Competitiveness and determinants of coffee exports, producer price and production for Ethiopia

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4 August 2013

COMPETITIVENESS AND DETERMINANTS OF COFFEE EXPORTS, PRODUCER PRICE AND PRODUCTION FOR ETHIOPIA

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[1]**ABSTRACT**

The objective of this study was to analyze the performance of Ethiopia in its exports of coffee and to estimate the magnitude and effects of key economic determinants of coffee exports, producer price and production. In analyzing the competitiveness of the country in its exports of coffee, three distinct periods were considered, namely, years under the imperial regime (1961-73), under the military rule (1974-1991) and under the reformist government (1992-2010). The Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) measures of competitiveness were used for the analysis. Even though the results show that Ethiopia has comparative advantage in export of coffee, the same cannot be said of its overall performance on the international market owing to factors such as challenges with management of price risk, high transaction cost resulting from the extensive nature of the supply chain and the numerous actors and processes therein, challenges with quality control, low productivity of growers' fields, and incidence of smuggling. To improve upon its export performance and to ensure continuous growth in the major strongholds of the subsector (exports, prices and production), based upon estimates for the current study, we propose investment in yield-enhancing innovations, devising and implementation of measures to improve quality control in the supply chain, address issues with price risk, minimize incidence of smuggling and more importantly minimize transaction costs. In addition, measures should be put in place to increase and ensure continuous government support to the subsector, hold onto the current devaluation of the Ethiopian birr, ensure payment of fair prices to growers and appropriately transmit future increments, increase current area under cultivation to enhance efficient utilization of the abundant labour, and to attract more export-oriented foreign direct investments (as an opportunity for trade creation).

Keywords: Competitiveness, supply chain, determinants, export, producer price, production

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1.1   INTRODUCTION

The coffee subsector of Ethiopia has been and continues to be the foundation for the country's agricultural and economic development. The importance of the subsector in the country and the world market cannot be overemphasized. For instance, the subsector accounts not only for over 35% of agricultural foreign exchange earnings and about 4% of agricultural Gross Domestic Product (Agric. GDP), it also provides income to over 15 million people in the country (Ministry of Trade, 2012) through provision of jobs for farmers, local traders, processors, transporters, exporters and bankers. Through various taxes levied on the crop, it also serves as an important source of government revenue (ICO/CFC, 2000). In addition to these, coffee green exports from Ethiopia accounted for approximately 3.31% in value of world coffee green exports between the years 2001 and 2010.

Ethiopia stands in respect not only as the origin of *Coffea arabica* (Arabica coffee), an important producer and exporter, but it is also the highest consumer of the crop (variety) in Africa. By virtue of the importance of the crop in diets and culture of the populace, contribution to poverty reduction and importance in earning of foreign exchange, several policy measures under different regimes have been devised and implemented on both Marxist and non-Marxist ideologies towards developing the subsector. Each of such measures has contributed in part to the dramatic changes undergone by the coffee subsector over the past five decades. Adverse influences from past policy measures and changes in global and local prices of coffee have over the past years hindered achievement of most poverty reduction and subsector development goals, and worsened conditions of most producers and other players in the supply chain, leading mostly to distress sales of assets (Oxfam, 2002), default in payment of loans, drifting of farmers from coffee production, and increasing unemployment among others.

In spite of the above, Ethiopia still holds much respect in the global coffee market. As to whether she can stand the test of time given anticipated increases in world price of agricultural export commodities (including cocoa and coffee) over the next decade (World Bank 2007) and the accompanying intensification of competition on the supply-side with emergence of new producers and exporters of coffee is yet to be ascertained. To help mitigate any adverse future influences from competition on the world coffee market (that could preclude achievement of national development goals, including but not limited to income generation and poverty reduction) and ensure effective and efficient participation and contribution of the country to world coffee green production and exports, there exists a strong case to assess its past and current performance in export of the commodity (bearing in mind influences from past policy measures), and to identify and estimate the magnitude and effects of key economic determinants on the major strongholds of the subsector namely exports, price and production. Many studies have been carried out with the view to informing future policy prescriptions, but majority of these have focused on issues related to price transmission (including Worako *et al*, 2008), commercialization of agriculture in coffee growing area (including Gebreselassie and Ludi, 2008) and marketing and trading policies (including ICO/CFC, 2000). The aim of this current study is to bridge current information gap and in order to provide a springboard for future policy prescriptions, we begin with how policies have evolved over the years.

1.2   EVOLUTION OF POLICY ON COFFEE AND GOVERNMENT ASSISTANCE

Policies on coffee in Ethiopia may be looked at under three different forms of government; imperial government (until 1974), military rule with Marxist ideological orientation from 1974-1991 and a federal (reformist government) governance system from 1991 onwards (ICO/CFC, 2000).

Under the imperial government, the marketing structure for coffee was free market-based, with the industry been regulated by the National Coffee Board of Ethiopia. During this period, coffee was bought by traders at various stages of the supply chain and exported, with relatively minimal quantities of the crop been auctioned by traders at voluntary auctions in Dire Dawa and Addis Ababa (ICO/CFC, 2000). The role of National Coffee Board of Ethiopia was limited to regulation of the auction process and quality control. The free market-based system lasted until 1974, from whence it was replaced by a system with heavy State involvement.

After the revolution in 1974, the former National Coffee Board of Ethiopia was replaced by the Ministry of Coffee and Tea Development (MCTD), and coffee production and marketing became

heavily controlled by the state. In as much as private traders were still given permit to engage in purchases of the crop, much purchase was handled by the state-owned Ethiopian Coffee Marketing Corporation (ECMC), established in 1977. Activities of private traders were constrained by licensing requirements, fees and taxes. The ECMC, was reportedly responsible for handling 90% of supplies (ICO/CFC, 2000), and producers had limited flexibility in terms of the time and price for selling their produce (as prices were fixed). Under this regime, Ethiopian agricultural policy was centrally planned and controlled by a system of quotas and price fixing. All coffee, handled either by the ECMC or private traders had to go to auction where the price fixing and quota system apportioned ECMC with all the washed coffee, and the largest quota for unwashed coffee, thereby limiting competition between private and public buyers. During this period, grower prices were set by the MCTD, with the difference between the grower price and export (f.o.b) price less marketing costs taken by the government. With the less competitive marketing environment of the country and decline in world prices (during this period) following the collapse of the International Coffee Agreement quotas, a drastic decline in production and exports from the country was experienced. In spite of the dark image portrayed about this regime, it did place much emphasis on quality of Ethiopian coffee exports than the preceding regime precisely because both washed and unwashed coffees were subject to a number of inspections and quality controls throughout the marketing chain.

Control of the State over coffee production and marketing was once again minimized through partial liberalization of internal marketing in 1993. Since 1991, there has been a transformation from a centrally planned economy to a market-oriented economy. This was a result of the replacement of the military government (*Dirge* regime) by a democratic regime, thereby bringing all Marxist economic policies and ideas to a halt. Liberalization of the coffee subsector was purposed on promoting production and reducing incidence of smuggling through the increase in grower prices. In contrast to the fixed price set under the *Dirge* regime, payment to farmers in the reform period was determined by the market although government continued to set a floor price until 1997 above which prices offered to growers at times rose. This reform brought many new exporters and intermediaries into the sector, and the proportion of coffee handled internally by private traders was increased to 85% of deliveries at the auction while the number of licensed private exporters also increased from 14 to 240 (with approximately 75 being active by the year 1999), (ICO/CFC, 2000).

Following initiation of the reform in 1991, the ECMC was split into two public enterprises namely the Ethiopian Coffee Purchase and Sales Enterprise (ECPSE) and the Ethiopian Coffee Export Enterprise (ECEE). The ECPSE purchases coffee internally and delivers it to the auction, and the ECEE purchases coffee from the auction and exports it. As a means of enhancing competitiveness of the subsector, licensing fees have been lowered, the quota system at the auctions has been abolished, private traders are allowed to trade in washed coffees, and wholesalers (*Akrabies*) and exporters are allowed to sell coffee domestically at market prices, instead of through parastatals. In addition, Cooperative Unions have been given permit to engage in direct sales and export (Dempsey and Campbell, undated) since the year 2001. As of the year 2012, more than 120 Ethiopian coffee exporters participated in processing and export of coffee to various destinations. Of these export companies, 95% were private companies, 5 coffee growing farmers' cooperative unions and 2 government enterprises (Ministry of Trade, 2012).

With increased competition and lower taxation of farm income from sales of coffee, grower prices as a proportion of the export price has increased. By figures reported by Anderson and Nelgen (2012), farm taxation fell markedly from 42.78% in 1992 to 2.99% in the year 2008. This rate compares favourably with that of other major exporting countries like Indonesia (11.09% by 2008) and Nicaragua (64.01% by 2008), but above that for Colombia (1.41% by 2008). The reduction in farm taxation has contributed greatly to increased coffee green outputs in the country since the year 2005. Increased private participation also helped raise coffee supply to auction markets from 60,000 tons in 1991 to 221,000 tons in 2005/2006 (Worako *et al*, 2008). In spite of these improvements however, the post-reform marketing system in Ethiopia is criticized to have resulted in concentration of power at the export market, mounting illegal trade across borders, unhealthy competition in the primary and auction markets, and high transaction costs (Petit, 2007).

Figure 1.0   Nominal Rate of Assistance for Ethiopia (coffee)
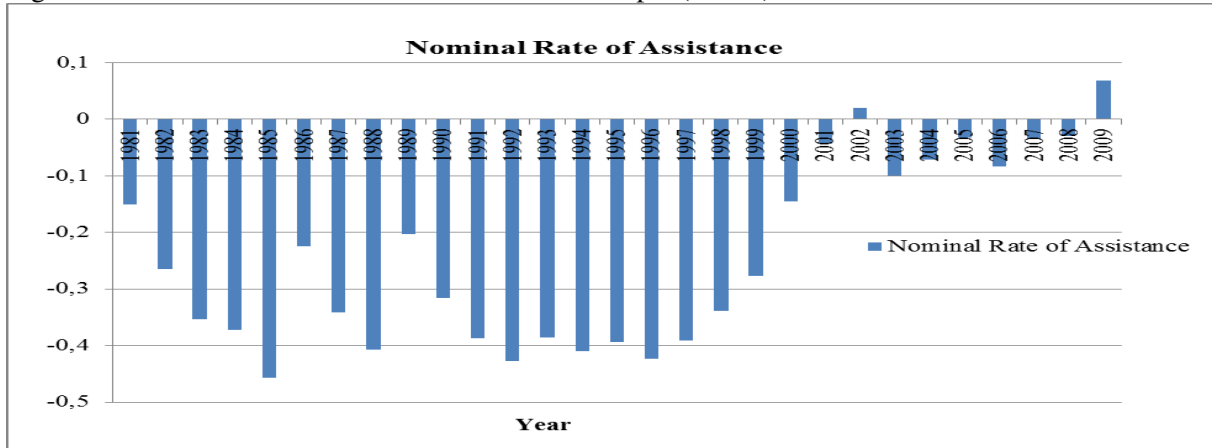
Source: Authors' construct with data from Anderson and Nelgen (2012)

The reform has also been criticized for contributing to poor quality control in the early years of liberalization (ICO/CFC, 2000). Compared to the *Dirge* (military) regime where much emphasis was placed on quality, internal quality control in the initial phases of the reform was left to the market. This however is currently being addressed by the Coffee and Tea Authority (CTA) through cupping (coffee tasting) before auction, and with auction price closely related to quality. The quality of coffee is affected by the production system used, hence the need to throw some light on the coffee production systems in Ethiopia.

1.3   COFFEE PRODUCTION SYSTEMS IN ETHIOPIA

With approximately 95% of coffee production in Ethiopia been considered organic, coffee production in the country is categorized into four (4) systems namely forest coffee, semi-forest coffee, garden coffee and plantation coffee (Ministry of Trade, 2012).

- *Forest Coffee*:
  This system of production is found mostly in the South and South-Western Ethiopia, specifically in Bale, West Wolega, Metu, Keficho-Shekicho, Bench-Maji and Jimma). These areas are regarded as the origin of *Coffea arabica* (Arabica coffee). Forest coffee is not intentionally grown by growers, but is rather self-sown and grows under the shade of natural forest trees. This type of coffee offers a wide diversity for selection and breeding so as to have plant stock selected for disease resistance, high yields and of good quality in terms of aroma and flavour. Production under this system represents 10% of national output.

- *Semi-Forest Coffee*:
  Accounting for 35% of national coffee production, this system of production is also found in the Southern and South-Western parts of Ethiopia. Trees under this system enjoy relatively more sunlight than those under the forest coffee system of production. It involves thinning and selection of forest trees by farmers so as to create room for adequate sunlight and at the same time ensure adequate shade.

- *Garden coffee*:
  This system of production is found mainly in the Southern and Eastern parts of the country specifically in South and North Omo, Hararghe, Gedeo, Sidamo, Wolega and Gurage zones. It accounts for approximately 50% of national production and is located near residences of growers. It is planted at low densities and is mostly fertilized with organic materials.

- *Plantation coffee*:
  Accounting for 5% of national production, plantation coffee is grown on state-owned plantations (with some currently been privatized) and on well managed smallholder coffee farms. Vital agronomic practices like weeding, spacing, fertilizer and herbicide application

(for state-owned plantations), manuring, and shade regulation among others are practiced under this system.

1.4   DEVELOPMENTS IN DOMESTIC SUPPLY INDICATORS

Until the year 2004, coffee production in Ethiopia was driven more by improvements in yield than by expansion in area harvested. Area harvested of coffee in the country has over the period 1971-2011 been directly proportional to world price of the crop, decreasing continuously from 622,000 hectares in 1971 to 282,313 hectares in 1991 (a decrease of 54.61%). Production and yield on the contrary, increased respectively from 182,200 tonnes in 1971 to 210,000 in 1991(an increase of 15.26%) for production and 0.293Mt/ha in 1971 to 0.744Mt/ha in 1991 (an increase of 153.92%) for yield. The general decline observed in world price of coffee during the aforementioned periods, coupled with high farm taxation and strict farmers' quota applied prior to the reform in 1991, led to switching of most farmers from production of coffee into production of Chat (a stimulant and substitute for coffee in Ethiopia).

Introduction of higher prices through reduction in farm taxation and ending of farmers' quota in the early years of the reform between 1991 and 1993 triggered a return of most farmers into coffee production. With liberalization of internal marketing and improvement in production and marketing conditions in the country came significant increases in harvested area, yield and production. Harvested area increased from 282,313 hectares in 1991 to 498,618 hectares in the year 2011 (19.84% less than the value for 1971 but 76.62% over the value for 1991). Production increased from 210,000 tonnes in 1991 to 370,569 tonnes in 2011 (an increase of 103.61% over the value for 1971 and 76.46% over the value for 1991). Yields however, between the two years was almost the same, 0.744 for 1991 and 0.743 for 2011. Regardless of the stagnation observed in yields for the two periods (1991 and 2011), major improvements were observed in productivity between the years 1994 and 2003 when average yields were in the range of 0.865Mt/ha for 1999 and 1.03Mt/ha for the year 2003. The highest yield (1.10Mt/ha) for the period 1961-2011 was observed however in the year 2007, with the lowest been observed in the year 1962 (0.22Mt/ha). Productivity (yield) of coffee in Ethiopia since the year 2004 has been generally unsatisfactory compared to the preceding decade (1994-2003). The highest value of harvested area (622,000 hectares) was observed in the year 1971 with the lowest (218,343hectares) observed in the year 2003. Lowest output (127,400 tonnes) was observed in the year 1961, with the highest observed in the year 2011 (370,569 tonnes)

Figure 2.0   Developments in coffee production, harvested area and yields
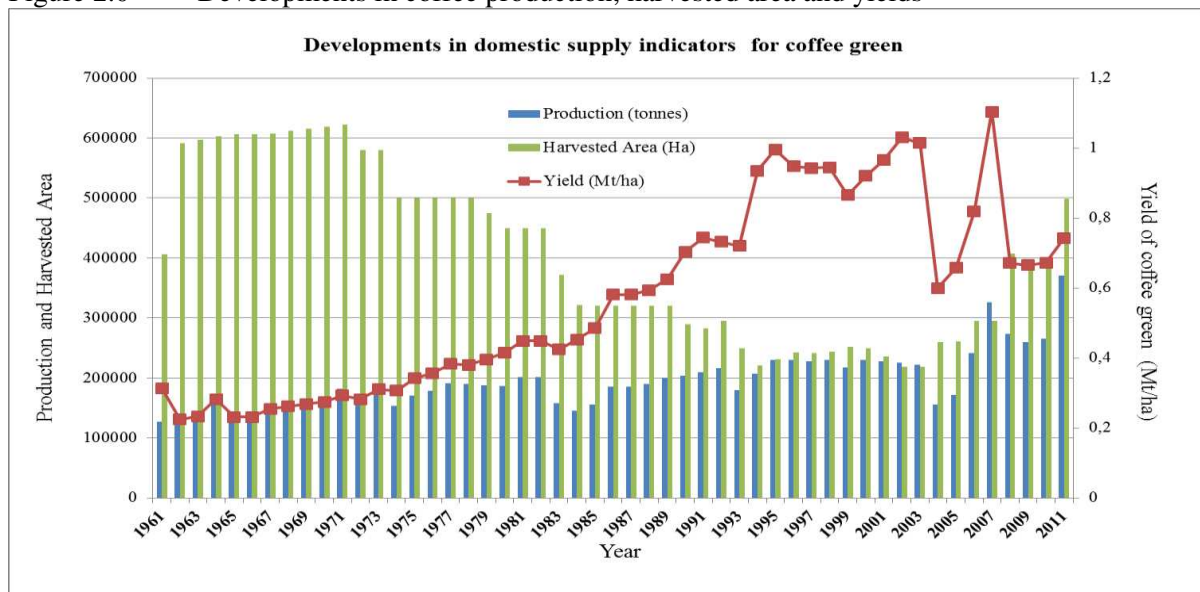
Source: Authors' construct with data from FAOSTAT

Although the trend in yields of coffee in Ethiopia has been generally positive, there still exists room for further improvement as the national average yield (0.743Mt/ha) lags well behind yields in other major exporting countries like Vietnam (2.1879Mt/ha), Costa Rica (1.0106Mt/ha), Brazil (1.2567Mt/ha), Guatemala (0.9717Mt/ha), and Honduras (1.0659Mt/ha). Furthermore, it is below the world average yield for coffee green (0.7907). It is however well above the average for the continent (Africa) (0.4719Mt/ha), Kenya (0,2266Mt/ha), Indonesia (0.4903Mt/ha) and Colombia (0.6331Mt/ha). All the reported yield figures for the respective countries for the year 2011, shows that with the adoption of appropriate technologies, Ethiopia stands a chance of increasing its national average yield of coffee, a requirement vital for enhancing competitiveness of the coffee subsector in the country.

1.5   DEVELOPMENTS IN EXPORT OF COFFEE GREEN

Exports of coffee green from Ethiopian have over the past five decades increased from 56,024 tonnes in 1961 to 211, 840 tonnes in the year 2010 (an increase of 278.12%). In monetary terms, exports of coffee green increased from approximately $38million in 1961 to $677million in 2010 (an increase of 1681.58%). Most of the improvements in both volume and value of exports were observed after the year 2003. Relative stagnation in exports between the years 1961 and 1991 could be attributed to inefficiencies in marketing and policy environment under the former regimes and to the volatile nature of world price of the commodity. The lowest volume of export (43,858 tonnes) was observed in the year 1992, with the highest (211,840 tonnes) observed in the year 2010. In value terms, the highest value ($677million) for coffee export was observed in the year 2010, with the lowest ($37,558million) recorded in the year 1961.

Figure 3.0   Developments in export of coffee green
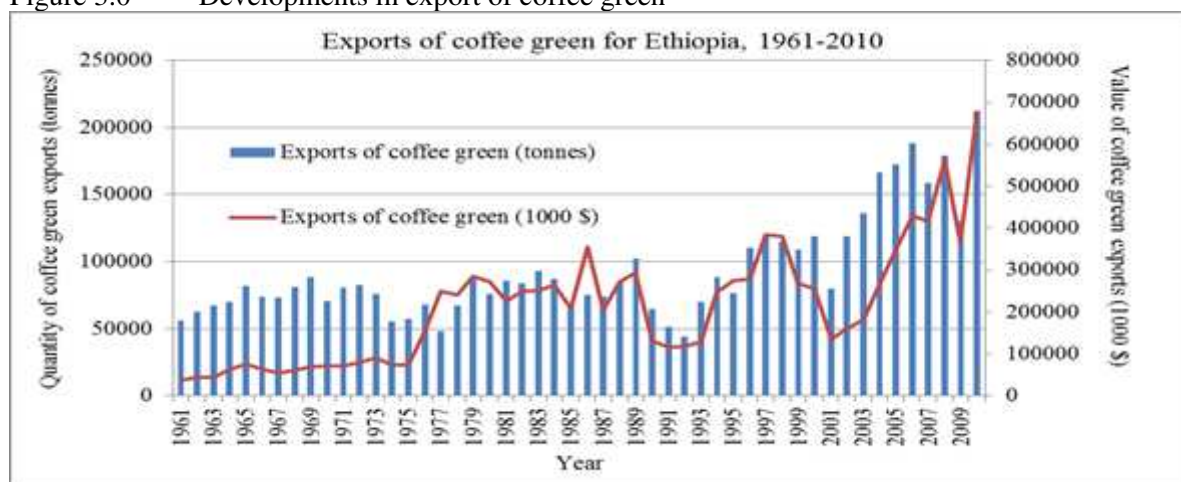
Source: Authors' construct with data from FAOSTAT

1.6   DOMESTIC CONSUMPTION OF COFFEE

With Ethiopian being not only a major producer and exporter of coffee, but as well the highest consumer thereof in Africa, approximately 51% of production was locally consumed in 1961, 64% in 1985, 62% in 1986, 65% in 1987, 51% in 2007 and 52% in the year 2009. The quantities of production consumed domestically were relatively higher prior to the reform in 1991. This could be attributed to the relatively lower number of exporters under the former regimes (especially the *Dirge* regime), declines in world price of coffee which decreased incentive for exporters to increase the volume of exports thereby making larger volume available on the domestic market for consumption, and to the increases in output observed during the pre-reform period. Share of consumption in total production in the immediate years following initiation of the reform were relatively lower, decreasing from as high as 65% in 1987 to 25% in 2003. It however has taken on an increasing trend since the year 2004. The

relatively smaller share of domestic consumption in production in the early years of the reform could be attributed to increases in exports observed in the country during that period as a result of increases in the number of exporters following the liberalization of internal marketing.

Figure 4.0   Developments in domestic consumption of coffee
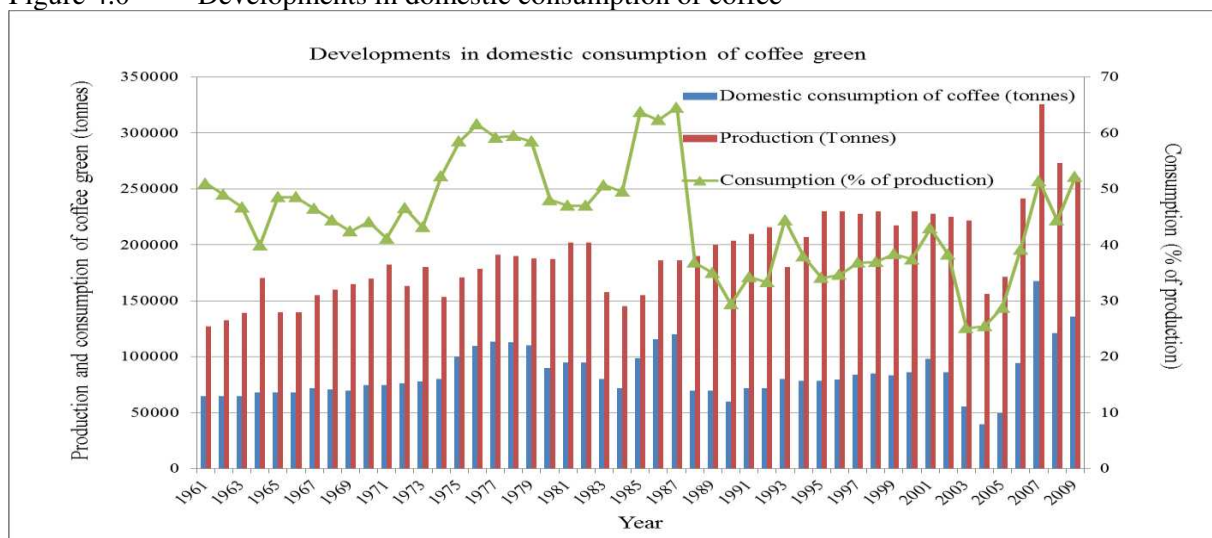
Source: Authors' construct with data from FAOSTAT

1.7   DEVELOPMENTS IN PRODUCER PRICE OF COFFEE FOR ETHIOPIA

Finding up-to-date data on producer price (Birr) for Ethiopia has been an uphill task; therefore the current study assessed developments in producer price for the period 1967 to 2005 which was available, to provide some basis for inference.

Both real and nominal prices for coffee green were highly volatile (fluctuating) over the entire period, depicting an increasing trend however from the year 1992 (except for the years 1996,1997,1998,2002 and 2003 where some declines were observed). The lowest nominal producer price of coffee per tonne (1040 Birr) was observed in the year 1969, with the highest (12,467 Birr) recorded in the year 2005. The nominal prices for growers were relatively higher in the post-reform period ranging between 1,670 Birr for the year 1992 and 12,467 Birr for 2005, compared to the pre-reform range of 1040Birr for the year 1969 and 4224 Birr for 1989.

Figure 5.0   Real and nominal producer prices for coffee green in Ethiopia
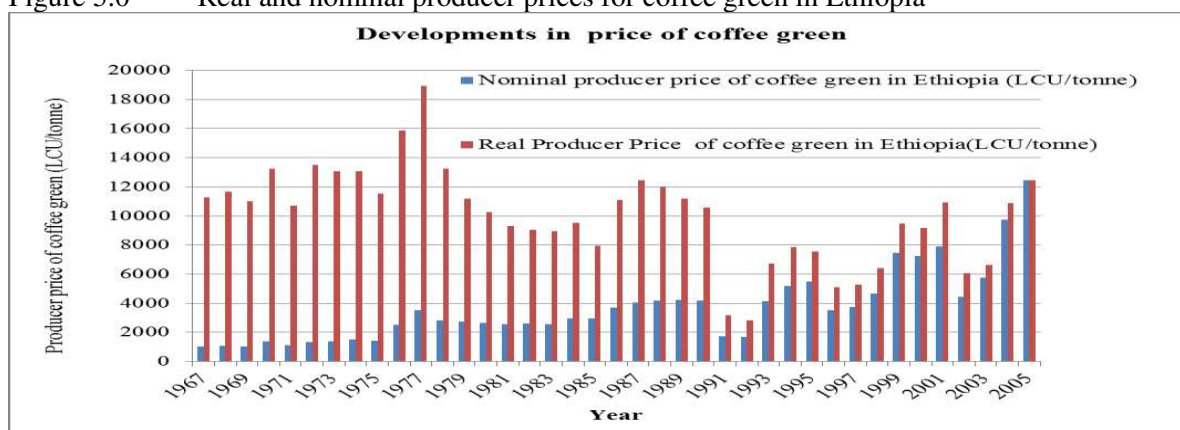
Source: Authors' construct with data from FAOSTAT

In real terms however, the highest price (18,913 Birr) was observed in the year 1977, with the lowest (2808 Birr) recorded in the year 1992. The real prices in contrast to the nominal prices, were relatively

higher in the pre-reform period, and declined continuously from as high as 18,913Birr in the year 1977 to 2808 Birr in the year 1992, depicting a general increasing trend thereafter.

1.8   COFFEE SUPPLY CHAIN OF ETHIOPIA

The supply of coffee for Ethiopia is characterized by a long-chain with several intermediaries. Primary suppliers of the coffee berries are of two forms namely, small-holder coffee farmers (who actually grow coffee in gardens close to their residences or in mini-plantations) and collectors of forest and semi-forest coffee. In considering the two forms of primary suppliers, the small-holder farmers make use of vital inputs of production like land and labour although coffee production in Ethiopia is generally a low input activity. On turning bright red on the trees, coffee berries are picked by farmers and collectors of the forest and semi-forest coffee. Most of the growers who are affiliated to coffee cooperatives send the picked berries to the cooperative organization for washing or sun-drying and de-pulping. Figure 6 is a summary of the supply chain of coffee in Ethiopia.

Figure 6.0   Coffee supply chain of Ethiopia
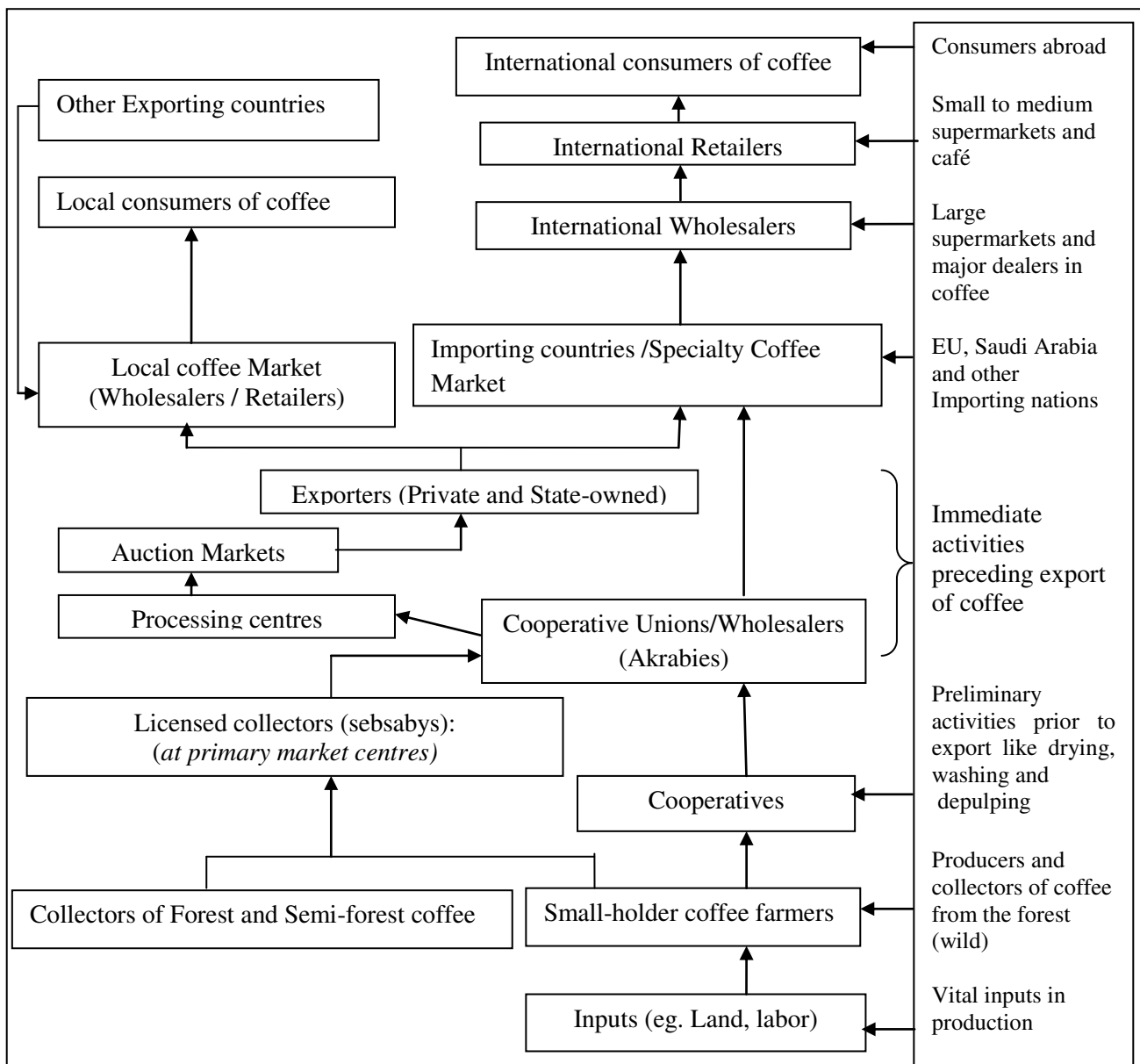
Source: Authors' construct

Farmers who reside in distant villages far from pulpery or any cooperative organization mostly sundry the beans themselves, remove the husks, and transport them to the primary market centres. Collectors of forest and semi-forest coffee also take their sundried beans to the primary market centres. In the primary market centres, the sun-dried beans are sold to the licensed collectors (*Sebsabys*), who in turn are required to sell the sundried beans to the wholesalers (*Akrabies)* or the Ethiopian Coffee Purchase and Sales Enterprise (ECPSE) wing of the former Ethiopian Coffee Marketing Corporation (ECMC). *Sebsabys* are permitted to buy from farmers but can only sell to *Akrabies* or the ESPE, and cannot take coffee directly to the auction because *Akrabies*, *Sebsabys* and exporters have separate and different licenses. *Akrabies* are permitted to buy coffee from *Sebsabys* (but not from farmers) and deliver it to the processing centres and to the auction thereafter, but not export it. Exporters are only permitted to buy coffee from the auction and not from *Sebsabys* or farmers (ICO/CFC, 2000).

Sebsabys have a monopoly on primary marketing of sub-dried coffee in the private sector (except for the production handled by cooperatives) since producers are not permitted to deliver unwashed coffee directly to *Akrabies*. After the preliminary activities of washing and de-pulping berries brought to them by their members, the cooperative organizations send the washed coffee to Cooperative Unions, who together with the *Akrabies* or the ESPE have right to send the beans to processing centres from whence they are delivered to the central auction markets in Addis Ababa and Dire Dawa. Since the year 2001, Cooperative Unions have been given permit by the government to engage in direct sales without necessarily involving parastatals; unions with sufficient capital export directly without necessarily getting their produce to the auction markets (Dempsey and Campbell, undated). Such actions however have quality implications in the long run. At the auction markets, exporters purchase coffee, process it to export standard and then export it to destinations abroad. Some of the processed product are however sold to local wholesalers and retailers and then to consumers from there. As of the year 2010/2011, 32.61% of processed coffee from Ethiopia was exported to Germany, 11.43% to the United States of America, and 11.38% to Saudi Arabia. Belgium, Italy, France and Sweden were as well major destinations for Ethiopian coffee exports.

Table 1:   Value of export by destinations for 2010/2011

No	Country	Value ($)	%Share
1	Germany	274,430,356	32.61
2	United States of America	96,229,081	11.43
3	Saudi Arabia	95,789,714	11.38
4	Belgium	65,709,947	7.81
5	Italy	56,316,894	6.69
6	France	42,903,597	5.10
7	Sweden	40,234,422	4.78
8	Japan	34,235,899	4.07
9	United Kingdom	25,327,211	3.01
10	Sudan	16,408,741	1.95
11	Korea, Republic	11,275,767	1.34
12	Australia	10,506,457	1.25
13	Canada	8,036,546	0.95
14	Spain	7,511,057	0.89
15	Russia	7,377,043	0.88
	Sub Total	792,292,732	94.14
	Other 38 countries	49,354,143	5.86
	All countries	841,646,875	100

Source: Ministry of Trade, 2012

In the international market, the imported product is distributed to wholesalers (large supermarkets), to retailers and then to consumers. A report by the European Commission (2011) has

shown that Ethiopia's Specialty Coffees (Sidamo, Yirgacheffee and Harar) are sold from US$5-9 per kg f.o.b. whereas the retail market price of these Specialties is above US$ 50 per kg. The share of the small scale producer has also been revealed to be on average 2.8% of the retail price

Figure 7.0 Value distribution of Ethiopian Specialty Coffee
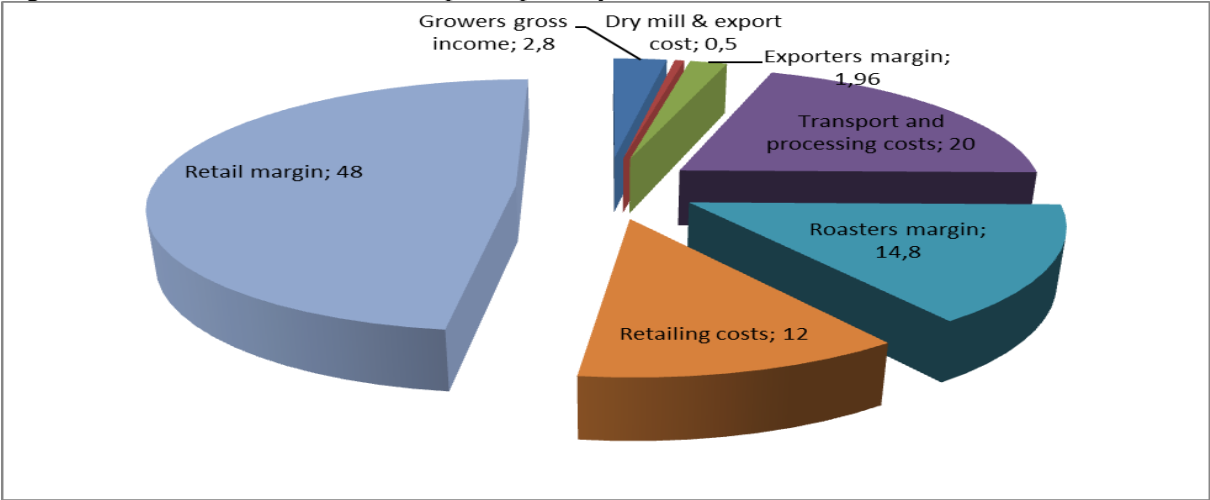
Source: European Commission (EC), 2011

Although a major exporter of coffee, data sourced from the agricultural production database of the FAO indicates that in the years 2006 and 2008 , Ethiopia imported respectively 40,928tonnes and 27,103 tonnes of coffee green at values of approximately $88million and $85m. This implies that Ethiopia engages not only in inter-commodity trade, but also in intra-commodity trade. Nonetheless, the country remains a major net exporter of coffee given that its meagre imports are even irregular.

1.9   GLOBAL EXPORTS AND IMPORTS OF COFFEE

Global exports of coffee green increased from approximately 5.922 million tonnes in the year 2006 to 6.581 million tonnes in 2010 (representing an increase of 11.13%). Over the period 2006-2010, a total of 51.37% of world exports of coffee green were from the Americas, 29.59% from Asia and Oceania, 10.44% from Africa and 8.58% from Europe. At the country level, Brazil accounted for 25.42% of global coffee green exports during the aforementioned period, Vietnam 18.08%, Colombia 8.66%, Indonesia 6.85%, Guatemala 3.63%, Peru 3.40%, Honduras 3.16%, Ethiopia 2.76% and India 2.54%. Mexico, Costa Rica and Nicaragua jointly accounted for 4.73% of world coffee green exports between the years 2006 and 2011.

Table 2:   World exports of coffee green

Country/Region	2005/06	2006/07	2007/08	2008/09	2009/10	5-year average 2005/06-2009/10	
			(thousand tonnes)				Share
World Total	5922	6158	6346	6305	6581	6262	100%
Total Americas	3123	3197	3292	3167	3306	3217	51.37%
Total Asia &Oceania	1712	1825	1812	1937	1980	1853	29.59%
Total Africa	656	690	640	611	675	654	10.44%
Total Europe	431	445	602	589	619	537	8.58%
Brazil	1476	1488	1567	1639	1791	1592	25.42%
Vietnam	981	1232	1061	1168	1218	1132	18.08%
Colombia	600	637	603	458	410	542	8.66%
Indonesia	412	321	468	510	433	429	6.85%
Guatemala	204	231	230	234	235	227	3.63%

Peru	238	174	225	197	230	213	3.40%
Honduras	172	207	199	199	215	198	3.16%
Ethiopia	188	158	179	130	212	173	2.76%
India	188	153	150	126	178	159	2.54%
Mexico	124	135	109	129	103	120	1.92%
Costa Rica	96	91	110	78	74	90	1.44%
Nicaragua	83	73	91	80	102	86	1.37%

Source: Authors' computation with data from FAOSTAT

As may be seen from table 3, Europe accounted for 55.37% of total coffee green imports between the years 2006 and 2011, when world imports increased from approximately 5.743 million tonnes to 6.249million tonnes (representing an increase of 8.81%). During this period, the Americas accounted for 25.35% of global coffee green imports, Asia and Oceania 15.06% and Africa 4.20%. At the country level, most of such imports were into the United States of America (21.46%), Germany (17.41%), Italy (7.54%), Japan (6.69%), Belgium (4.69%), France (4.02%) and the United Kingdom (2.07%). The Netherlands, Finland and Austria jointly account for 3.69% of global imports between the years 2006 and 2011.

Table 3: World imports of coffee green

Country/Region	2005/06	2006/07	2007/08	2008/09	2009/10	5-year average 2005/06-2009/10	
			(thousand tonnes)				Share
World Total	5743	5904	6047	6036	6249	5996	100%
Total Europe	3163	3242	3355	3359	3481	3320	55.37
Total Americas	1496	1516	1528	1498	1564	1520	25.35
Total Asia &Oceania	831	912	868	921	984	903	15.06
Total Africa	254	234	296	258	220	252	4.20
USA	1276	1313	1311	1256	1280	1287	21.46%
Germany	1001	1022	1055	1053	1090	1044	17.41%
Italy	424	452	457	457	469	452	7.54%
Japan	423	390	388	391	411	401	6.69%
Belgium	222	193	363	314	312	281	4.69%
France	223	245	223	254	262	241	4.02%
United Kingdom	118	117	121	128	138	124	2.07%
Netherlands	146	153	65	72	74	102	1.70%
Finland	65	67	71	67	66	67	1.12%
Austria	66	69	65	27	32	52	0.87

Source: Authors computation with data from FAOSTAT

2.1 MODEL SPECIFICATION AND DATA

The current study analyzes the performance of Ethiopia in export of coffee green (for the period 1961-2010) and estimates the magnitude and effects of key economic determinants of coffee exports, producer price and production (for the period 1981-2005). Data used in the current study were sourced from the agricultural production database of the FAO (FAOSTAT), the United Nations Conference on Trade and Development (UNCTAD) and the International Rice Research Institute (IRRI). In the following sessions, several indices and models for determining and assessing the performance of Ethiopia in coffee trade have been discussed; but first of all, why do countries engage in trade in the first place?

2.2 COMPETITIVENESS

Trade theory suggests that countries do engage in trade in order to take advantage of differences among them in terms of factor endowments and technology and that the competitiveness of a country for a specific commodity is based on the concept of comparative advantage. Several trade measures have been used in past studies for measuring a country's competitiveness in a commodity. Among such are the Revealed Comparative Advantage (RCA) (Balassa, 1965), Relative Import Advantage and Relative Trade Advantage (Vollrath, 1991), the Revealed Symmetric Comparative Advantage (as index of competitiveness) (Nwachuku *et al*, 2010) and the Net Export Index (NEI) (Banterle and Carraresi, 2007). In this study however, the competitiveness of Ethiopia in its export of coffee green is analyzed using the Revealed Comparative Advantage (RCA) and the Revealed Symmetric Comparative Advantage.

- **Revealed Comparative Advantage, RCA**

Bearing the same meaning as the revealed export advantage, the RCA measure calculates the ratio of a country's export share of a commodity in the international market to the country's export share of all other commodities. In the current study, RCA is defined as follows:

$$RCA_{ij} = (X_{ij}/X_{it}) / (X_{jw}/X_{tw})$$

Where X_{ij} is the value of Ethiopia's exports of coffee green; X_{it} is the total value of agricultural exports of Ethiopia; X_{jw} is the value of world exports of coffee green ; and X_{tw} is the total value of world agricultural exports

- **Revealed Symmetric Comparative Advantage (RSCA)**

The Revealed Symmetric Comparative Advantage measure reflects the RCA in its symmetric form as an index of competitiveness. It is computed as follows:

$$RSCA = (RCA-1 / RCA+1)$$

and it ranges from -1 to +1. The closer the value is to +1, the higher the competitiveness of a country in the commodity of interest. The analysis is focused on three distinct periods namely 1961-1973 (era of the semi-feudal imperial government), 1974-1991 (era of the Military rule with Marxist ideological orientation), and from 1992-2010 (era of the federal government–period of reform and liberalization of internal marketing).

2.3 DETERMINANTS OF COFFEE EXPORTS, PRODUCER PRICE AND PRODUCTION

In estimating the magnitude and effects of key economic determinants of exports, producer price and production for Ethiopia, three models were specified and estimated with the OLS estimator after verification of data on the respective series through the Phillips-Perron unit root test.

Equation 1: Determinants of coffee green exports
$$\ln EX_t = \beta_0 + \beta_1 \ln PRO_{t-1} + \beta_2 \ln PPR_{t-1} + \beta_3 \ln (WCP_{t-1}/PPR_{t-1}) + \beta_4 NRA_t + \beta_5 \ln CONS_t + \beta_6 \ln EXR_{t-1} + \beta_7 FDI_t + u_t$$
A priori exp: $PRO_{t-1}>0$; $PPR_{t-1}>0$; $(WCP_{t-1} / PPR_{t-1})<>0$; $NRA_t<>0$; $FDI_t>0$; $EXR_{t-1}>0$; $CONS_t<0$

Equation 2: Determinants of domestic producer price of coffee
$$\ln PPR_t = \beta_0 + \beta_1 \ln PPR_{t-1} + \beta_2 \ln WCP_t + \beta_3 \ln NRA_t + \beta_4 CONS_{t-1} + \beta_5 \ln EX_{t-1} + \beta_6 \ln EXR_t + \beta_7 \ln CPD_t + u_t$$
Apriori exp: $PPR_{t-1}>0$; $WCP_t>0$; $NRA_t>0$; $CONS_{t-1}>0$; $EX_{t-1}>0$; $EXR_t>0$; $PRO_t<0$

Equation 3: Determinants of coffee green production
$$\ln PRO_t = \beta_0 + \beta_1 \ln YLD_t + \beta_2 \ln PPR_{t-1} + \beta_3 \ln (WCP_{t-1} / PPR_{t-1}) + \beta_4 NRA_t + \beta_5 \ln RSCA_1 + \beta_6 \ln ALF_{t-2} + u_t$$
A priori exp: $YLD_t>0$; $PPR_{t-1}>0$; $(WCP_{t-1} / PPR_{t-1})<>0$; $NRA_t>0$; $FDI>0$; $RSCA_t>0$; $ALF>0$

Where EX_t - quantity of coffee green export (tonnes)
       PRO_t - Coffee green production (tonnes)
       PPR_t - domestic producer price of coffee green (LCU)
(WCP_t/PPR_t) -Wolrd price (Brazilian Natural) to domestic producer price ratio of coffee green
       NRA_t - Nominal rate of assistance (%)
       $CONS_t$ - Domestic consumption of coffee (tonnes)
       EXR_t - Exchange rate (Ethiopian Birr/ US$)
       FDI_t - foreign direct investment (US$ millions at current prices and current exchange rates)
       YLD_t -Yield of coffee green (Mt/ha)
       $RSCA_t$ - Revealed Symmetric Comparative Advantage (index of competitiveness)
       ALF_t - Agricultural labour force ("000" persons)
       β_0 - Intercept term
       β_i - Coefficients/elasticities
       u_t - Stochastic error term assumed to be *iidN(0Σ)*

3.1   RESULTS
This section is dived into two parts:
-   The first focuses on analyzing Ethiopia's performance in export of coffee green under the three past and present regimes (semi-feudal imperial government, the *Dirge*/military regime, and the federal government).
-   The second part focuses on estimating the magnitude and effects of the specified determinants of coffee exports, producer price and production

3.2   COMPETITIVENESS OF ETHIOPIA'S COFFEE GREEN EXPORTS
Results of both Revealed Comparative Advantage and Revealed Symmetric Comparative Advantage show that Ethiopia has comparative advantage in export of coffee green. Its performance in export of the crop was lowest under the imperial regime (1961-1973) and generally unsatisfactory for the entire period (1961-2010).

Characterized by a free market system where traders bought and directly exported coffee beans at any time along the supply chain, the local coffee industry under the imperial regime lacked a well-developed market structure and had quality problems with the beans exported from the country due to the minimum emphasis placed on quality under this regime. Growth in production of coffee during this era was as well hampered by low yields. These factors hindered any improvement in the performance of the country in coffee exports and at the latter stage of the regime, led to a decline in the country's performance between the years 1971 and 1973 when RCA decreased from 12.43 in 1971 to 8.89 in 1973, with RSCA also decreasing from 0.85 in 1971 to 0.80 in 1973.

A move from the imperial to the military regime led to a high state involvement in coffee marketing. Under the military rule, private traders were constrained in their activities through licensing requirements, high fees and taxes levied by the government, and growers were not left out: they were heavily taxed. In addition, prices of the produce were fixed by the Ministry of Tea and Coffee Development giving no flexibility in terms of time and prices to the growers. These inhibitions in the trading environment limited competition on the market, led to drifting of most farmers from coffee production into the production of "Chat", and triggered large scale smuggling into neighbouring countries. These responses precluded improvement in the country's competitiveness in export of coffee in the early years of the regime. In addition, the world price of coffee was on a decline for most years under this regime, thereby further reducing incentives for most growers and private traders to engage in trade under the military regime. The early years under this government system between 1974 and 1980 saw no major improvements in the country's performance. Relatively low transaction cost in coffee trading under the military government and greater emphasis placed on quality control at the latter years (1986-1991) helped improve the country's performance in exports of coffee, as mirrored by increase of the RCA from 12.20 in 1985 to 36.09 in 1991, with the RSCA also increasing from 0.85 to 0.95. The military government following the short improvement in export performance between 1986 and 1991 was however replaced by the federal (reformist) government in 1991.

Table 4:   Coffee export performance of Ethiopia

	Revealed Comparative Advantage	Revealed Symmetric Comparative Adv.
1961	10.2547	0.8223
1962	10.7957	0.8305
1963	10.0866	0.8196
1964	10.4947	0.8260
1965	12.9976	0.8571
1966	11.1479	0.8354
1967	11.2611	0.8369
1968	10.9384	0.8325
1969	11.8454	0.8443
1970	11.0152	0.8335
1981	12.4358	0.8511
1972	10.4240	0.8249
1973	8.8903	0.7978
1974	8.1746	0.7820
1975	10.9211	0.8322
1976	9.6052	0.8114
1977	9.7344	08134
1978	13.1364	0.8585
1979	12.4600	0.8514
1980	13.4641	0.8617
1981	18.8130	0.8991
1982	16.0095	0.8824
1983	16.1575	0.8834
1984	14.5459	0.8714
1985	13.3722	0.8608
1986	12.2020	0.8485
1987	15.4267	0.8783
1988	19.7187	0.9034
1989	23.5996	0.9187
1990	23.3113	0.9177
1991	36.0883	0.9461
1992	44.2660	0.9558
1993	50.1654	0.9609
1994	27.8761	0.9307
1995	25.8179	0.9254
1996	32.1363	0.9396
1997	26.8850	0.9283
1998	31.5391	0.9385
1999	32.9317	0.9411
2000	36.3618	0.9465
2001	53.4545	0.9633
2002	39.8307	0.9510
2003	37.5205	0.9481
2004	43.5336	0.9551
2005	28.5247	0.9323
2006	29.9219	0.9353
2007	26,0698	0.9261
2008	26,6112	0.9276
2009	18.3463	0.8966
2010	22.8338	0.9161

Source: Authors' computation with data from FAOSTAT

Partial liberalization, reduction in export and farm taxes, abolition of farmer's quota and withdrawal of constraints on trading activities of private traders under the reformist government

attracted more exporters and intermediaries into the sector. Most farmers returned into production of coffee due to the relatively more favorable environment created under the reformist government, and smuggling was minimized due to the price incentive created through reduction in farm taxation. These factors boosted the country's performance in export of coffee in the early years of the reformist regime (between 1995 and 2001). During this period, RCA increased from 25.82 in 1995 to 53.45 in 2001, with RSCA also increasing from 0.93 in 1995 to 0.96 in 2001. Authorizing Cooperative Unions to engage in direct exports and sales without necessarily involving parastatals, and private exporters to engage in domestic marketing of coffee at market prices triggered an increase in the number of exporters and intermediaries in the supply chain from the year 2001 onwards. This led to an extensive supply chain involving numerous actors and processing activities, thereby widening the gap between time of purchase of beans from buyers and sales to exporters at the auction.

Along with this wide gap resulted a challenge with management of price risk due to the highly volatile nature of coffee prices. Quality control also became a challenge as interior control of quality was no more under the control of exporters as they were in the latter stages of the military regime. With minimum state supervision and increased ability of Cooperative Unions to engage in direct export, competition became unnecessarily high in both the primary and auction markets. The increasing number of actors and processes in the chain also led to increasing transaction costs. These resulted in a gradual decline in the country's export performance from the high RCA value of 53.45 in 2001 to 22.83 in 2010, with RSCA also decreasing from 0.96 in 2001 to 0.92 in 2010. The performance of the country in export of coffee has since the year 2002 taken on a declining trend in spite of the increases observed in world price of coffee between the years 2002 and 2007).

By these changes, it is noted that the performance of the country in export of coffee has under the various regimes been generally unsatisfactory. It was hindered by poor market structure, low productivity of grower's fields, and poor quality control under the imperial regime. Under the military regime, it was hindered by limited competition on the market, smuggling and drifting of most farmers from coffee production into the production of "Chat" due to high taxes on farmers' incomes, and by the collapse in world price of coffee. Under the imperial regime, it is hindered by challenges in management of price risk due to the wide gap between time of purchase of beans from growers and sales to exporters, quality control problems, unnecessary competition in both primary and auction markets due to the numerous players in the extensive supply chain, and by increasing transaction costs.

3.3   DETERMINANTS OF COFFEE EXPORT, PRODUCTION AND PRODUCER PRICE

As a vital step in the data generation process and in choosing the appropriate estimator, the whole set of data (with all variables in log except nominal rate of assistance (NRA) and foreign direct investment (FDI)) was verified through the Phillips-Perron unit root test. Output of the test shows that with the exception of the variable "exchange rate (EXR)", all the other variables specified in the three regression equations are non-stationary at level, but become stationary on first difference at the 1% level. The variable "exchange rate (EXR)" was found to be an $I(2)$ variable, implying that it becomes stationary on second difference, and is in the current study found stationary at the 1% level. To help capture its effects on coffee exports and prices however, the variable EXR was replaced with its first difference ($\Delta \ln EXR$). Having made all the variables $I(1)$ through this replacement, the respective equations were then estimated using the Ordinary Least Squares and tested for appropriate standard Gaussian properties. Results of the diagnostic tests on the Gaussian assumptions for the respective models indicate that the residual series for the respective models are normally distributed, homoscedastic and free from the problem of serial correlations.

Table 5:   Unit root test of variables (trend+ intercept at level, intercept at 1st and 2nd difference)

Series	PP-test stat Level	N-W Bandwidth	PP-test stat 1st and 2nd Diff.	N-W Bandwidth	Conclusion on Level
ln EX	-2.204377	1	-4.983489***	2	*I(1)*
ln PRO	-1.972720	0	-4.788677***	2	*I(1)*
ln CONS	-2.129521	0	-3.961341***	2	*I(1)*

NRA	-2.467563	1	-5.646206***	3	*I(1)*
ln EXR	-1.868880	2	-6.641161***	7	*I(2)*
ln PPR	-2.390771	3	-4.520276***	8	*I(1)*
FDI	-2.950608	5	-6.646939***	22	*I(1)*
ln ALF	-2.248686	0	-4.874804***	2	*I(1)*
ln YLD	-0.650916	2	-4.649091***	2	*I(1)*
ln RSCA	-1.907906	1	-3.946510***	1	*I(1)*
ln WCP	-2.306167	1	-4.578313***	0	*I(1)*
ln (WCP$_t$/DPPC$_t$)	-2.911759	0	-6.399812***	4	*I(1)*
Critical value (5%)	-3.612199	First difference	-2.998064		
		Second difference	-3.004861		

3.3.1 Determinants of coffee exports (EX)

The volume of coffee exported from Ethiopia is found to be significantly dependent on lagged domestic producer price, lagged world price (Brazilian Natural) to domestic producer price ratio, nominal rate of assistance, domestic consumption of coffee, foreign direct investment, and on lagged exchange rate. The intercept term had a positive coefficient significant at the 1% level, indicating that should all the other variables remain constant, Ethiopia will continue to export significant volumes of coffee green unto the international market.

Table 6: Determinants of coffee exports for Ethiopia

Variables	coefficients	standard error	t-statistic
Intercept	15.74279	4.647095	3.387663***
ln PPR$_{t-1}$	0.634617	0.184336	3.442723***
ln (WCP$_{t-1}$/PPR$_{t-1}$)	0.570133	0.192530	2.961267***
NRA$_t$	1.241461	0.658359	1.885691*
ln CONS$_t$	-0.658376	0.261957	-2.513301**
ln FDI$_t$	0.001033	0.000441	2.341297**
Δ ln EXR$_{t-1}$	1.120736	0.444415	2.521826**
ln PRO$_{t-1}$	0.007101	0.358721	0.019796
Adj. R^2	0.636234	Mean dependent var	11.42490
F-statistic	6.496930	S.D dependent var	0.340907
Prob. (F-statistic)	0.001209	S.E of regression	0.205611
Log likelihood	8.660724	Sum-squared resid	0.634138
Durbin-Watson stat	2.145649	Jarque-Bera	1.772691 (0.412159)
Akaike info criterion	-0.057454	B-G LM Test (1,2): 0.338(0.57); 1.668(0.227)	
Hannan-Quinn criter.	0.041876	ARCH Test, F-stat: 0.057 (0.8124)	
Schwarz criterion	0.337500	Q-stat(1,2): 0.257 (0.612); 2.125 (0.346)	
ADF Test of Residual	-4.998177***		

Lagged domestic producer price has a coefficient of 0.635, significant at the 1% level. This implies that export of coffee green in time *t* increases by 0.635% for a unit increase in domestic producer price in time *t-1*. With coffee production in Ethiopia being a low input activity (use is made mostly only of land, seed and labour), increases in producer price would help increase output through employment of more hands at harvest to ensure timely picking of adequate amount of berries and to expand current area under production (with accumulation of enough funds). More importantly, prices offered producers by buyers influence their decision on selling of the produce either on the domestic market or smuggling it into neighbouring countries for better prices. With smuggling having been identified as a major problem in the Ethiopian coffee industry by previous researchers (including Petit (2007), AMPD (2006), and ICO/CFC (2000)), increasing producer price could help minimize incidence of smuggling, thereby making more coffee beans available for processing and export.

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A unit increase in lagged world price to producer price ratio of coffee green leads to an increase of 0.570% in exports of coffee green, significant at the 1% level. A priori, the effect of an increase in this ratio was believed could go either way due to the fact that such increases are possible under four different scenarios (Boansi, 2013):

- Increases in world price, whiles domestic price is held constant
- Decreases in domestic price, whiles world price is held constant
- Increases in both, but more in world price than in domestic price
- Decreases in both, but more in domestic price than in world price

The positive and significant coefficient observed for the price ratio indicates that in as much as exporters would respond positively and significantly to increases in this ratio, any negative response on the part of growers (when victimized) is not significant. This reflects a high dependence of farmers on the crop for sustenance.

Nominal rate of assistance (government support to coffee producers reflected by the level of farm taxation) has a positive association (1.24) with export of coffee green, significant at the 10% level. Increasing government assistance to farmers through this variable reflects in decreasing taxation of farm incomes. Knowing they would earn a relatively higher income from sales with reduction in farm taxation, both garden coffee and plantation coffee growers, as well as forest and semi-forest coffee collectors are given a reason to invest much time and money in their fields and on labour to pick larger volumes of berries, thereby increasing supply on the market for both domestic consumption and exports. Decreasing farm taxation also helps in minimizing incidence of smuggling of coffee into neighbouring countries.

A unit increase in domestic consumption leads to a decrease of 0.658% in exports of coffee, significant at the 5% level. With Ethiopia regarded not only as a major producer and exporter of coffee, but also a major consumer in Africa, a unit increase in domestic consumption significantly decreases the volume available for both export and stock (to make up for future deficits). This effect of domestic consumption on exports could be mitigated by increasing domestic production at equivalent rate or above domestic consumption. Increasing domestic production at such rates does not necessarily translate into significant increases in export as export decisions of exporters depend not only on such rates but also on other vital local and international factors. This statement is made in support of the positive (0.007) yet insignificant coefficient observed for coffee production in the current study.

Foreign direct investment (FDI) has a coefficient of 0.001, significant at the 5% level. This implies that increases in foreign direct investment stimulate growth in export of coffee green. With Ethiopia's coffee production been considered a low input activity, foreign direct investment plays quite minimal roles on the input and production side, but on the broader perspective through international relations leads to trade creation. Investments in developing countries by foreign investors are mostly made in areas (sectors) in which the recipient countries have comparative advantage and such advantages are mostly exploited to further develop the areas/sectors (this however holds in cases where investments are made with an export-oriented motive as against a tariff jumping motive). Increasing foreign direct investment therefore serves as a greater opportunity for Ethiopia to increase its exports through benefits from trade creation resulting from such investment.

Devaluation of the Ethiopian currency through increases in the exchange rate is observed to stimulate growth in exports. Depreciation of the Ethiopian Birr against major international currencies makes exports cheaper and with such condition comes increased incentive to export larger volumes of the export commodity of interest (coffee for the current study). A lagged instead of current exchange rate is used in this study due to the auction system for sales of produce to exporters in the country under study (Ethiopia). An increase in the exchange rate in year *t-1* may stimulate growth in export if exporters are able to access enough coffee beans at the auction in that year. Success in accessing and exporting enough beans may result in increased profit for them and put the exporters in a better position to bid in the auction for higher volumes in the subsequent year. A unit increase in lagged exchange rate leads to an increase of 1.121% in Ethiopia's coffee exports. Of the total variations observed in exports of coffee green from Ethiopia, a total of about 63.62% are explained by variables specified in the equation on determinants of coffee exports, and the joint effect of these variables is significant at the 1% level.

3.3.2 Determinants of domestic producer price (PPR)

Domestic producer price of coffee is found to be significantly dependent on lagged domestic producer price, world price, lagged domestic consumption, lagged exports of coffee green, exchange rate, and on production of coffee in the current year. In contrast to observation on the intercept for equation 1 (determinants of coffee exports) however, the coefficient of the intercept for Table 7 is not significant. This implies that, without a significant change in any of the other variables, there would be no significant change in the domestic producer price of coffee green.

With buyers (*Sebsabys*) having no idea of the price they would receive for the coffee they sell later to the wholesalers (*Akrabies*), and by virtue of determination of market prices through a market mechanism instead of price fixing, prices received by growers from buyers are usually based on previous producer price and on the prevailing world price of coffee. These are the reasons why lagged producer price and current world price are used in equation 2 of section 2.3

Table 7:   Determinants of producer price for coffee green in Ethiopia

Variables	coefficients	standard error	t-statistic
Intercept	-6.891082	4.577254	-1.505505
$\ln PPR_{t-1}$	0.864542	0.162568	5.318043***
$\ln WCP_t$	0.268188	0.128155	2.092684*
NRA_t	0.699072	0.455635	1.534283
$\ln CONS_{t-1}$	0.524912	0.211815	2.478158**
$\ln EX_{t-1}$	0.976232	0.207386	4.707316***
$\Delta \ln EXR_t$	3.018723	0.463646	6.510841***
$\ln PRO_t$	-0.834563	0.340560	-2..450563**
Adj. R^2	0.859564	Mean dependent var	8.371907
F-statistic	21.11085	S.D dependent var	0.491458
Prob. (F-statistic)	0.000001	S.E of regression	0.184173
Log likelihood	11.41619	Sum-squared resid	0.542714
Durbin-Watson stat	1.665676	Jarque-Bera	0.278652 (0.869944)
Akaike info criterion	-0.284683	B-G LM Test (1, 2): 0.607 (0.448); 0.467 (0.636)	
Hannan-Quinn criter	-0.180503	ARCH Test, F-stat: 0.659 (0.426)	
Schwarz criterion	0.108002	Q-stat (1,2): 0.646 (0.421); 0.987 (0.610)	
ADF Test of Residual	-3.910603***		

A unit increase in lagged producer price leads to a 0.864% increase in current producer price of coffee, significant at the 1% level. A unit increase in world price of coffee green leads to a 0.268% increase in domestic producer price of coffee green, significant at the 10% level. The lower transmission of price increment in times of increasing world price reflects the extensive nature (many intermediaries) of the supply chain for coffee in Ethiopia and the strong effect of transaction cost. A unit increase in exchange rate leads to a 3.019% increase in domestic price of coffee, significant at the 1% level. An increase in exchange rate makes exports cheaper and results in increased demand for coffee beans for export. With increase in demand according to the theory of demand and supply, comes increase in price. In order to exploit benefits from devaluation of the currency (which signals likely increase in demand and higher prices from wholesaler (*Akrabies*) and exporters) buyers increase the price they pay growers by 3.019%.

Increases in demand reflected by both lagged domestic consumption and lagged exports have significant positive effects on producer price. An increase in lagged domestic consumption signals likely increase in conflict between domestic consumption and exports in the current year. To secure higher volumes for sales to the *Akrabies* and later to exporters, buyers increase the price they pay to growers by 0.525% and 0.976% respectively for unit increases in lagged domestic consumption and lagged export of coffee. Increase in supply *ceteris paribus* results in a decrease in producer price by 0.835%, significant at the 5% level. This observation is attributed to the market mechanism used in determining prices paid to growers by buyers in the country. In times of good harvest, buyers reduce

the price they pay to growers due to the surplus of berries on the market. The opposite however may be observed in times of scarcity to ensure securing sufficient beans from growers. Of the total variations observed in producer price of coffee in Ethiopia, a total of about 85.96% are explained by variables specified in the equation on determinants of domestic producer price of coffee, and the joint effect of all the variables on producer price is highly significant.

3.3.3 Determinants of coffee green production (PRO)

Production of coffee green is found to be significantly dependent on yield, lagged domestic producer price, lagged world price to domestic producer price ratio, nominal rate of assistance, comparative advantage of the country in coffee (measured by the RSCA) and two-period lag of agricultural labour force. The positive coefficient of the intercept term is found significant at the 1% level, implying that, should all the other variables remain constant, Ethiopian coffee growers will continue to produce significant amounts of coffee for both domestic consumption and exports. This reflects a high dependence of growers on coffee production for sustenance.

Table 8.0   Determinants of coffee production in Ethiopia

Variables	coefficients	standard error	t-statistic
Intercept	16.39730	1.291731	12.69405***
$\ln YLD_t$	0.604442	0.061595	9.813188***
$\ln PPR_{t-1}$	0.092097	0.042368	2.173764**
$\ln (WCP_{t-1}/PPR_{t-1})$	0.088140	0.037033	2.380039**
NRA_t	0.230725	0.121976	1.891552*
$\ln RSCA_t$	1.437157	0.586871	2.448848**
$\ln ALF_{t-2}$	-0.433864	0.131034	- 3.311087**
Adj. R^2	0.906070	Mean dependent var	12.19712
F-statistic	36.36954	S.D dependent var	0.148245
Prob. (F-statistic)	0.000000	S.E of regression	0.045434
Log likelihood	42.64216	Sum-squared resid	0.033028
Durbin-Watson stat	2.030585	Jarque-Bera	0.051949 (0.974360)
Akaike info criterion	-3.099318	B-G LM Test (1,2): 0.044(0.837); 0.026 (0.975)	
Hannan-Quinn criter.	-3.012404	ARCH Test, F-stat: 0.014(0.908)	
Schwarz criterion	-2.753733	Q-stat (1,2): 0.0180 (0.893); 0.0282 (0.986)	
ADF Test of Residual	-4.547153***		

     A unit increase in yield leads to a 0.604% increase in output, significant at the 1% level. Increase in output per unit area, reflects increased productivity of farmers' fields and a likely increase in the number of berries per tree. Increase in number of berries per tree (in times of low incidence of diseases and pests attack) in times of increased yield would most likely result in increased volume of output. But as to whether that increase is significant was initially not known. In the current study however, it is found that a unit increase in yield leads to a significant increase in output. Therefore, to increase volume of berries supplied for both domestic consumption and export, there would be a need to increase yield. Lag domestic producer price has a coefficient of 0.092, significant at the 5% level. This implies that for every unit increase in domestic producer price in the previous year, output in the subsequent year may increase by 0.092%. Increases in domestic producer price help growers to secure more farm hands at time of harvest in the subsequent year to help minimize loss of berries, expand the current area under cultivation and to ensure effective control of shocks in the form of diseases and pests attack in their fields.

     Lag world price to domestic price ratio has a coefficient of 0.088, significant at the 5% level. This implies that for every unit increase in the price ratio, production of coffee may increase by 0.088%. Under normal circumstances, production would be expected to decrease as farmers are mostly victimized in times of increases in this ratio. Their positive response through increase in output in

times of increasing world price to domestic price ratio once again affirms the high dependence of farmers on production and sales of the crop for sustenance. A decrease in tax levied on farmer's income through increase in nominal rate of assistance stimulates growth in production, significant at the 10% level. Decrease in farm taxation means relative increase in revenue for farmers from sales of their produce. Increase in revenue for farmers offers them an opportunity to effectively meet any vital production cost, most importantly control of diseases and pest. Increasing nominal rate of assistance also gives farmers incentives to sell their produce on the domestic market rather than smuggling it into neighbouring countries.. As a reflection of better conditions for production and assured market for produce, the index of competitiveness (the Relative Symmetric Comparative Advantage) has a coefficient of 1.437, significant at the 5% level. This implies that to ensure continuous growth in production of coffee, there is a need for Ethiopia to improve on its export performance, which would then translate into assured market for produce at relatively fairer price. An improvement in the country's competitiveness as well reflects addressing of inefficiencies in the subsector and mitigation of influences that could have significant negative impacts on production.

In contrast to the initial expectation however, agricultural labour force has a significant negative association with production. This reflects inefficient use of labour available in the country. Agricultural labour force has more than doubled between the years 1981 and 2010, but not so with the low areas of coffee and other cash and food crops harvested in the country. This phenomenon subsequently triggered off "a flower pot law" effect (law of diminishing marginal returns). To make better use of the increasing agricultural labour force, there is a need for area expansion in agricultural production most importantly for the coffee subsector, on which over 15 million people in the country depend for sustenance. Of the total variations observed for coffee production in Ethiopia, a total of about 90.61% are explained by variables specified in the equation on determinants of coffee production, and the joint effect of all the variables on production is highly significant

4.0   SYNTHESIS OF RESULTS AND RECOMMENDATIONS

The current study analyzed the competitiveness of Ethiopia in its exports of coffee green. In addition, it estimated the magnitude and effects of key economics determinant of coffee green exports, producer price and production. In analyzing competitiveness of the country in its exports of coffee, three distinct periods were considered, namely, years before 1974 (1961-73 for the current study - era of the imperial regime), 1974-1991 (era of a military rule with Marxist Ideological orientation) and from 1992 onwards (1992-2010 for the current study - era of a federal government system). The Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) measures of competitiveness were used for the analysis. Figures for the RCA and RSCA showed that Ethiopia has comparative advantage in exports of coffee green. Its performance however for the entire period (1961-2010) was found to be generally unsatisfactory.

Growth in the country's export performance has been hindered by challenges in management of price risk[2], problems with quality control, high transaction cost due to the extensive supply-chain and the numerous actors and processes therein, smuggling and unhealthy competition in both primary and auction markets, and by low productivity of growers' fields. To enhance its competitiveness in the coffee market amidst the anticipated increase in supply-side competition in the near future, measures should be put in place to address current inefficiencies in the supply chain most importantly with management of price risk, quality control, smuggling, and transaction costs. This could be achieved to a greater extent by reducing the gap between time of purchase of the berries/beans from buyers and the time they are auctioned, setting high quality standards for the beans taken to the auction markets and placing keen watch on those that are exported without going to the auction, ensuring payment of fairer prices to growers and appropriate transmission in times of increment, and by putting in place measures to reduce the number of intermediaries in the supply chain to help minimize unnecessary competition. In addition, appropriate investment should be made in yield-enhancing innovations.

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[2] Due to the volatile nature of coffee prices, both domestic and international and the wide gap between time of purchase of beans from buyers and sale of it to exporters

In considering the determinants of the respective strongholds (exports, producer price and production) of the coffee subsector, export of coffee was found to increase significantly with increases in lagged domestic producer price, lagged world price to domestic producer price ratio, nominal rate of assistance, foreign direct investment and exchange rate. The intercept term had a positive and significant coefficient at the 1% level, implying that *ceteris paribus*, Ethiopia will continue to export significant volumes of coffee onto the world coffee market. Export of coffee was found to decrease significantly with increases in domestic consumption. The adverse effect of consumption on export could be mitigated by increasing production at an equal rate as or above domestic consumption. Increasing output to help mitigate this effect does not necessarily translate into significant increases in export, as the coefficient of production (0.007) was found to be insignificant. Hence, we conclude that exports of coffee from Ethiopia depend much more on other internal and external factors than on production. These variables were found to explain about 63.62% of the variations observed in exports of coffee from Ethiopia and their joint effect was significant at the 1% level.

Producer price of coffee was also found to increase significantly with increases in lagged producer price, world price of coffee, exchange rate, lagged domestic consumption and lagged export of coffee. The intercept term had a negative coefficient, but was insignificant. Thus, without a significant change in any of the other variables, there would be no significant change in domestic producer price of coffee. Domestic producer price was found to decrease with increases in domestic production of coffee. A total of about 85.96% of the variations observed in domestic producer price of coffee green are explained by these variables and their joint effect is highly significant.

From our study, we also discovered that production of coffee green is directly proportional to yield, lagged domestic producer price, lagged world price to domestic price ratio, nominal rate of assistance, and to increases in the country's export performance for coffee (revealed symmetric comparative advantage). The intercept term had a positive coefficient, significant at the 1% level. This implies that, should all the other variables remain constant, Ethiopia would continue to produce significant volumes of coffee for domestic consumption and for export. Contrary to initial expectation however, domestic production was found to decrease with increasing availability of agricultural labour. This was attributed to a "flower pot law effect" due to the significant increase (doubling) in agricultural labour force observed between the years 1981 and 2010, the relatively low development in area harvested of coffee compared to the rate for labour force and to the low input use nature of coffee production in Ethiopia. To make efficient use of the available labour, there is a need to put in place measures to increase current area under cultivation.

By these estimates, growth in the coffee subsector could be enhanced by putting in place measures to help increase productivity of farmers' fields (yields), ensure continuous government support to the sector, increase competitiveness of the sector in terms of export performance and through continuous devaluation of the currency (this could however have adverse effect on sectors that rely more on imports), payment of fair prices to growers and ensuring appropriate transmission of future increments, attracting more export-oriented foreign direct investment and increasing current area under cultivation to ensure efficient utilization of the rapidly increasing agricultural labour force.

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APPENDICES

Table A.1   Nominal Rate of Assistance per country

Year	Brazil	Colombia	Ethiopia	Indonesia	Mexico	Nicaragua	Vietnam
1980	- 0.4337	- 0.2149	-	- 0.0754	- 0.0668	-	-
1981	- 0.4337	- 0.2008	- 0.1511	- 0.0526	- 0.8387	-	-
1982	- 0.4083	- 0.2208	- 0.2643	- 0.0394	- 0.9253	-	-
1983	- 0.5745	- 0.2122	- 0.3542	- 0.13	- 0.9331	-	-
1984	- 0.5316	- 0.2704	- 0.3724	- 0.1344	- 0.9461	-	-
1985	- 0.2655	- 0.2952	- 0.4571	- 0.0873	0.0677	-	-
1986	0.0463	- 0.2370	- 0.2251	- 0.0416	- 0.6808	-	- 0.5804
1987	- 0.4345	- 0.0549	- 0.3418	0.0613	- 0.7029	-	- 0.7355
1988	- 0.4589	- 0.2837	- 0.4066	0.0115	- 0.8438	-	- 0.3619
1989	- 0.1391	- 0.1028	- 0.2025	- 0.0561	- 0.3265	-	- 0.2967
1990	- 0.1932	- 0.0323	- 0.3154	- 0.0239	- 0.0556	-	- 0.3423
1991	- 0.2329	- 0.0302	- 0.3876	0.0099	- 0.1263	- 0.4408	- 0.2674
1992	0.1966	0.1665	- 0,4278	0.0050	- 0.2601	- 0.2593	- 0.206
1993	0.2586	- 0.0461	- 0.3855	0.0016	- 0.2836	- 0.2032	- 0.1154
1994	0.5302	- 0.3633	- 0.4093	- 0.0185	- 0.4547	- 0.4197	- 0.1231
1995	0.0279	- 0.2954	- 0.3934	- 0.0151	- 0.5485	- 0.6157	- 0.0982
1996	0.0461	- 0.1749	- 0.4233	0.0578	- 0.2233	- 0.3687	- 0.0029
1997	0.1049	- 0.2638	- 0.3905	0.0451	- 0.3167	- 0.5287	- 0.0228
1998	0.1041	- 0.1943	- 0.3386	- 0.0116	- 0.3245	- 0.5876	- 0.1512
1999	0.0573	- 0.1435	- 0.2765	0.0386	0.0093	- 0.4252	- 0.0776
2000	0.0361	- 0.1148	- 0.1456	0.0700	- 0.3526	- 0.3053	- 0.0742
2001	0.0515	0.1774	- 0.0431	0.0363	- 0.339	- 0.1434	- 0.1614
2002	0.1932	0.2463	0.0204	0.0117	- 0.2797	- 0.0651	- 0.158
2003	0.0302	0.0946	- 0.0998	0.0013	- 0.2707	- 0.4406	- 0.0858
2004	0.0425	- 0.0377	- 0.0721	0.0306	- 0.4499	- 0.1856	-
2005	0.0250	0.0084	- 0.0326	- 0.2215	0.1135	- 0.7194	-
2006	0.0356	- 0.0038	- 0.084	- 0.1958	0	- 0.3369	-
2007	0.0318	0.0075	- 0.035	- 0.1908	0	- 0.7403	-
2008	0.0014	- 0.0141	- 0.0299	- 0.1109	0	- 0.6401	-
2009	0.0008	0.1198	0.0680	0.1183	0	- 0.746	-

Source: Anderson and Nelgen (2012)

Table A.2   GLOBAL PERFORMANCE IN COFFEE GREEN EXPORTS

Year	Brazil		Colombia		Costa Rica		Ethiopia		Guatemala		Honduras	
	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA
1961	10.53	0.83	15.07	0.88	9.97	0.82	10.25	0.82	11.50	0.84	2.69	0.46
1962	11.27	0.84	15.21	0.88	10.45	0.83	10.80	0.83	11.52	0.84	3.22	0.53
1963	11.47	0.84	15.78	0.88	9.85	0.82	10.09	0.82	10.62	0.83	4.05	0.60
1964	10.86	0.83	14.90	0.87	8.38	0.79	10.49	0.83	8.58	0.79	3.93	0.59
1965	10.57	0.83	15.45	0.88	9.40	0.81	13.00	0.86	10.77	0.83	4.00	0.60
1971	8.37	0.79	15.41	0.88	7.30	0.76	12.44	0.85	10.06	0.82	3.31	0.54
1972	7.54	0.77	14.15	0.87	7.43	0.76	10.42	0.82	9.42	0.81	3.90	0.59
1973	6.74	0.74	16.45	0.89	8.15	0.78	8.89	0.80	10.63	0.83	6.46	0.73
1974	5.03	0.67	18.45	0.90	11.15	0.84	8.17	0.78	12.10	0.85	8.59	0.79
1975	5.27	0.68	18.47	0.90	8.23	0.78	10.92	0.83	10.86	0.83	10.19	0.82
1981	4.49	0.64	19.26	0.90	10.39	0.82	18.81	0.90	10.46	0.83	8.59	0.79
1982	5.50	0.69	17.24	0.89	9.52	0.81	16.01	0.88	11.16	0.84	7.32	0.76
1983	5.40	0.69	17.42	0.89	9.04	0.80	16.16	0.88	10.74	0.83	7.24	0.76
1984	5.17	0.68	16.07	0.88	8.41	0.79	14.55	0.87	8.73	0.79	6.61	0.74
1985	4.85	0.66	14.83	0.87	9.75	0.81	13.37	0.86	9.31	0.81	6.22	0.72

1991	8.61	0.79	26.26	0.93	13.96	0.87	36.09	0.95	17.89	0.89	13.05	0.86
1992	7.11	0.75	33.18	0.94	12.12	0.85	44.27	0.96	20.19	0.91	14.78	0.87
1993	6.43	0.73	28.13	0.93	9.00	0.80	**50.17**	**0.96**	18.79	0.90	15.37	0.88
1994	6.37	0.73	21.01	0.91	8.86	0.80	27.88	0.93	12.02	0.85	16.10	0.88
1995	5.32	0.68	19.82	0.90	9.47	0.81	25.82	0.93	14.90	0.87	22.63	0.92
2001	5.73	0.70	21.78	0.91	8.94	0.80	**53.45**	**0.96**	17.40	0.89	26.31	0.93
2002	6.22	0.72	24.96	0.92	10.49	0.83	39.83	0.95	17.25	0.89	30.78	0.94
2003	5.73	0.70	26.49	0.93	11.01	0.83	37.52	0.95	19.82	0.90	29.99	0.94
2004	5.45	0.69	24.03	0.92	9.14	0.80	43.53	0.96	18.69	0.90	29.90	0.94
2005	5.48	0.69	22.74	0.92	8.79	0.80	28.52	0.93	16.21	0.88	26.19	0.93
2006	5.32	0.68	19.70	0.90	6.70	0.74	29.92	0.94	15.12	0.88	29.46	0.93
2007	5.07	0.67	19.77	0.90	6.48	0.73	26.07	0.93	13.62	0.86	28.64	0.93
2008	4.78	0.65	19.08	0.90	6.83	0.74	26.61	0.93	13.28	0.86	26.53	0.93
2009	4.70	0.65	17.91	0.89	5.35	0.69	18.34	0.90	11.60	0.84	27.70	0.93
2010	5.03	0.67	20.53	0.91	4.94	0.66	22.83	0.92	11.39	0.84	26.90	0.93

Source: Authors' computation with data from FAOSTAT

NB: RCA- Revealed Comparative Advantage

 RSCA- Revealed Symmetric Comparative Advantage

Table A.3   GLOBAL PERFORMANCE IN COFFEE GREEN EXPORTS (CONTINUED)

Year	India		Indonesia		Mexico		Nicaragua		Peru		Vietnam	
	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA
1961	0.63	- 0.23	0.51	- 0.32	2.72	0.46	5.72	0.70	2.17	0.37	0.02	- 0.96
1962	0.47	- 0.36	0.54	- 0.30	2.37	0.41	3.82	0.58	2.19	0.37	0.07	- 0.86
1963	0.42	- 0.41	0.86	- 0.08	1.76	0.27	3.68	0.57	2.33	0.40	0.08	- 0.86
1964	0.67	- 0.20	1.09	0.04	2.70	0.46	3.39	0.54	2.92	0.49	0.19	- 0.68
1965	0.64	- 0.22	1.53	0.21	1.99	0.33	3.92	0.59	3.10	0.51	0.39	- 0.44
1971	0.84	- 0.08	2.33	0.40	2.41	0.41	4.39	0.63	4.54	0.64	0.91	- 0.05
1972	0.88	- 0.06	3.39	0.54	2.07	0.35	3.67	0.57	5.13	0.67	1.31	0.13
1973	1.34	0.14	2.33	0.40	3.56	0.56	4.89	0.66	5.83	0.71	2.35	0.40
1974	1.27	0.12	2.76	0.47	4.09	0.61	4.80	0.66	3.15	0.52	2.22	0.38
1975	1.27	0.12	3.43	0.55	5.67	0.70	5.26	0.68	3.39	0.54	1.83	0.29
1981	1.84	0.30	5.26	0.68	5.59	0.70	9.72	0.81	12.96	0.86	1.01	0.01
1982	1.88	0.30	5.14	0.67	5.78	0.71	8.91	0.80	9.74	0.81	0.79	- 0.12
1983	1.48	0.20	4.81	0.66	6.18	0.72	7.85	0.77	11.12	0.83	0.63	- 0.23
1984	1.48	0.20	4.83	0.66	5.12	0.67	7.51	0.77	10.00	0.82	0.60	- 0.25
1985	1.73	0.27	4.33	0.62	5.53	0.69	8.91	0.80	9.27	0.81	1.25	0.11
1991	2.07	0.35	5.90	0.71	5.92	0.71	8.65	0.79	16.64	0.89	6.12	0.72
1992	2.52	0.43	4.63	0.64	5.96	0.71	17.51	0.89	15.81	0.88	7.44	0.76
1993	2.40	0.41	5.52	0.69	4.30	0.62	12.26	0.85	11.94	0.85	7.75	0.77
1994	3.16	0.52	5.54	0.69	3.54	0.56	11.63	0.84	14.12	0.87	9.31	0.81
1995	2.42	0.42	3.97	0.60	4.83	0.66	15.53	0.88	18.78	0.90	12.81	0.86
2001	2.21	0.38	3.19	0.52	2.45	0.42	20.41	0.91	21.32	0.91	14.73	0.87
2002	2.25	0.38	3.07	0.51	2.08	0.35	16.36	0.88	21.15	0.91	13.26	0.86
2003	2.22	0.38	3.31	0.54	1.90	0.31	20.23	0.91	19.3	0.90	18.67	0.90
2004	1.89	0.31	2.56	0.44	1.68	0.25	21.13	0.91	21.62	0.91	16.36	0.88
2005	1.89	0.31	3.06	0.51	1.39	0.16	14.28	0.87	15.14	0.88	13.69	0.86
2006	1.76	0.28	2.58	0.44	1.46	0.19	24.60	0.92	17.92	0.89	17.88	0.89
2007	1.26	0.12	2.32	0.40	1.58	0.22	14.29	0.87	13.73	0.86	21.76	0.91
2008	1.38	0.16	2.28	0.39	1.41	0.17	15.53	0.88	15.71	0.88	17.59	0.89
2009	1.10	0.05	2.56	0.44	1.55	0.22	15.19	0.88	15.55	0.88	15.58	0.88
2010	1.15	0.07	1.59	0.23	1.28	0.12	15.82	0.88	16.76	0.89	10.72	0.83

Source: Authors' computation with data from FAOSTAT

Table A.4   Share of coffee green exports in total agricultural exports

	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010
Brazil					
Coffee green exports (1000$)	756,213	1,554,661	1,909,404	1,819,173	2,735,490
Total Agricultural exports (1000$)	1,363,471	5,506,883	8,984,488	12,477,373	35,963,225
Share of coffee green in agric. exports (%)	**55.46**	**28.23**	**21.25**	**14.58**	**7.61**
Colombia					
Coffee green exports (1000$)	349,376	1,153,364	1,721,965	1,569,299	1,336,358
Total Agricultural exports (1000$)	425,735	1,517,970	2,377,168	3,131,459	4,403,401
Share of coffee green in agric. exports (%)	**82.06**	**75.98**	**72.44**	**50.11**	**30.35**
Ethiopia					
Coffee green exports (1000$)	58,533	158,882	245,541	245,159	354,108
Total Agricultural exports (1000$)	94,457	262,382	362,894	320,310	871,318
Share of coffee green in agric. exports (%)	**61.97**	**60.55**	**67.66**	**76.54**	**40.64**
Indonesia					
Coffee green exports (1000$)	35,265	300,652	500,451	475,694	527,667
Total Agricultural exports (1000$)	407,165	1,353,130	2,483,192	4,761,069	14,942,913
Share of coffee green in agric. exports (%)	**8.66**	**22.22**	**20.15**	**9.99**	**3.53**
Vietnam					
Coffee green exports (1000$)	937	4,167	37,543	379,863	1,139,974
Total Agricultural exports (1000$)	42031	64,821	320,813	1,665,048	4,886,225
Share of coffee green in agric. exports (%)	**2.23**	**6.43**	**11.70**	**22.81**	**23.33**
Guatemala					
Coffee green exports (1000$)	79,798	283,148	374,833	444,471	464,417
Total Agricultural exports (1000$)	153,789	590,940	795,114	1,215,376	2,233,914
Share of coffee green in agric. exports (%)	**51.89**	**47.91**	**47.14**	**36.57**	**20.79**
Honduras					
Coffee green exports (1000$)	17,668	108,022	191,830	251,166	383,283
Total Agricultural exports (1000$)	98,250	305,249	588,053	532,383	939,327
Share of coffee green in agric. exports (%)	**17.98**	**35.39**	**32.62**	**47.18**	**40.80**
Peru					
Coffee green exports (1000$)	30,742	107,630	139,554	210,176	420,087
Total Agricultural exports (1000$)	179,940	313,968	290,140	544,715	1,687,920
Share of coffee green in agric. exports (%)	**17.08**	**34.28**	**48.10**	**38.58**	**22.89**
India					
Coffee green exports (1000$)	23,149	118,367	182,513	244,640	251,992
Total Agricultural exports (1000$)	640,824	1,564,595	2,448,116	4,415,698	11,420,725
Share of coffee green in agric. exports (%)	**3.61**	**7.57**	**7.46**	**5.54**	**2.21**
Mexico					
Coffee green exports (1000$)	74,019	284,545	464,511	570,229	274,792
Total Agricultural exports (1000$)	624,446	1,293,411	2,086,274	5,261,081	12,010,188
Share of coffee green in agric. exports (%)	**11.85**	**22.00**	**22.27**	**10.84**	**2.29**
Nicaragua					
Coffee green exports (1000$)	21,598	106,333	106,099	94,862	174,156
Total Agricultural exports (1000$)	104,843	339,649	273,330	275,228	702,514
Share of coffee green in agric. exports (%)	**20.60**	**31.31**	**38.82**	**34.47**	**24.79**
Costa Rica					
Coffee green exports (1000$)	52,401	183,820	284,035	305,492	232,853
Total Agricultural exports (1000$)	112,040	432,666	687,096	1,383,471	2,242,393
Share of coffee green in agric. exports (%)	**46.77**	**42.49**	**41.34**	**22.08**	**10.38**
World					
Coffee green exports (1000$)	2,290,036	7,347,556	9,784,229	9,466,732	10,701,555
Total Agricultural exports (1000$)	41,179,390	135,838,122	248,044,908	404,513,254	732,868,728
Share of coffee green in agric. exports (%)	**5.56**	**5.41**	**3.94**	**2.34**	**1.46**

Source: Authors' computation with data from FAOSTAT