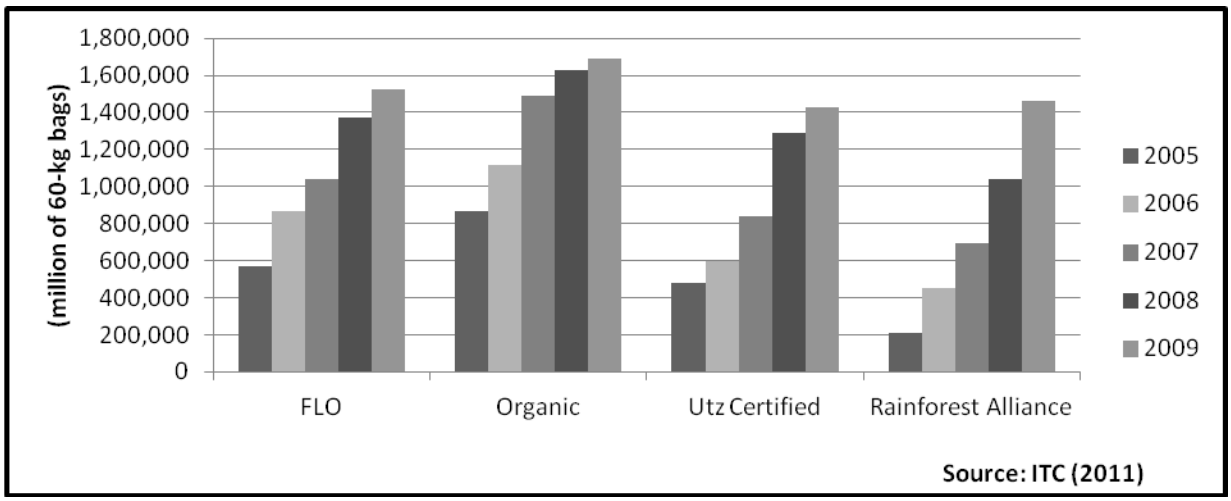


Figure B.1 World sales of certified or verified coffee by seal

Appendix C

Table C.1 Percentage of People by Social Deprivation Indicator in Chiapas, Mexico, 2008*

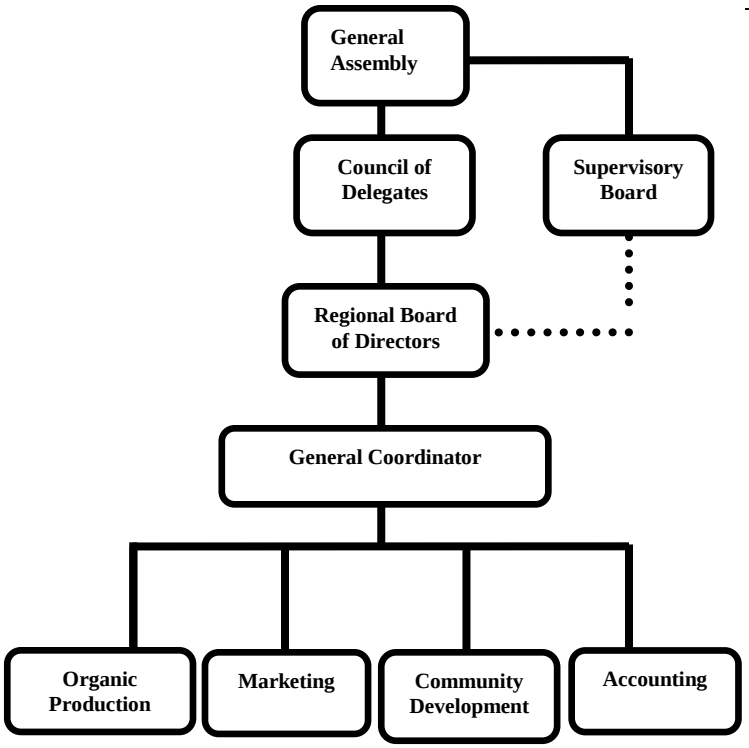
Social Deprivation Indicator	Access to Education	Access to healthcare	Access to health insurance	Housing quality and spaces	Basic services in homes	Access to food
Chiapas	37.8	52.1	85.3	38.2	36.3	26.3
National	21.7	40.7	64.7	17.5	18.9	21.6

Source: CONEVAL (2009)

* Social Deprivation Indicators are measured by the percentage of people who do not have access to the identified social indicators.

Appendix D

Table D.1 Cesmach's Organizational Structure



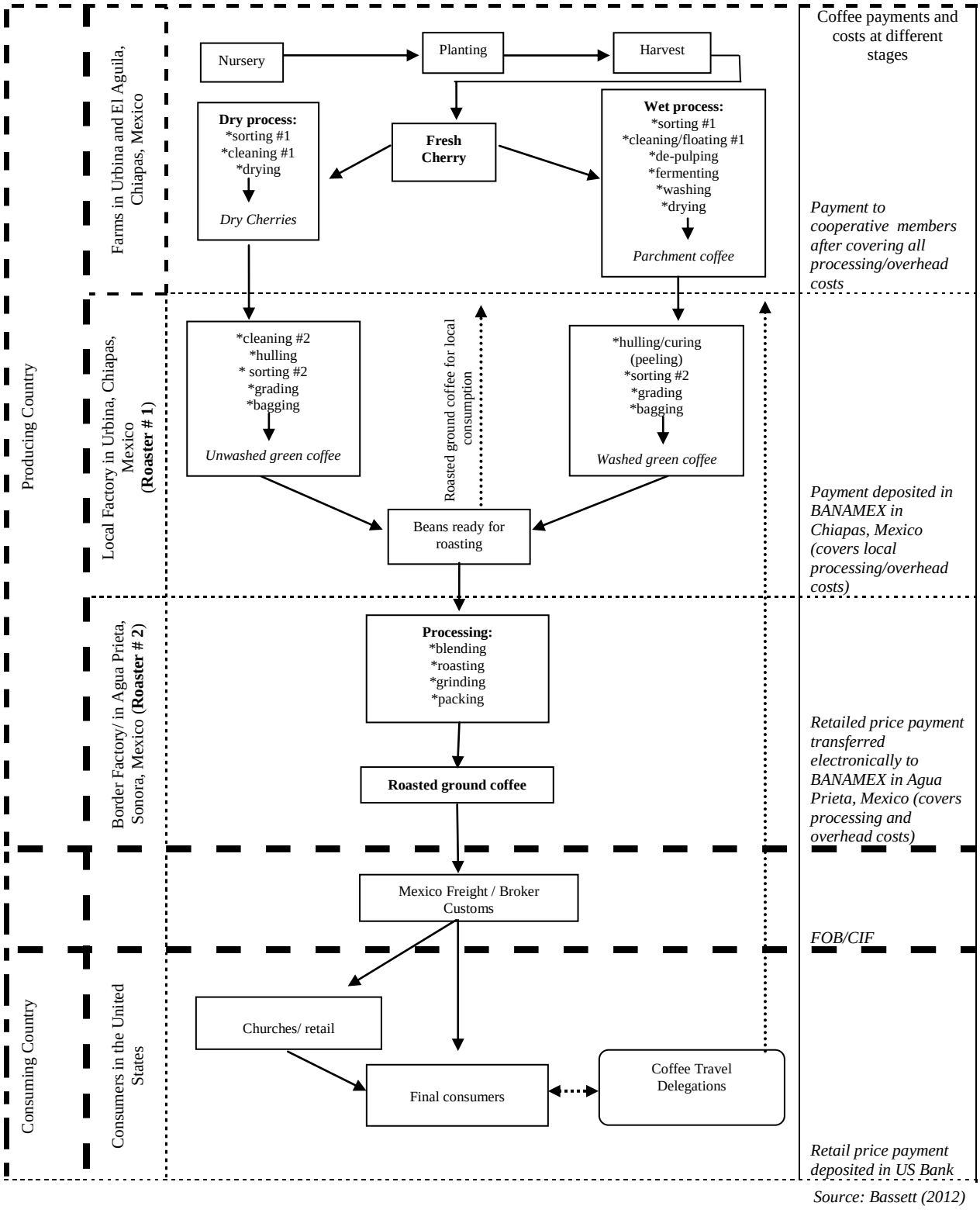
Area	Responsibility
General Assembly	Meets annually to analyze annual reports and work program. All 478 members must attend this meeting because the most important decisions are taken here.
Council of Delegates	Meets monthly to follow up on the work program and takes part in decision making. It consists of a representative (the same as the spokes person in the regional board of directors) from each of the 31 communities.
Regional Board of Directors	Consists of a president, secretary, spokes person who meet monthly to follow up on the work program and takes part in decision making.
Supervisory Board	Supervises the work of the board of directors and oversees the decisions made at the General Assembly.
General Coordinator	Assists with the implementation of the work program and business plan, strategic alliances, propaganda and marketing, and the performance of operating personnel.
Organic Production	Takes care of organic certification, equipment resource availability, training, technical assistance and on-farm quality control.
Marketing	In charge of promotion, gathering of coffee from members, milling process, sells, services, strategic alliances, savings and financing.
Accounting	Documents revenues and expenses, and compliances with the tax provisions.
Community Development	Takes care of projects outside coffee, such as the supply store project and women's program.

Source: Cesmach (2012)

Soconusco Region in Chiapas Mexico

Source: www.travelchiapas.com

Figure D.2 The Soconusco Region in Chiapas, Mexico



Source: Bassett (2012)

Figure D.3 Café Justo's Value Chain

Appendix E

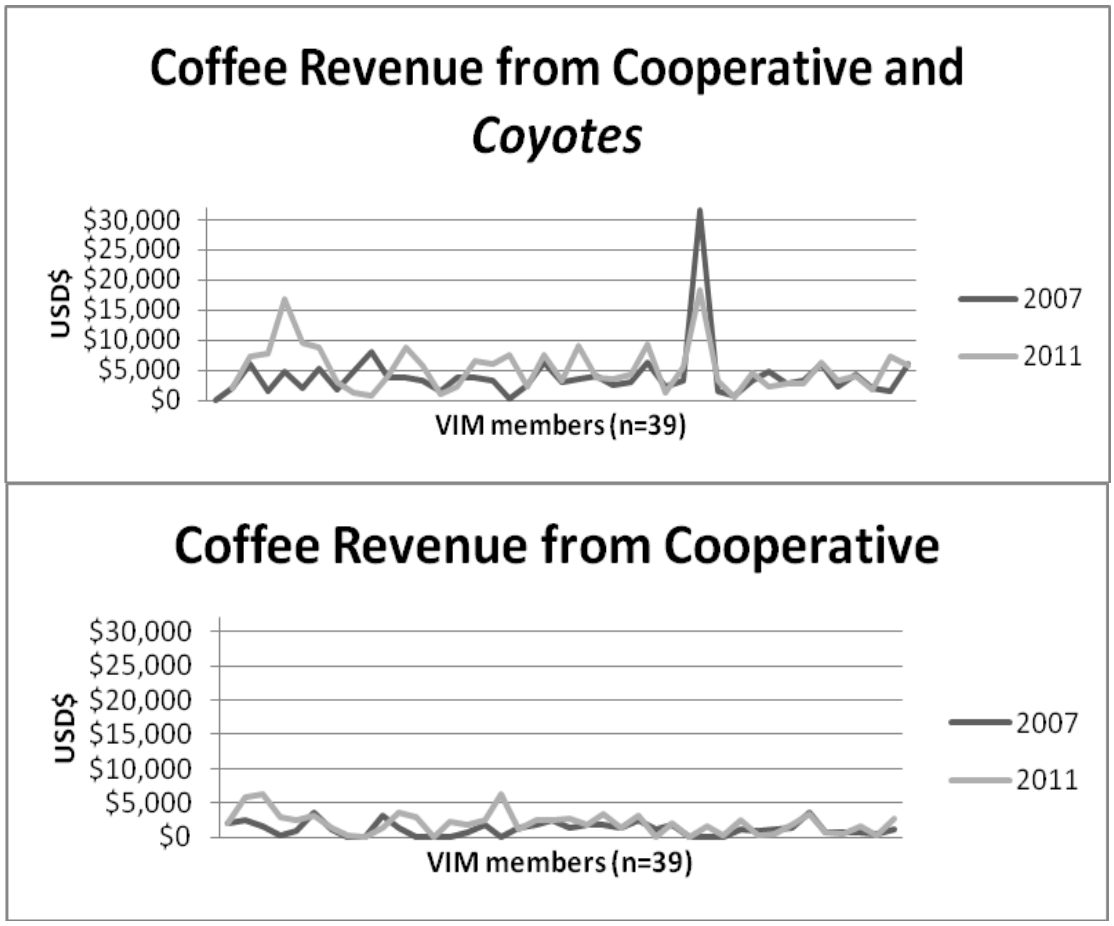


Figure E.1 VIM's Coffee Revenue Distribution Across Members

As figure E.1 illustrates there are two spikes that significantly influenced the total coffee revenue in the VIM. The first spike was caused by a farmer who obtained eighty-two percent of his total coffee revenue from selling to a *coyote* in the 2011/12 crop year. The second spike was influenced by a farmer who sold only about 0.28% of its total coffee production in the 2007/08 crop year and did not sell to the cooperative in 2011/12.

Table E.1 Explored Dependent Variables

Dependent variable	Home size per person (log)				Rooms				Vehicles				Phone			
Model	OLS				PRM				PRM				OLM			
	2007/08		**2011/12**		**2007/08**		**2011/12**		**2007/08**		**2011/12**		**2007/08**		**2011/12**	
	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.
Constant 3													-2.12	3.22	0.31	2.79
Constant 2													0.27	3.21	3.01	2.80
Constant	3.41**	1.03	3.04**	1.01	1.82**	0.64	2.03**	0.66	-4.85*	2.19	-4.24*	1.89				
age	-0.01	0.03	-0.03	0.03	-0.05*	0.02	-0.03	0.02	0.06	0.08	0.05	0.07	0.05	0.12	-0.02	0.09
age^2	0.00	0.00	0.00	0.00	0.001*	0.00	0.0003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
educ	0.01	0.03	0.05*	0.02	0.02	0.02	0.02	0.02	0.10*	0.05	0.06	0.04	0.02	0.08	0.08	0.06
female	0.23	0.22	-0.05	0.23	-0.12	0.19	-0.23	0.18	0.20	0.57	-0.15	0.49	-0.03	0.81	0.29	0.71
hh_size					0.04+	0.02	0.04*	0.02	-0.07	0.08	0.07	0.05	-0.06	0.10	0.00	0.09
married	-0.23	0.19	0.05	0.18	0.03	0.18	-0.05	0.13	1.27*	0.61	0.85*	0.42	0.37	0.86	0.31	0.55
coffee	0.19	0.31	0.18	0.31	0.07	0.25	-0.12	0.23	0.05	0.73	0.97	0.61	-0.83	1.17	-0.95	0.94
arabica_pct	-0.01+	0.00	0.00	0.00	-0.01*	0.00	-0.005*	0.00	-0.01	0.01	-0.01	0.01	0.01	0.01	-0.01	0.01
arabica_yld	0.00	0.00	0.0005**	0.00	0.00	0.00	0.0003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
coop_robusta	0.00	0.00	0.00	0.00	-0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00
coy_arabica	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fertilizer	0.00	0.00	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
organic_cert	0.39	0.25	0.42	0.26	0.47*	0.21	-0.06	0.25	0.34	0.68	-0.65	0.57	1.02	0.83	0.24	1.09
VIM	-0.24	0.30	-0.22	0.24	-0.12	0.23	0.37	0.25	0.41	0.76	1.02+	0.54	0.21	0.90	0.59	1.06
FTM	-0.63	0.44	-0.34	0.41	-0.47	0.37	0.26	0.37	2.22+	1.24	2.43*	0.94	-4.16**	1.64	-2.23	1.53
employment	0.07	0.21	-0.06	0.21	0.00	0.15	0.16	0.13	0.12	0.45	0.17	0.30	-0.55	0.64	0.44	0.54
business_owner	-0.22	0.26	-0.18	0.25	0.00	0.19	0.20	0.14	-0.12	0.52	-0.16	0.38	-2.74*	1.30	1.01+	0.63
N	118		118		118		118		118		118		118		118	
R^2 / Deviance	0.25		0.19		0.99		0.73		0.83		1.0173					
F-statistic / χ^2	2.09+		1.51		83.35		65.13		89.96		118.18					
Proportional Odds Assumption													16.21		13.92	
-2 Log L													153.61		200.88	
Likelihood Ratio													53.31***		53.28***	

*** Significant at <.01% level
** Significant at 1% level
*Significant at 5% level
+ Significant at 10% level
OLS=Ordinary Least Squares, PRM= Poisson Regression Model, OLM= Ordered Logit Model

Table E.1 present the explored dependent variables that were not reported in the thesis. These dependent variables were initially thought to be potential proxies for economic welfare, but their low explanatory power showed otherwise. The dependent variables include home size per person, number of rooms in the house, number of vehicles the household head owns and whether or not the household head owned a phone. The home size per person variable was generated by dividing the size of the house (in squared meters) by the total number of people living in the house. Because home size per person is a continuous variable, OLS was used to estimate this model. Both the number of rooms and vehicles are count variables and were estimated using a Poisson Regression Model (PRM). Both the rooms and vehicles models were tested for equidispersion condition using Log-Likelihood= $-2(\ln LL_{\text{negative binomial}} - \ln LL_{\text{poisson}})$. The test was not rejected and the PRM was preferred than the Negative Binomial Model. Because the PRM is a count model that begins with zero values (n=0, 1, 2, 3…) and because in the original data one room was the smallest value, the variable was transformed by subtracting one from each value (e.g. original variable room=n, transformed variable room=n-1). The phone dependent variable is an ordinal variable that takes the value of one if the household head did not owned a phone, two if he/she had a mobile or house phone and three if he/she had both a mobile and house phone. Because the parallel lines assumption was rejected with a Chi-square of 16.21, the model was estimated using ordered logit (OLM). In table E.1, while constant 3 refers having a mobile and house phone, constant 2 refers to having either a mobile or house phone.

It is important to note that models estimating the change from 2007/08 to 2011/12 were also explored for each dependent variable in table E.1 (and in fact in table 6.4), but due to their even lower explanatory power are not reported.

Table E.2 Ordinary Least Squares: Log of Weighted Price, 2011/12

model	(a)		(b)	
	Beta	**s.e.**	**Beta**	**s.e**
Constant	0.27+	0.16	0.09	0.18
age	0.00	0.00	0.00	0.00
educ	-0.01	0.01	-0.01	0.01
female	-0.09	0.07	-0.08	0.08
coffee_ha	0.28+	0.15	0.30+	0.18
home_size	0.00	0.00	0.00	0.00
arabica_yield	0.001*	0.00	0.001***	0.00
coop_arabica	0.91***	0.11		
VIM	-0.05	0.06	0.09	0.06
employment	-0.06	0.05	-0.07	0.05
business_owner	0.11	0.09	0.12	0.10
N	78		78	
R^2	0.5178		0.3516	
F-statistic	7.20***		4.10**	

*** Significant at <.01% level
** Significant at 1% level
*Significant at 5% level
+ Significant at 10% level

Table E.2 shows the econometric results of the WP model using the CVM and VIM variables, while omitting the effect of being in the FTM cooperative. This model was explored with the intention of capturing the importance of taking part of the VIM cooperative with respect to the CVM when the FTM variable is omitted. Exploring this effect was importance because (1) the VIM cooperative differs significantly from the FTM cooperative in, for example, geographical location of farms, time in business and structural organization, and (2) there is little or no variability in the log of weighted price in the FTM (see figure E.2).

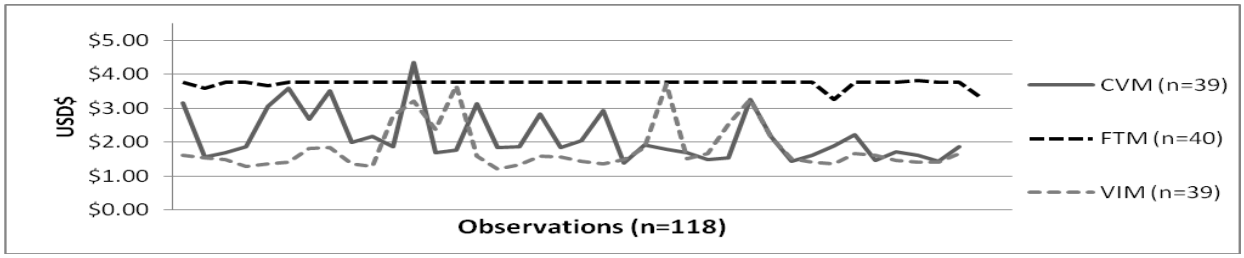


Figure E.2 Log of Weighted Price, 2011/12

In model (a) all the variables are included. The coffee area (coffee_ha), arabica yield and the percentage of arabica coffee sold to the cooperative (coop_arabica) are positive and statistically significant. Because the VIM and coop_arabica variables capture the same effect (as explained in chapter six), model (b) isolates the VIM effect by omitting coop_arabica. In both models,VIM effect the is not statistically significant, meaning that being part of the VIM cooperative does not influence the weighted price that its members receive for their coffee.

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