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Analysis of price incentives for wheat in Ethiopia for the time period 2005-2012

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Monitoring and Analysing Food and Agricultural Policies (MAFAP)

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CONTENTS

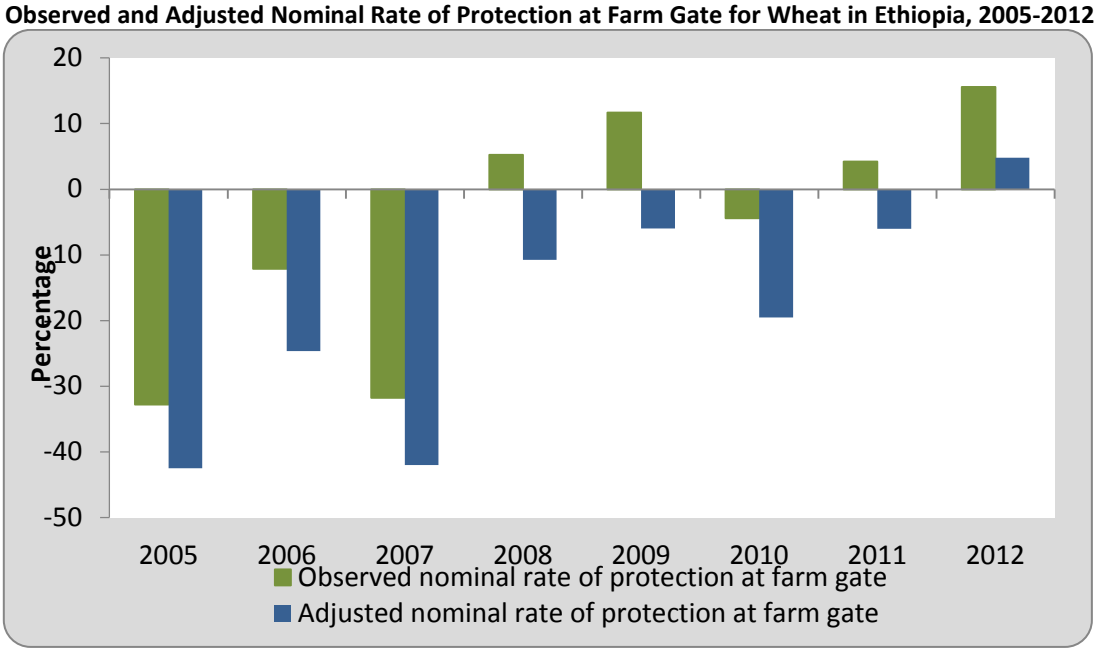
SUMMARY OF THE NOTE

Product: Wheat
Period analyzed: 2005 - 2012
Trade status: Import (m)

COMMODITY CONTEXT

- Wheat accounts for the fourth largest share of total cereal production in Ethiopia.
- Ethiopia is the second largest wheat producer in sub-Saharan Africa. 3.43 million tonnes were harvested in 2012. White wheat, which is commonly used for bread, constitutes about 80 percent of wheat production in Ethiopia, while durum wheat, often used for pasta and macaroni, makes up most of the remainder.
- Wheat production area expanded from 1.46 million ha in 2005 to 1.63 million ha in 2012.
- Though productivity is increasing in Ethiopia, yield per hectare is only a quarter of the highest yielding countries.
- Wheat accounted for about 13 percent of the per capita calorie intake in 2005 and 15 percent in 2009, making it the second most consumed cereal in Ethiopia, next to maize.
- Wheat is the single most important staple imported from abroad, and a record quantity of 1.11 million tonnes was imported in 2009.
- Wheat producers in Ethiopia consume 59 percent, sell 20 percent, and retain 17 percent of what they produce for seed, on average.
- Over the eight-year period, the price of wheat has increased almost 300 percent. The wholesale price of wheat at Addis Ababa market (point of competition) has increased from 1,975 to 7,045 Ethiopian Birr (+257 percent) and the farm gate price from 1,713 ETB to 6,709 ETB (+292 percent).
- The majority of humanitarian food aid and commercial imports take the form of wheat.
- The wheat value chain is very long and involves many small operators.

Observed and Adjusted Nominal Rate of Protection at Farm Gate for Wheat in Ethiopia, 2005-2012



Source: MAFAP, 2014

The observed Nominal Rate of Protection (NRP, green bars) in the graph above measures the effect of policy distortions and overall market performance on price incentives for producers. The adjusted NRP (blue bars) captures the same elements as the observed NRP, in addition to any market distortions resulting from inefficiencies in the commodity's value chain and exchange rate misalignment. The difference between the two bars reflects the estimated cost that value chain inefficiencies and exchange rate misalignment represent to producers.

DRIVING FACTORS

- Our results show that disincentives in the adjusted domain, were substantial during the period 2005 to 2007, but got closer to zero during the following years, and even turned into minor incentives in 2012. These disincentives arose from i) overvalued exchange rate; ii) export ban on cereals and restriction on private imports (restricted access to foreign exchange); iii) distribution of imported wheat at subsidized prices; and, iv) underdeveloped market structure and high transport costs.
- On the other hand, the reduced disincentives (or increased incentives) after 2007 were due to i) falling exchange rate gaps in 2009 and 2012; ii) stable and relatively lower access costs compared to previous years; and, iii) relatively lower imports than in 2011 and higher outputs and yields in 2012.
- The finding indicates that the disincentives/incentives are lower/higher at farm gate than at point of competition.
- Despite the disincentives, wheat production increased over the 2008-2012 period, with an average 6.8 percent expansion of area under cultivation and 19 percent increase in yield.

RECOMMENDATIONS

- Actions to be taken to reduce disincentives could include i) addressing currency overvaluation; ii) avoiding non-targeted distribution of grain at subsidized prices; iii) supporting the development of market structures and the grain value chain; iv) promoting the use of bulk transport systems; and, v) purchasing wheat from domestic producers, as opposed to importing whenever food aid/assistance is required. In order for the currency devaluation to be efficient and correspond to lower disincentives, the wheat value chain has to become more competitive and be tradable on the international markets. If not, the devaluation will increase disincentives by leading to higher prices for imported inputs, such as fertilizers.
- Ease the delivery process for the producers, through such avenues as cooperatives or consumer associations, rather than going through brokers who charge additional fees.
- In 2010, the export ban was not in place and wheat was exported to neighbouring countries; wheat production increased, suggesting that the restrictive trade policy had a hindering effect on production.
- Exporting wheat to neighbouring countries may be advantageous for Ethiopia when international prices are too low to export to other countries. According to the ATA, domestic production is increasing but the marketable surplus remains at 20 percent; this share could increase if exports to neighbouring countries were allowed.
- Though the government is upgrading and improving the overall level of infrastructure in the country, greater attention should be paid to introducing bulk transport systems, along with

grades and standards to reduce transport and transaction costs and provide better incentives to farmers; this would also improve opportunities for wheat to be traded at the Ethiopian Commodity Exchange. Continued investment in heavy infrastructure, such as highways and railways, would reduce high access costs prohibiting grain trade and generating price disincentives.

- Government policy should be informed that low domestic prices are good for consumers only in the short run. Long-term and sustained gain to consumers can only be achieved by improving producers' incentives, which translates into increased production, hence lower prices in the long run (Demeke and Di Marcantonio, 2013). Even low-income consumers are shifting towards wheat consumption with the increasing price of *teff*, urging support for wheat producers through export promotion and reduced price disincentives.
- Modernization of information technology (IT) and investment in both physical and human resources to manage these services for traders, and installing modern loading and unloading equipment in grain markets (to overcome the increasing cost of labour), are essential. An advanced information system with recent data on the production quantity of wheat and other grains (side-by-side with the one estimated by CSA) could provide policy makers with the precise quantity produced in a particular season and help them decide on exports and imports.

1. PURPOSE OF THE NOTE

This technical note is an attempt to measure, analyze and interpret price incentives for wheat in Ethiopia over the period 2005-2012.

For this purpose, yearly averages of domestic farm gate and wholesale prices are compared with reference prices calculated on the basis of the price of the commodity in the international market. The price gaps between reference prices and domestic prices along the commodity's value chain indicate the extent to which incentives (positive gaps) or disincentives (negative gaps) were present at the farm gate and wholesale level. The price gaps are expressed in relative terms as a percentage of the reference price, referred to as the Nominal Rate of Protection (NRP). These key indicators are used by MAFAP to assess the effects of policy and market performance on prices.

This technical note begins with a review of the commodity's production, consumption/utilization, marketing and trade, value chain and policy context (Chapter 2). It also provides a detailed description of how key data elements were obtained and indicators were calculated (Chapter 3). The indicators were then interpreted in light of existing policies and market characteristics (Chapter 4), and key policy recommendations were formulated on the basis of this interpretation (Chapter 5). Finally, the note concludes with a few main messages, limitations of the analysis and areas identified for further research to improve the analysis (Chapter 6).

The results and recommendations presented in this analysis of price incentives can be used by stakeholders involved in policy-making for the food and agriculture sector. They can also serve as input for evidence-based policy dialogue at the national, regional or international level.

This technical note should not be interpreted as an in-depth value chain analysis or detailed description of the commodity's production, consumption/utilization, marketing and trade or policy context. All information related to these areas is presented merely to provide background on the commodity under review, help understand major trends and facilitate the interpretation of the indicators.

All information in this technical note is subject to review and validation.

2. COMMODITY CONTEXT

Ethiopia is the leading wheat producer in sub-Saharan Africa. In 2012, wheat production totaled 3.4 million tonnes (FAOSTAT), representing more than half of that produced in Sub-Saharan Africa and about 13.8 percent in all of Africa. Most of the wheat grown in Ethiopia is bread wheat, followed by durum wheat, which is often grown mixed with bread wheat.

CSA data indicates that wheat is among the most important crops in Ethiopia, ranking fourth in total cereal production (17.5 percent during 2005-2012) next to maize, sorghum and teff. It is grown as a staple food in the highlands at altitudes ranging from 1500 to 3000 meters above sea level. Nearly all wheat in the country is produced under rain-fed conditions, predominantly by small farmers. Smallholder farmers have a share of about 92 percent of the area allocated for wheat (USDA, 2013), with the remainder cultivated by a few government-owned, large-scale (state) farms and commercial farms that also produce wheat. Despite the recent expansion, Ethiopia falls short of being self-sufficient in wheat production, and continually remains a net importer.

The importance of wheat in production, trade and consumption stimulates a national interest for it. Wheat's share in total crop production is about 17.5 percent and its area share is nearly 17 percent. Similarly, wheat's share in households' total calorie intake at the national level is 15 percent, ranking second among cereal crops, next to maize.[1] The deficit in national production has continually provoked increasing imports, averaging nearly 1.06 million tonnes annually since 2008. This magnifies the importance of wheat for food security in Ethiopia. Of the nearly 12.5 million smallholder farmers, 37 percent produce wheat on a total area of 1.6 million hectares. However, the lack of modern production technology and irrigation, coupled with unpredictable climate, has so far resulted in low yields in relation to wheat production elsewhere and the potential of Ethiopia itself. Furthermore, several factors inhibit the incentive for farmers to produce wheat such as lack of market, transport and communications infrastructure, as well as lack of input technologies (fertilizer and improved seed). On the other hand, the Government of Ethiopia, according to the GTP and other strategy documents and plans, envisages increased volumes of cereal production to decrease food insecurity and poverty. The analysis of MAFAP, enabled by the use of empirical data, is essential to better understand the issues surrounding wheat as a major cereal crop, and to promote strategies that encourage production by smallholder farmers. The selection of wheat as a commodity of MAFAP analysis also emanates from its dominance in production, consumption and cereal trade in Ethiopia.

PRODUCTION

In terms of production area and yield, wheat ranks fourth among all food crops in Ethiopia (Table 1). Wheat production increased 55 percent, from 2.2 million tonnes in 2005 to 3.4 million tonnes in 2012 (CSA, 2012). However, the share of wheat in total cereal area decreased by 6.2 percent over the same period, mainly due to a shift in cropping patterns towards sorghum, maize, millet and other cereal crops (Table 1). Wheat yield in Ethiopia is also lagging behind other major producers in Africa, with an average yield of 2.11 tonnes per ha in 2012, which is about 41 percent below Kenya and 77 percent below South African averages (FAOSTAT). The low productivity can be attributed to several

[1] In **2009**, wheat was the second most consumed grain, accounting for 322 kcal/capita/day or 15percent (2nd to maize at 418 kcal). For more information, see http://wheatatlas.org/country/ETH/

factors, including slow progress in developing wheat cultivars with durable resistance to diseases, depleted soil fertility and lack of improved seed, and fertilizer intensity rate. From 1997/98 to 2006/07, fertilizer was applied to only 61 percent, improved seed to 4 percent and only 0.3 percent of the wheat producing area was irrigated. This clearly indicates the reasons behind low productivity but more importantly, the potential for growth.

Table 1: Area, Production and Yield of Cereals in Ethiopia, 2005-2012

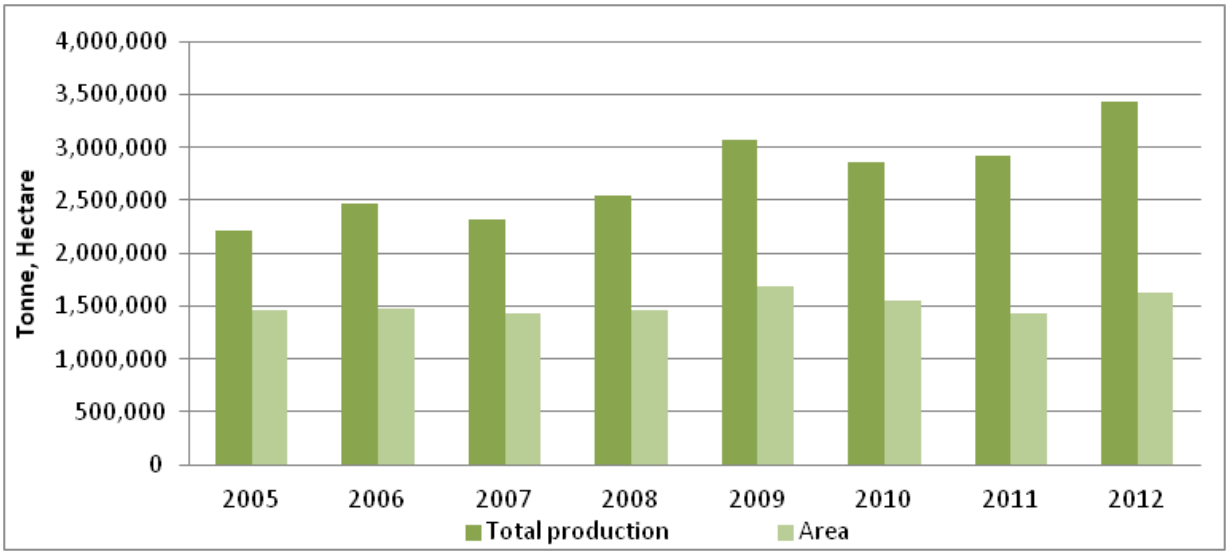
Crop	2005				2012				Expansion rate				Average yield (2005-12)*
	Area '000 ha	Prod. '000 tonnes	Yield tonnes /ha	Area Share (%)	Area '000 ha	Prod. '000 tonnes	Yield tonnes /ha	Area Share	Area '000 ha	Prod. '000 tonnes	Yield tonnes /ha	Area share	
Barley	997	1270	1.3	12.3	1019	1782	1.7	10.6	2.2	40.3	30.8	-13.8	15.2
Maize	1526	3336	2.2	18.9	2013	6158	3.1	21.0	31.9	84.6	40.9	11.1	24.4
Millet	333	397	1.2	4.1	432	742	1.7	4.5	29.7	86.9	41.7	9.8	14.3
Sorghum	1468	2173	1.5	18.2	1711	3604	2.1	17.8	16.6	65.9	40.0	-2.2	18.3
Teff	2246	2176	1.0	27.8	2730	3765	1.4	28.4	21.5	73.0	40.0	2.2	11.9
Wheat	**1459**	**2219**	**1.5**	**18.1**	**1628**	**3435**	**2.1**	**17.0**	**11.6**	**54.8**	**40.0**	**-6.1**	**18.0**
Other	50.6	51.4	1.0	0.6	68	165	2.4	0.7	34.4	221.0	140.0	16.7	19.4
Total cereal	8081	11624	1.4	100.0	9601	19651	2.0	100	18.8	69.1	42.9	0.0	17.6

Source: Authors' calculation using CSA data (various years)

Wheat production, in terms of volume and area, increased over the period 2005-2012. The production of 3.4 million tonnes in 2012, a record output, made Ethiopia the leading producer of wheat in Sub-Saharan Africa and third on the continent, next to Egypt and Morocco. Neighboring countries produce far less wheat and given Ethiopia's vast land resources, increasing use of modern input technology, irrigation and improved infrastructure (resulting in improved yields), it has great potential to benefit from exporting wheat to neighboring countries.

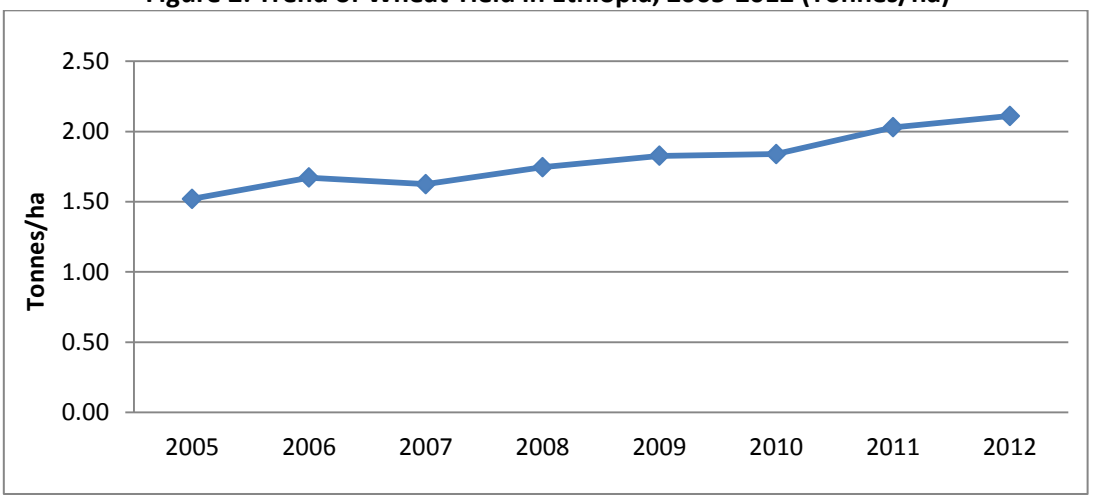
The trend from 2005-2012 clearly demonstrates that although the total area has remained relatively stable, production has increased (Figure 1). This indicates that production increased due to productivity resulting in higher yields (Figure 2), not area expansion. The more dramatic increase in yield from 2010 is likely due to increased use of improved inputs, as well as favorable weather conditions. Although wheat yields increased about 39 percent between 2005 and 2010, from 1.52 tonnes.ha^{-1} to 2.2 tonnes.ha^{-1}, Ethiopian wheat yields are quite low relative to other Sub-Saharan African countries (Figure 3).

Figure 1: Trend of Quantity of Wheat Produced and Area in Ethiopia, 2005-2012 (Tonnes/hectare)



Source: CSA data, 2011/12

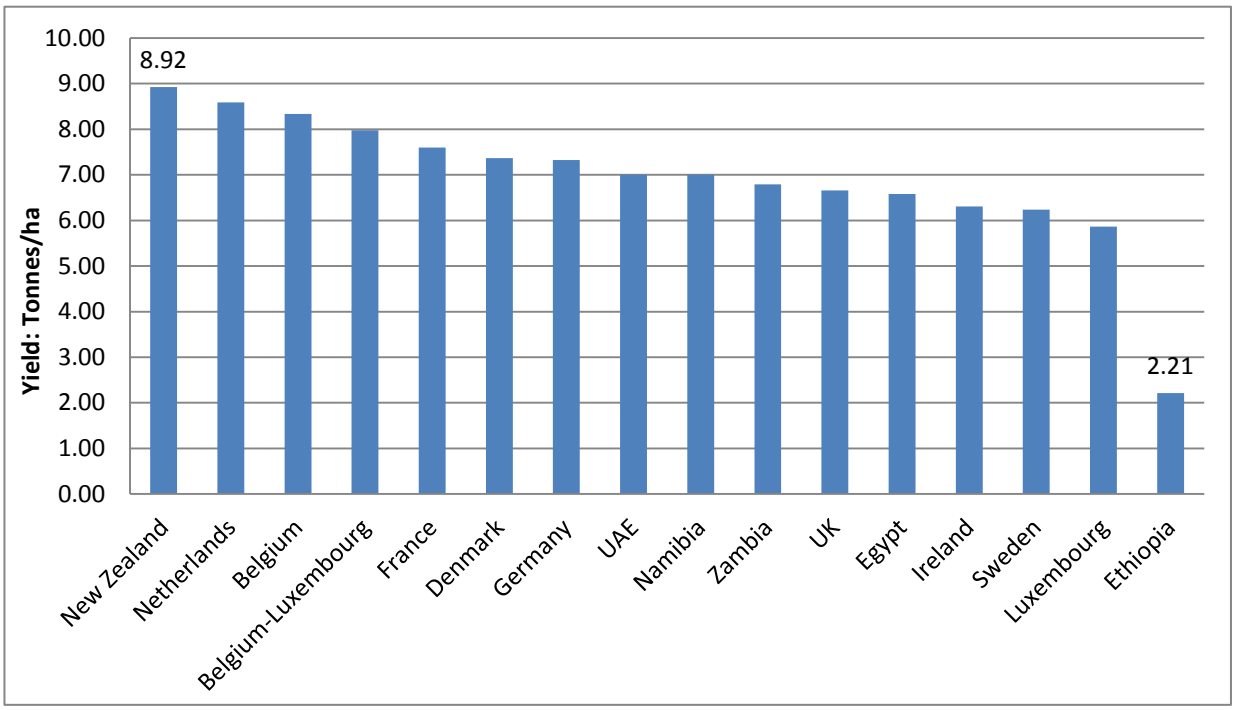
Figure 2: Trend of Wheat Yield in Ethiopia, 2005-2012 (Tonnes/ha)



Source: Author's computation from Countrystat, 2013

The top 15 wheat-yielding countries in 2012 are listed in Figure 3 (FAOSTAT). Ethiopia ranks 80th in wheat yield, which is four times lower than New Zealand, leading with 8.92 tonnes per hectare. Beyond agro-climatic and political factors contributing to lower yields, technology could play a more dominant role in productivity, enabling Ethiopia to enhance its yields and achieve at least a sufficient yield to feed and change the living standard of its growing population.

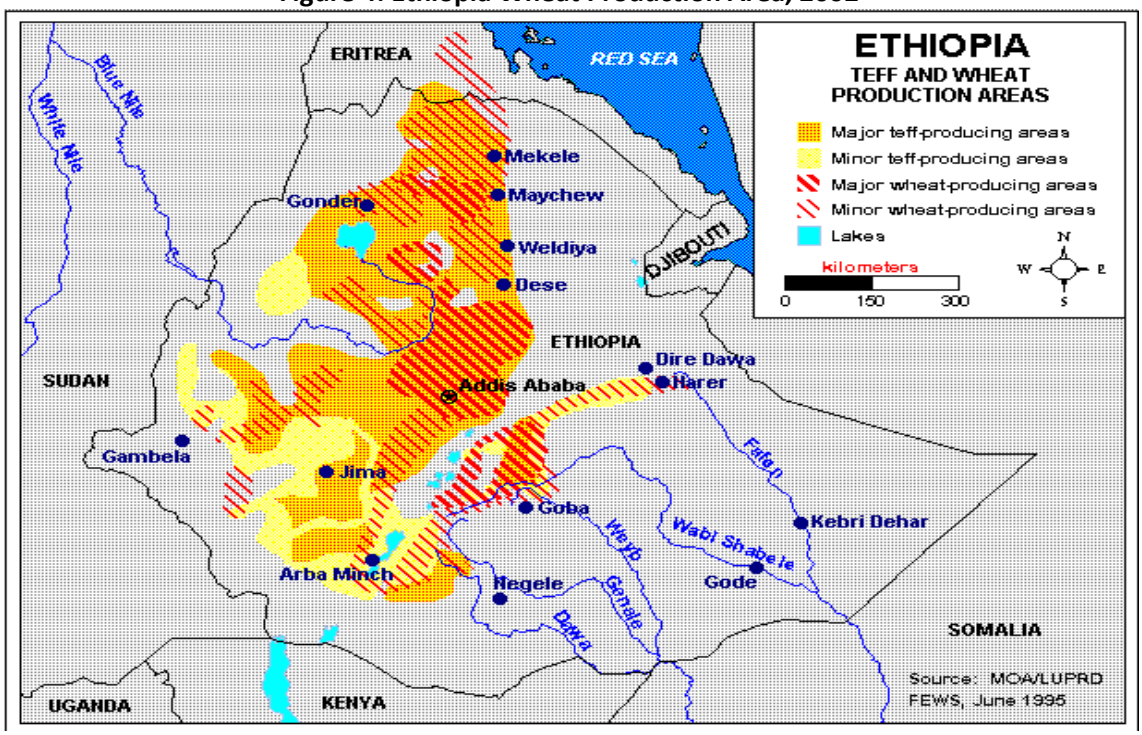
Figure 3: Global Comparison of Wheat Yield, 2012 (Tonnes/ha)



Source: FAOSTAT, 2012

Wheat is grown during the major cropping season, known as *meher,* from June to September because of the high rainfall and suitable temperature and then is harvested in December. Climatic characterization of the existing wheat zone indicates that precipitation and minimum temperature during the three consecutive wettest months are the key determinants of potential wheat areas. However, agricultural production patterns vary markedly across Ethiopia according to agro-climatic conditions. As Figure 4 shows, the main wheat growing areas of Ethiopia are the highlands of the northern, central and southeastern parts of the country.

Figure 4: Ethiopia Wheat Production Area, 2002



Source: USDA, 2002

In 2011/12, the largest volumes of wheat were produced in Oromia (57.5 percent) and Amhara (26.4 percent), followed by the Southern Nations, Nationalities, and Peoples Region (SNNPR, 9 percent) and Tigray (6.9 percent). Table 2 summarizes wheat area, production and yields in the four main wheat-growing regions in 2011/2012 (CSA, 2012).

Table 2: Wheat Area, Production and Yield by Regions and Zones, Ethiopia, 2011/12

	Number of holders	Area(ha)	Production (tonne)	Yield (tonne/ha)	Share of total production (percent)
Ethiopia(from 4 regions)	**4,324,679**	**1,437,484.73**	**2,916,333.69**	**2.03**	
Oromia	**1,698,353**	**740,810.94**	**1,675,933.97**	**2.26**	**57.5**
Arsi	299,811	192,152.92	494,274.37	2.57	29.5
West Arsi	144,169	108,258.71	298,407.31	2.76	17.8
Bale	154,727	124,085.02	274,738.24	2.21	16.4
East Shewa	120,104	55,665.56	134,023.26	2.41	8.0
South West Shewa	152,107	57,264.33	121,653.96	2.12	7.3
West Shewa	162,332	46,003.42	100,014.33	2.17	6.0
Amhara	**1,556,788**	**460,164.57**	**769,486.73**	**1.67**	**26.4**
East Gojam	315,213	93,554.80	167,753.90	1.79	21.8
North Shewa	172,542	62,685.68	95,320.13	1.52	12.4
West Gojam	150,803	36,565.57	55,873.17	1.53	7.3
S.N.N.P.R	**647,874**	**125,303.57**	**258,140.29**	**2.06**	**8.9**
Hadiya (Hoesana)	150,948	36,339.73	82,085.37	2.26	31.8
Kembata Tembaro	65,157	12,360.77	25,790.31	2.09	10.0
Keffa	47,030	9,486.53	13,777.96	1.45	5.3
Tigray	**634,352**	**105,308.56**	**200,169.58**	**1.90**	**6.9**
South Tigray	147,404	51,449.20	102,312.56	1.99	51.1
East Tigray	127,999	28,602.21	50,788.37	1.78	25.4
Central Tigray	122,432	25,004.91	46,734.43	1.87	23.3

Source: Author's calculation based on CSA 2011/2012 data, 2014

A major threat facing wheat production is an airborne fungus commonly known as 'rust.' To overcome this problem, research institutes are conducting intensive research and developing rust resistant varieties, but due to insufficient seed multiplication facilities, farmers still use low quality seeds. Although wheat is a major crop in Ethiopia, less than 8 percent of farmers are using improved disease resistant seed varieties (USDA, 2013).

CONSUMPTION/UTILIZATION

In Ethiopia, wheat grain is used in the preparation of a range of products: *injera* (traditional staple pancake), *dabo* (bread), *tella* (local beer) and several other local food items (e.g., *dabokolo*, *ganfo* (porridge), *kinche*, *nifro* and *kolo*). Furthermore, wheat straw is commonly used as a roof thatching material, and as a feed for animals. In 2004/05, wheat contributed an average of 200 kcal/day to the calorie intake in urban areas and about 310 kcal in rural areas (Table 3), accounting for about 12.6 percent of the national calorie intake in 2004/05. Recently, the share of wheat in cereal consumption has increased to 20 percent, making wheat the second most important cereal consumed in Ethiopia (MAFAP, 2013).

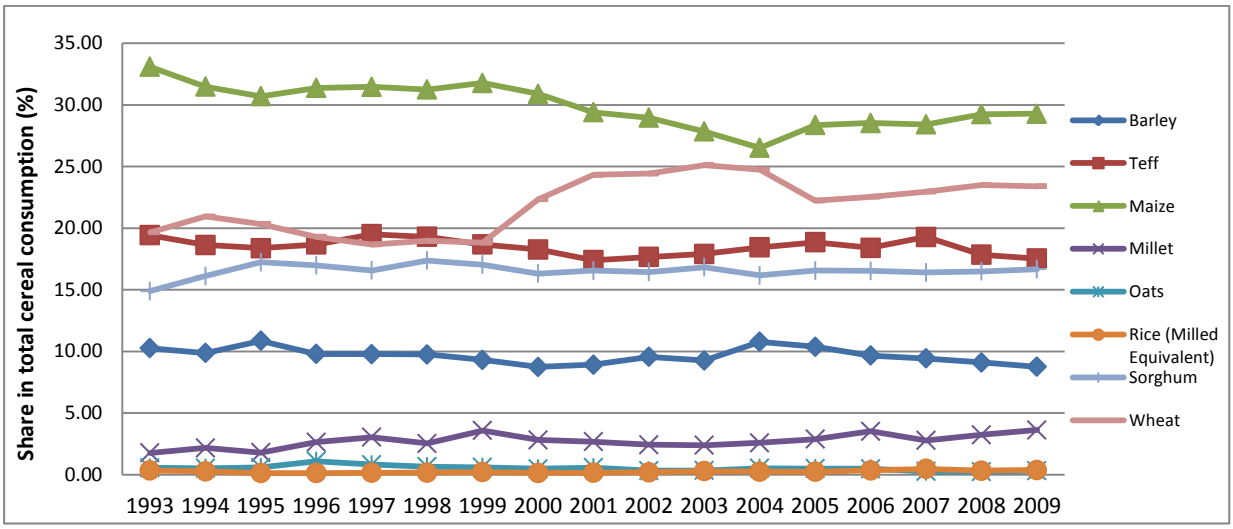
Table 3: Rural vs. Urban Per Capita Calorie Consumption of Food Items, Ethiopia, 2004/05

	Per capita calories			
Food item	Urban	Rural	National	percent of national
Cereals				
Teff	601.70	196.69	254.13	10.91
Wheat	200.59	309.79	294.30	12.63
Barley	38.16	144.58	129.48	5.56
Maize	107.53	435.99	389.40	16.71
Sorghum	94.72	366.21	327.70	14.06
Other- cereals	25.21	53.29	49.31	2.12
Processed-cereals	195.15	17.10	42.35	1.82
Enset/kocho/bulla	27.18	215.15	188.49	8.09
Total cereals & enset	**1290.24**	**1738.79**	**1675.17**	**71.90**
Non-cereals				
Pulses	**123.94**	**167.06**	**160.95**	**6.91**
Oil-seeds	2.49	5.43	5.01	0.22
Animal-products	65.43	58.07	59.12	2.54
Vegetables & fruits	60.78	59.43	59.62	2.56
Coffee/tea/chat	30.62	42.72	41.01	1.76
Root-crops	72.36	124.52	117.12	5.03
Sugar & salt	93.54	51.67	57.61	2.47
Total (National)	**1987.96**	**2386.46**	**2329.94**	**100.00**

Source: Guush Berhane, et al., 2011, Food grain Consumption and Calorie Intake Patterns in Ethiopia, ESSP II Working Paper 23, IFPRI/EDRI, 2014

The share of wheat in total cereal consumption has increased from about 20 percent in 1993-2000 to nearly 24 percent in 2001-2009 (Figure 5). This shift is likely due to the growing consumption of bread in urban areas and food aid (mainly in the form of wheat) in vulnerable rural areas. Importantly, there is an overall shift from the consumption of teff to wheat because of price rise, i.e. substitution effect from teff (USDA, 2013). Recently, the wheat consumption trend is increasing (Figure 5) in urban areas due to population growth (annual rate of about 2.6 percent), migration to urban areas and changes in life styles, e.g., from eating teff (*injera)* to bread, etc.

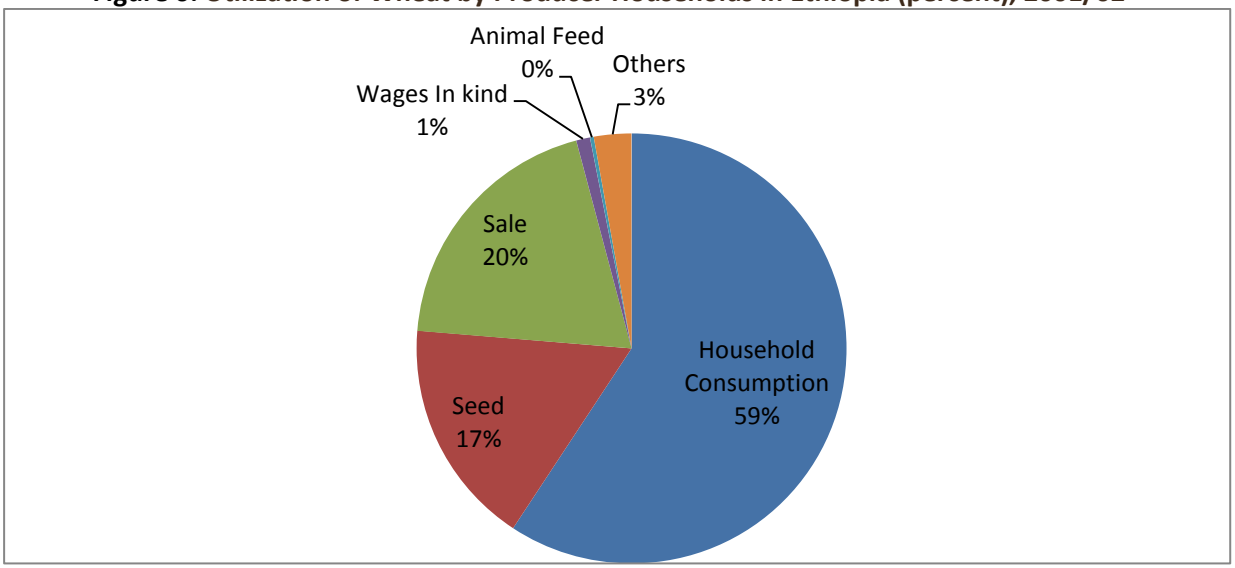
Figure 5: Trends in the Share (percent) of Major Staples in the Total Cereal Consumption in Ethiopia, 1993-2009



Source: Author's elaboration based on FAOSTAT data, 2014

The dominant wheat producers are smallholder subsistence farmers who consume a good portion of what they produce, according to 2001/02 CSA data (See Figure 6). From what is produced annually, households, on average, consume about 59 percent, sell about 19.5 percent, retain about 17 percent for seed, and use the remainder as in-kind payments for labour, animal feed and other purposes (ECXA, 2008).

Figure 6: Utilization of Wheat by Producer Households in Ethiopia (percent), 2001/02



Source: Elaborated from Ethiopian Commodity Exchange/ECX Study based on 2001/02 CSA data, 2014

Regionally speaking, per capita consumption is higher in the south-central highlands than in the northern highlands (Jeni Klugman and Josef Loening, 2007), cited in Tadesse (2012). Harari households consume most of what is produced (85percent), followed by Afar (77percent), Somale (70percent), Tigray (69percent), Amhara (65percent), Benishangul–Gumz (61percent), Oromia (57percent), SNNPR (57percent) and Addis Ababa (51percent). The national average of marketed wheat is 20 percent but the largest proportion used for sale is in Oromia and SNNPR (22 percent) (ECXA, 2008).

MARKETING AND TRADE

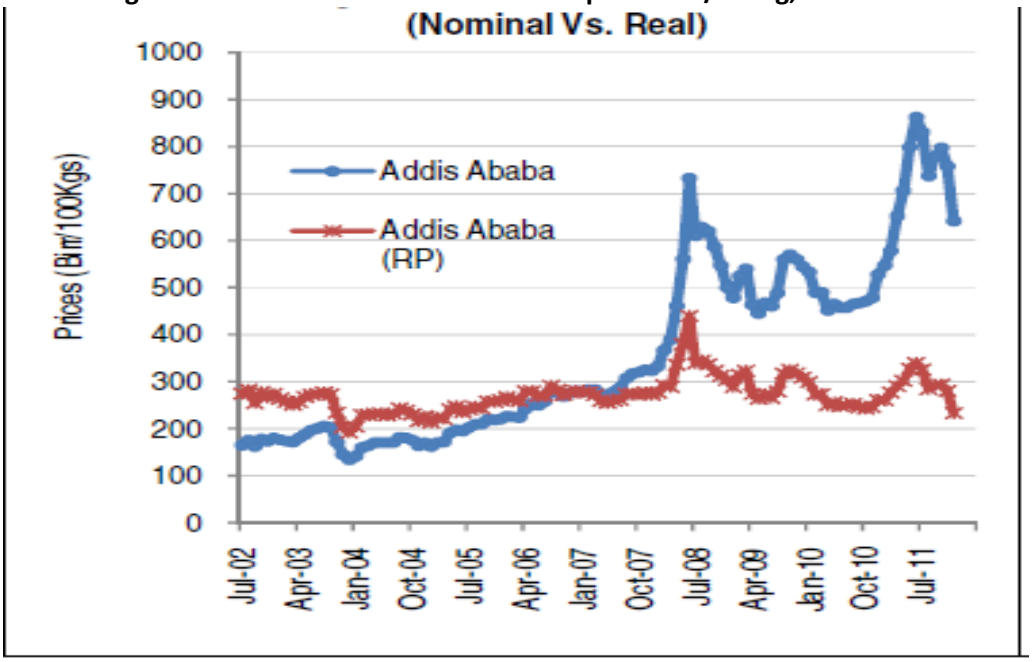
Despite the grain market liberalization policy in 1991, Ethiopian grain markets remain poorly integrated and are characterized by significant price volatility (Negassa and Jayne, 1997). Only 28 percent of total cereal production reaches the market, suggesting considerable scope for expanding the volume of the grain market.[2]

Monthly retail prices of wheat for the period 2005 to 2011 show a steadily increasing trend until the beginning of 2008, when prices reached their maximum levels (Figure 7). While the real prices of wheat show a moderate increase, nominal prices rose gradually over the period 2005-2007, before more than doubling in mid-2008. Since then, though wheat prices declined by almost a quarter, they were still far above pre-2007 levels, leaving a tremendous gap between the nominal and real price. The real price of wheat in mid-2009 was only 7 percent higher than mid-2007. Real and nominal prices have also fluctuated since 2007, rising sharply in 2008, falling significantly in 2009, and again increasing sharply in 2011 by about 20 percent, even beyond the highest price level in 2008 (Figure

[2]Gabre-Madhin, Eleni Z. 2001.

7). Prices were extremely volatile from 2010 to 2012, according to the EGTE price database. The fluctuation of the nominal price gives unstable price and market signals to the actors in the value chain. The figure shows that the real price does not change much, but due to the general inflation, the nominal price fluctuates more than that of the real price (Figure 7).

Figure 7: Price Trends of Wheat in Ethiopia in Birr/100kg, 2005-2011



Source: Tadesse (2012) ASARECA project (preliminary draft report), EDRI, 2014

On average, wheat production was about 1.6 million tonnes in the period 2000-2005, compared to the local demand of about 2.2 million tonnes, thus creating an annual deficit of roughly 0.7 million tonnes. The wheat import level is significant but it is largely made up of food aid rather than competitive import. In the period 2000-2006, much of the food deficit was covered through food aid, accounting for about 85 percent of total wheat imports (FAOSTAT, 2011). Nevertheless, the country, on average, has imported (commercially) more than 1 million metric tonnes of wheat per year, with an average of 1.07 million metric tonnes from 2008-2012 (
Table **4**). The country exported a negligible quantity of a maximum of only 7,087 tonnes (
Figure **8**) throughout the period (
Table **4**).

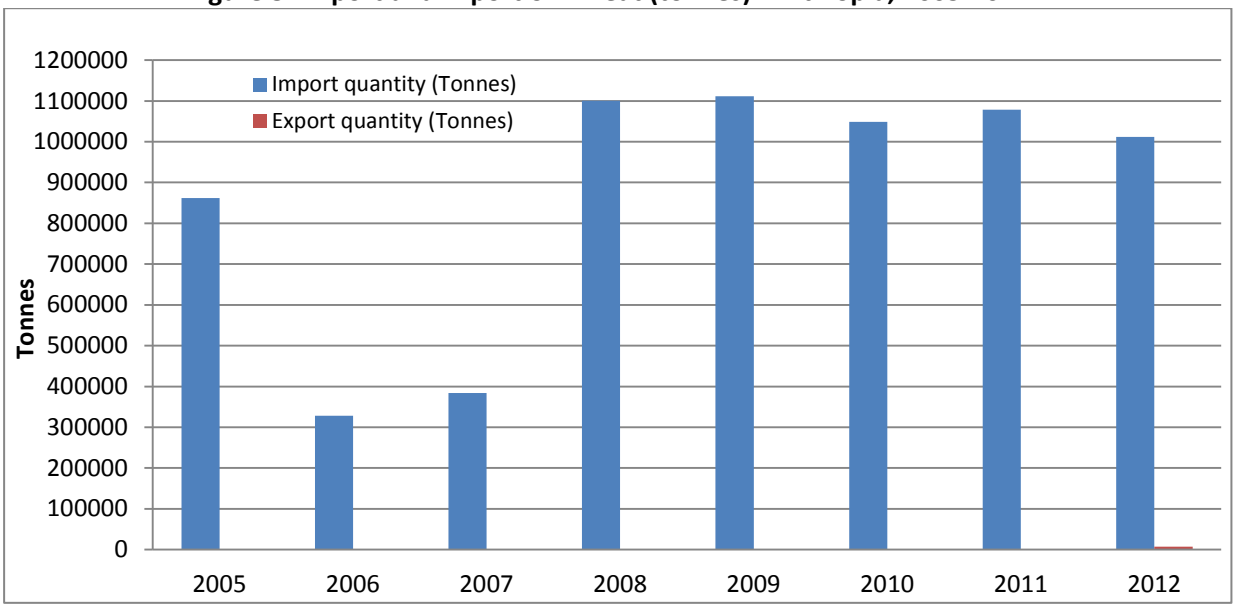
Table 4: Wheat Trade in Ethiopia, 2005-2012

Item	2005	2006	2007	2008	2009	2010	2011	2012
Import quantity (tonnes)	862145	328306	384127	1100050	1111522	1048706	1078302	1011388
Export quantity (tonnes)	195	-	1	359	1	5	1000	7,087
Net Trade (tonnes)	-861950	-	-384126	-1099691	-1111521	-1048701	-1077302	-1004301
Import value (1000USD)	224796	83786	134034	465194	321619	304281	402631	332967
Export value (1000USD)	29		1	124	1	5	240	36479
Net trade (1000USD)	-224,767		-134033	-465070	-321618	-304276	-402391	-296488
Implicit Value exports, USD/T	150	-	583	347	2945	962	240	5,147

Implicit Value Imports, USD/T	261	255	349	423	289	290	373	329

Source: elaboration from UN Comtrade data, 2014

Figure 8: Import and Export of Wheat (tonnes) in Ethiopia, 2005-2012

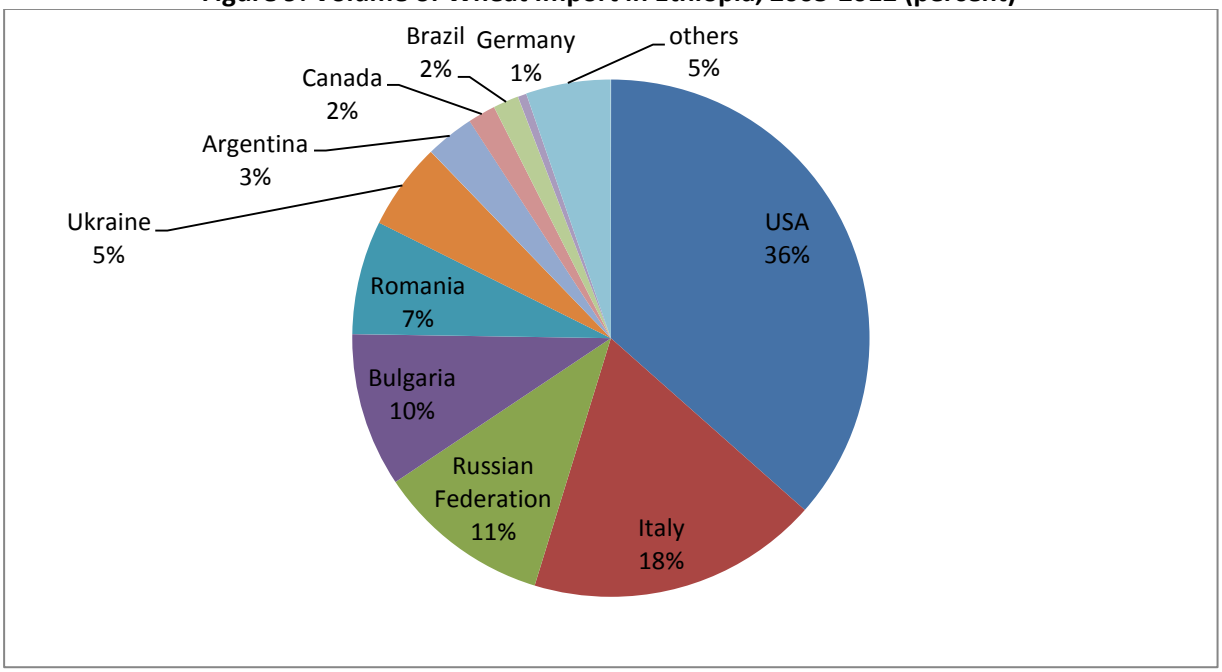


Source: elaboration from UN Comtrade data, 2014

After 2007, the United States' share in total wheat imports to Ethiopia declined from 61 percent during the 2005-2007 period to 26.4 percent during the 2008-2012 period. However, the United States was still the dominant partner for total imports from 2005-2012, holding a 36 percent share (Figure 9). It was only in 2012 that imports from Argentina (20.8percent), USA (20.2percent), Italy (17.5percent) and India (15.9percent) took a large part of Ethiopia's share of wheat imports (Figure 9).

Since 2011, Ethiopia has been exporting more significant amounts of wheat, primarily to neighbouring countries, such as Somalia (100percent in 2011) and Sudan (99.2percent in 2012), with negligible exports to the Netherlands (0.7percent in 2012) and USA (0.002percent in 2012). UN Comtrade data shows that Ethiopia exported 1,000 and 7,087 tonnes of wheat in 2011 and 2012, respectively, from an average of only 112.2 tonnes over the 2005-2010 period.

Figure 9: Volume of Wheat Import in Ethiopia, 2005-2012 (percent)



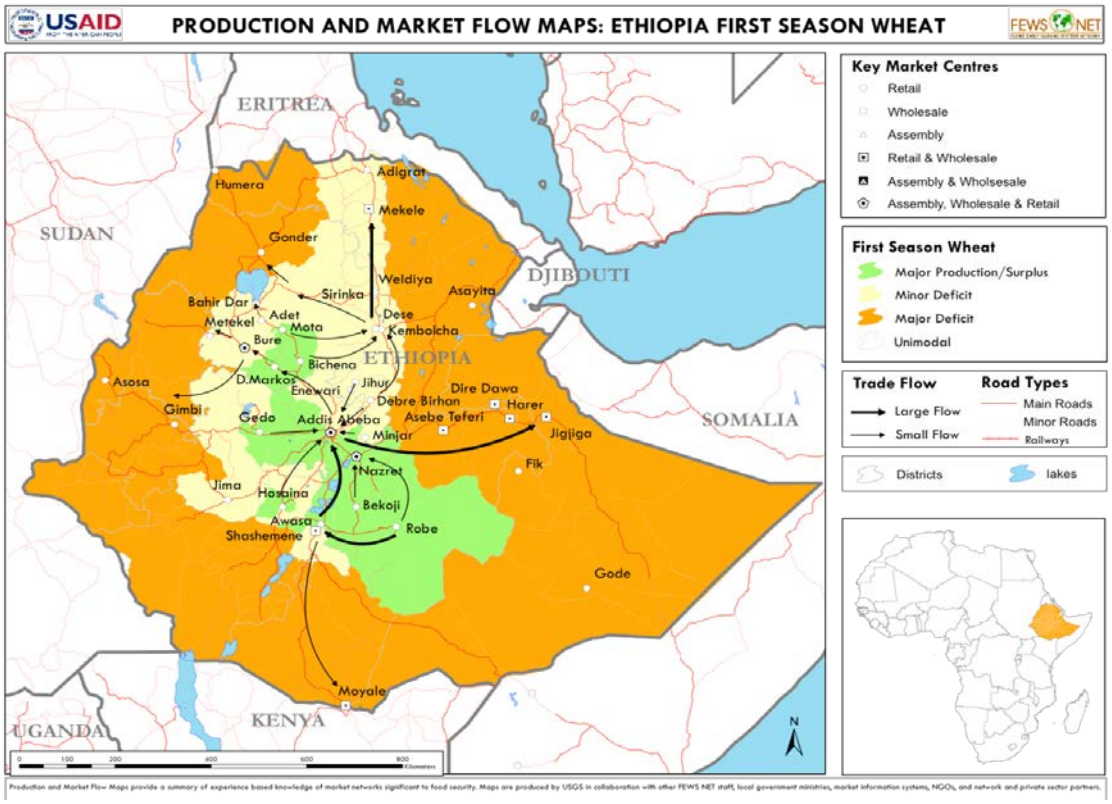
Source: Author's elaboration based on UN Comtrade

DESCRIPTION OF THE VALUE CHAIN

The grain marketing chain in Ethiopia is relatively short, primarily due to the low level of commercial grain processing and a lack of specialization from grain wholesalers, who are often engaged in retail and other types of trade (Walker and Wandschneider, 2005). This is also true for wheat in Ethiopia.

In Ethiopia, the major surplus areas of wheat are the zones in Oromia and SNNPR, namely Bale, East Arsi, West Arsi, Western and Eastern Shoa, Central SNNPR (Hadiya and Kembata) and Central and Southern Amhara (East Gojam, North Shoa) (see Figure 10). Trade flows from these surplus areas in all directions to Addis Ababa (most importantly through Shashemene). Other major flows are from North Western areas to Dessie and then to Mekele, and from Addis Ababa to other deficit areas, including Dire Dawa, Harar, Jijiga and peripheral regions of Oromia, Somale and Benshangul (e.g., Moyale, Asosa). Figure 10 clearly indicates that the major route of wheat trade is from Addis Ababa to East Ethiopia, and from Desie to North Ethiopia (e.g., Mekele), whereas the minor routes are to Western, Southern and North Western peripheries.

Figure 10: Production and Market Flow Maps, Ethiopia First Season Wheat, 2009



Source: FEWSNET, 2013

With no change over the period 2011-12, the trade flow involves rural assemblers and regional wholesalers, retailers, part-time farmer-traders, brokers, agents, assemblers, processors, cooperatives, the Ethiopian Grain Trade Enterprise (EGTE) and consumers (Figure 11). No study estimated the number of dominant players in the value chain, but a study reported that the number of large flourmills in Ethiopia was 210 in 2012, with an annual milling capacity of about 3.7 million tonnes (USDA, 2013). According to this study, these mills obtained imported wheat from the EGTE, which accounts for 30 percent of their wheat demand for more milling, while the remainder was bought from local markets.

The main actors in the value chain are smallholder farmers who tend to sell large quantities of their production during and soon after the *meher* (main) harvest in December, but further sales may occur as they off-load grain stocks to avoid damage and loss caused by storage pests (Walker and Wandschneider 2005). Farmers can either sell the grain to wholesalers, or trade small quantities to rural assemblers.[3]

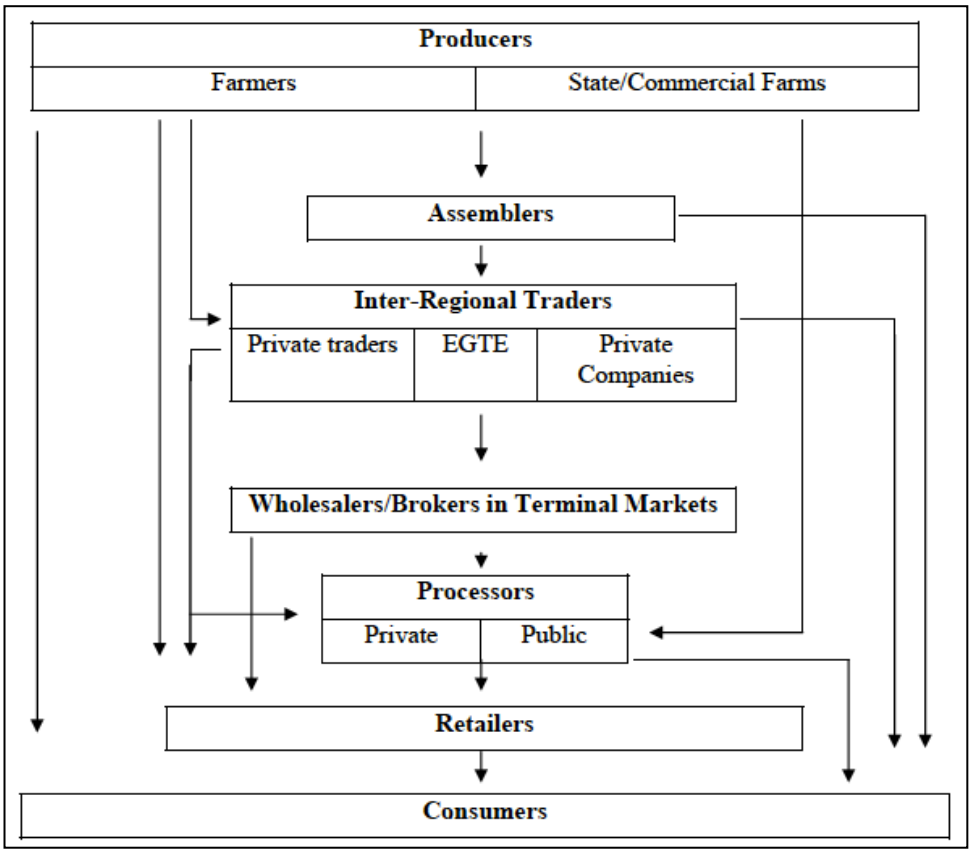
Brokers at the Addis Ababa central market have the task of checking the grain quality, determining the market-clearing price, and then selling it to other traders, mills, government agencies or NGOs. Retailers in regional markets of deficit areas or in urban centers purchase grain in relatively small quantities (less than a tonne) from regional wholesalers. However, the interplay among participants

3. Often larger-scale farmers operate independently and assemble grain from many sources for direct resale to consumers or sometimes, act as agents for wholesalers on a commission basis. See Walker and Wandschneider, 2005.

depends upon whether a particular market is a surplus, deficit or terminal market. In Addis Ababa, the dominant participants are regional wholesalers from surplus and deficit areas, but also brokers, institutional buyers, retailers, consumers and local traders.

By contrast, the main actors in surplus areas are farmers, assemblers, wholesalers, retailers and consumers. In deficit regions, the main participants are wholesalers bringing grain from surplus areas, wholesalers stationed in the market of the deficit area (and who receive supplies for surplus areas), retailers and consumers. This has been the only significant line of trade in recent years (2011-2013).

Figure 11: Grain Value Chain in Ethiopia, 2005



Source: Walker and Wandschneider, 2005.

POLICY DECISIONS AND MEASURES

Following the overthrow of the former military Government and the introduction of policy reforms in 1992, policies and strategies for both growth and poverty reduction have placed a heavy emphasis on cereal production and marketing. Accordingly, the wheat market, along with other cereals, has been liberalized. The wheat market is characterized by small-scale private traders operating along with large-scale public (EGTE) and private companies, which tend to be very active during periods of shortages and local purchase for food aid distributions.

The Ethiopian Commodity Exchange (ECX) was established in 2008 to provide a marketplace where buyers and sells could come together to trade. The objective of the ECX is to ensure the development of an efficient modern trading system and to protect the rights and benefits of the traders along the value chain. The ECX strengthens international trade by providing market information and advice to

actors along the chain. The Exchange operates the exportation of coffee, sesame and mung beans but plans to expand to cereal crops, such as wheat, have not yet been realized.

A key strategy focusing on wheat is the relatively strong wheat research and breeding program based at the Ethiopian Institute of Agricultural Research (EIAR). Although several new varieties have been disseminated to farmers since the inception of wheat research, no real breakthroughs in smallholders' yields have been achieved. In fact, a gap exists between the yield of research demonstration-sites and the actual yield that smallholder farmer achieve on their plots. Among the major technical constraints are lack of disease resistant and high yielding varieties adapted to a range of environments and poor crop management practices. Wheat farmers and breeders are in a constant race against rust diseases, as previously resistant varieties became susceptible to new races of rust.[4] Furthermore, scholars agree that the application of fertilizers below the recommended rate limits the yield enhancement of seed varieties, as expected.

The Agricultural Transformation Agency (ATA) was established in 2010 to enhance productivity and production of smallholder farmers and pastoralists as part of the current five-year (2011-2015) Growth and Transformation Plan (GTP). Focus has been placed on several commodities such as teff, wheat, maize, barley, pulses, oilseeds, rice and livestock (See the Ethiopian Farmers Project/ IPMS website).

In Ethiopia, high food-price volatility was prevalent in 2008, 2011 and 2012. The inflation rate of cereals during 2008, 2011 and 2012 was respectively 99, 34 and 33 percent, whereas the general inflation rate during the three years was 44, 33 and 23 percent, respectively (CSA, 2013). Government policy responses to the price hikes in 2008 and in 2011 have included the import and sale of imported wheat (and edible oil and corn) to the urban poor at subsidized prices, mainly through the parastatal Ethiopian Grain Trade Enterprise (EGTE). Government imports in late 2008 lowered market wheat prices significantly but market prices were still 36 percent higher, on average, than import parity prices. Beginning in April 2008, the government's rationing of foreign exchange inhibited private sector imports, which finally resulted in less imports and higher prices. It is argued that allowing the private sector foreign exchange access to import wheat would have had the same welfare effects, while saving the government US$ 90 million in subsidy rents[5] (Dorosh, et al. 2009).

Beyond implicit private import restriction, the government more explicitly and officially banned grain exports in 2008, and then again in 2011 in order to ensure domestic availability.

Occasionally, once the domestic supply needs were considered met, maize exports were allowed to neighbouring countries (USDA, 2013). The lack of reliable and real time data poses a major threat in these circumstances, since it is solely based on EGTE data that the *sufficiency* of national supply is decided. Additionally, in a response to increasing inflation of wheat and other grains, the government lifted value-added & turnover taxes on imported foodstuffs, etc. (USDA, 2013).

[4] See: http://www.cimmyt.org/en/newsletter/511-2011/1008-resistant-wheats-and-ethiopian-farmers-battle-deadly-fungus

[5] Dorosh, Paul (IFPRI) & Hashim Ahmed (EDRI). 2009. *Foreign Exchange Rationing, Wheat Markets and Food Security in Ethiopia*. Available at http://www.ifpri.org/sites/default/files/publications/essppb04.pdf

The role of food aid and subsidized sale of imported public stock

Despite increases in production, the quantity of imported wheat remains high, with 20 percent comprising of wheat imported from The United States (USDA, 2013). Wheat import data for Ethiopia includes food aid, which averaged more than half a million tonnes in 2008 (Rashid, 2010) and then declined to 300,000 tonnes in 2011/12 (USDA, 2013). However, government wheat imports (through EGTE) have also increased significantly in response to the 2008 food price crisis. Wheat imported by the government is sold to poor consumers in urban areas at subsidized prices.

In 2008, the EGTE and WFP imported 520 and 515 thousand tonnes of wheat and maize, respectively (Rashid 2010). Undoubtedly, one of the major drawbacks of food aid to rural markets is that it may depress market prices. This is because the amount of grain that recipient households may have otherwise purchased in the market is reduced (thus reducing demand), and the potential sales of food aid onto markets (thus increasing supplies). Subsidized sale of imported staples, therefore, has a direct impact on producers by lowering market prices.

Several authors have highlighted that large quantities of food aid, if poorly targeted, depress market prices and reduce the incentive to produce (Jayne and Molla 1995; Molla et al.1997; USDA, 2013). A comprehensive empirical analysis of the link between food aid shipments and food prices in Ethiopia over the period 1996-2006 confirmed the existence of substantial food aid effects on local food prices in Ethiopia. The study showed that, on average, a 1 percent increase in annual per capita food aid reduced the monthly price by as much as 5 percent and the impact was slightly stronger for a market in major surplus producing areas (Markos) (Tadesse and Shively, 2009).[6] Combined with the sale of imported public stock at subsidized prices, the impact of disincentives on producers could be substantial. The problem is particularly serious when food is poorly targeted or when food aid distribution is not related to local production situations.[7] However, Bezu and Holden (2008) have shown the correlation between increased fertilizer use and food for work programmes in one of the most vulnerable areas of Ethiopia (Tigray). Due to relieved liquidity constraints, farmers were encouraged to purchase fertilizer.

Exchange rate policies

The exchange rate in Ethiopia is characterized by managed floating with strong Government control. The National Bank of Ethiopia is the sole provider of foreign exchange and only authorized banks and investors who are able to bid for at least USD 0.5 million are allowed to participate in the weekly foreign exchange auction. The marginal rate of each auction (once a week) serves as the official rate until a new rate is established in the next round (a week later). It is believed that the domestic currency (Ethiopian currency Birr/ETB) was overvalued, especially in 2008, 2009 and 2010. The extent of overvaluation was estimated at 40 percent during this period and the Government was forced to devalue the currency by 25 percent in September 2010 (Rashid, 2010).[8] As a result, ETB depreciated

[6]Tadesse, G. and G. Shively (2009), Food Aid, Food Prices, and Producer Disincentives in Ethiopia, American Journal of Agricultural Economics, 91 (4), November 942-955.

[7]For instance, Nunn and Qian (2011) found that the amount of food aid shipments to Africa is correlated with the level of surpluses in the donor countries (e.g. US and EU). Nunn, Nathan and Nancy Qian (2011) "Aiding Conflict: The Unintended Consequences of U.S. Food Aid on Civil War," Working Paper, Duke University

[8]Rashid S. (2010). Staple food prices in Ethiopia, prepared for the COMESA policy seminar on "Variation in staple food prices: Causes, consequence, and policy options", Maputo, Mozambique, 25-26 January 2010.

by about 30 percent between 2010 and 2011. Another study (Dorosh, et al., 2009)[9] showed that the real exchange rate appreciated by 9.7 in July 2005, 12.8 in July 2006, 14.9 in July 2007, 33.8 in July 2008 and 26.3 percent in June 2009. The high rate of inflation (relative to the low inflation among trading partners) and increasing pressure on foreign exchange reserves are among the major causes of currency appreciation in Ethiopia.

Between 2005 and 2008, inflation rates hit double digits and then declined to 8.5 and 7 percent in 2009 and 2010, respectively. In 2011, another high inflation rate of 33.2 percent was recorded, followed by a lower but still very high rate of 24.1 percent in 2012 (CSA data). In 2007 and 2008, the foreign currency reserve fell short of the critical requirement of 12 weeks' worth of imports, forcing the government to begin foreign exchange rationing (Rashid, 2010). In March 2008, access to the foreign exchange for imports was restricted (rationed) to curb the excessive drawdown of reserves. As a result, there have been no private sector grain imports of wheat since April 2008 (except minor shipments in 2009 and 2010) and all grain imports came through the state-owned EGTE.

[9]Dorosh P, S. Robinson and H. Ahmed (2009), Economic Implications of Foreign Exchange Rationing in Ethiopia, IFPRI/EDRI ESSP2 Discussion Paper 009.

3. METHODOLOGY

MAFAP methodology seeks to measure price incentives for producers and other marketing agents in key agricultural value chains. The analysis is based on the comparison between observed domestic prices and constructed reference prices. Reference prices are calculated from the international price of the product at the country's border, where the product enters the country (if imported) or exits the country (if exported). This price is considered the benchmark price, free of influence from domestic policies and markets. MAFAP estimates two types of reference prices – observed and adjusted. *Observed reference prices* are those that producers and other marketing agents could receive if the effects of distortions from domestic market and trade policies, as well as overall market performance, were removed. *Adjusted reference prices* are the same as observed reference prices, but also exclude the effects of any additional distortions from domestic exchange rate policies, structural inefficiencies in the commodity's value chain, and imperfect functioning and non-competitive pricing in international markets.

MAFAP's price incentives analysis is based on the law of one price, which is the economic theory that there is only one prevailing price for each product in a perfectly competitive market. This law only applies in the case of homogeneous goods, if information is correct and free, and if transaction costs are zero. Thus, this analysis was conducted for goods that are either perfectly homogeneous or perfect substitutes in the local market in terms of quality, or, failing that, are simply comparable goods. Indicators calculated from reference and domestic prices will, therefore, reveal whether domestic prices represent support (incentives) or a tax (disincentives) to various agents in the value chain.

Domestic prices are compared to reference prices at two specific locations along commodity value chains – the farm gate (usually the main production area for the product) and the point of competition (usually the main wholesale market where the domestic product competes with the internationally traded product). The approach for comparing prices at each location is summarized below, using an imported commodity as an example. In this situation, the country is importing a commodity that arrives in the port at the benchmark price (usually the unit value CIF price at the port of entry). In the domestic market, we observe the price of the same commodity at the point of competition, which is in this case the wholesale market, and at the farm gate. We also have information on observed access costs, which are all the costs associated with bringing the commodity to market, such as costs for processing, storage, handling, transport and the different margins applied by marketing agents in the value chain. These include access costs between the border and wholesale, as well as between the farm gate and wholesale.

The benchmark price is made comparable to the domestic price at wholesale by adding the access costs between the border and wholesale, resulting in the observed reference price at wholesale. This takes into account all the costs incurred by importers and other agents to bring the commodity to market, which in effect, raises the price of the commodity. The reference price at wholesale is further made comparable to the domestic price at the farm gate by deducting the access costs between the farm gate and wholesale, resulting in the observed reference price at farm gate. This takes into account all the costs incurred by farmers and other agents to bring the commodity from the farm to the wholesale market. Mathematically, the equations for calculating the observed

reference prices at wholesale (RP_{owh}) and farm gate $\left(RP_{ofg}\right)$ for an imported commodity are as follows:

$$RP_{owh} = P_b + AC_{owh}$$

$$RP_{ofg} = RP_{owh} - AC_{ofg}$$

where AC_{owh} are the observed access costs from the border to wholesale, including handling costs at the border, transport costs from the border to the wholesale market, profit margins and all observed taxes and levies, except tariffs, and P_b is the benchmark price. AC_{ofg} are the observed access costs from the farm gate to wholesale, including handling costs at the farm, transport costs from farm to wholesale market, processing, profit margins and all observed taxes and levies.

The same steps described above can be taken a second time using benchmark prices and access costs that have been adjusted to eliminate market distortions due to exchange rate misalignments, structural inefficiencies in the commodity's value chain[10] and imperfect functioning and non-competitive pricing in international markets, where possible and relevant. The adjusted benchmark prices and access costs are then used to generate a second set of *adjusted* reference prices, in addition to the first set of *observed* reference prices calculated.

For exported commodities, a slightly different approach is used. In this case, the border is generally considered the point of competition (wholesale), and the unit value FOB price for the commodity is normally taken as the benchmark price. Furthermore, observed and adjusted reference prices at wholesale are obtained by subtracting, rather than adding, the access costs between the border and wholesale. Mathematically, the equations for calculating the observed reference prices at wholesale(RP_{owh}) and farm gate $\left(RP_{ofg}\right)$for an exported commodity are as follows:

$$RP_{owh} = P_b - AC_{owh}$$

$$RP_{ofg} = RP_{owh} - AC_{ofg}$$

After observed and adjusted reference prices are calculated for the commodity, they are subtracted from the domestic prices at each point in the value chain to obtain the observed and adjusted price gaps at wholesale and farm gate. *Observed price gaps* capture the effect of distortions from trade and market policies directly influencing the price of the commodity in domestic markets (e.g. price ceilings and tariffs), as well as overall market performance. *Adjusted price gaps* capture the same as the observed, in addition to the effect of any distortions from domestic exchange rate policies, structural inefficiencies in the commodity's value chain, and imperfect functioning and non-competitive pricing in international markets. Mathematically, the equations for calculating the observed price gaps at wholesale(PG_{owh}) and farm gate $\left(PG_{ofg}\right)$are as follows:

$$PG_{owh} = P_{wh} - RP_{owh}$$

$$PG_{ofg} = P_{fg} - RP_{ofg}$$

[10] Structural inefficiencies in commodity value chains may include government taxes and fees (excluding fees for services), high transportation and processing costs, high profit margins captured by various marketing agents, bribes and other non-tariff barriers.

where P_{fg} is the domestic price at farm gate, RP_{ofg} is the observed reference price at farm gate, P_{wh} is the domestic price at wholesale, and RP_{owh} is the observed reference price at wholesale.

A positive price gap, resulting when the domestic price exceeds the reference price, means that the policy environment and market functioning as a whole generate incentives (support) to producers or wholesalers. For an imported commodity this could be due to distortions such as the existence of an import tariff. On the other hand, if the reference price exceeds the domestic price, resulting in a negative price gap, this means that the policy environment and market functioning as a whole generate disincentives (taxes) to producers or wholesalers. For an imported commodity this could be due to distortions such as a price ceiling established by the government to keep domestic prices low.

In general, price gaps provide an absolute measure of the market price incentives (or disincentives) that producers and wholesalers face. Therefore, price gaps at wholesale and farm gate are divided by their corresponding reference price and expressed as a ratio, referred to as the ***Nominal Rate of Protection (NRP)***, which can be compared between years, commodities, and countries.

The *Observed Nominal Rates of Protection* at the farm gate (NRP_{ofg}) and wholesale (NRP_{owh}) are defined by the following equations:

$$NRP_{ofg} = \frac{PG_{ofg}}{RP_{ofg}} \; ; \; NRP_{owh} = \frac{PG_{owh}}{RP_{owh}}$$

Where $PG_{ofg}$is the observed price gap at farm gate, RP_{ofg} is the observed reference price at the farm gate,$PG_{owh}$is the observed price gap at wholesale and RP_{owh} is the observed reference price at wholesale.

Similarly, the *Adjusted Nominal Rates of Protection* at the farm gate (NRP_{afg}) and wholesale (NRP_{awh}) are defined by the following equations:

$$NRP_{afg} = \frac{PG_{afg}}{RP_{afg}} \; ; \; NRP_{awh} = \frac{PG_{awh}}{RP_{awh}}$$

where $PG_{afg}$is the adjusted price gap at farm gate, RP_{afg} is the adjusted reference price at the farm gate,$PG_{awh}$is the adjusted price gap at wholesale and RP_{awh} is the adjusted reference price at wholesale.

If public expenditure allocated to the commodity is added to the price gap at farm gate when calculating the ratios, the ***Nominal Rate of Assistance (NRA)*** is generated. This indicator summarizes the incentives (or disincentives) due to policies, market performance and public expenditure.[11] Mathematically, the Nominal Rate of Assistance is defined by the following equation:

$$NRA = \frac{PG_{afg} + PE_{csp}}{RF_{afg}}$$

[11] The NRA indicator was not calculated for any of the commodities analyzed because of insufficient data on public expenditure. However, it will be developed in the forthcoming reports, as the public expenditure analysis is improved and better data are made available.

where PE_{csp} is commodity-specific public expenditure that has been identified and measured as monetary units per tonne.

Finally, MAFAP methodology estimates the ***Market Development Gap (MDG),*** which is the portion of the price gap that can be attributed to "excessive" or inefficient access costs within a given value chain, exchange rate misalignments, and imperfect functioning of international markets. "Excessive" access costs may result from factors such as poor infrastructure, high processing costs due to obsolete technology, government taxes and fees (excluding fees for services), high profit margins captured by various marketing agents, bribes and other non-tariff barriers. Therefore, the total MDG at farm gate is comprised of three components – gaps due to "excessive" access costs, the exchange rate policy gap and the international market gap. When added together, these components are equivalent to the difference between the observed and adjusted price gaps at farm gate.

Similar to the price gaps calculated, the MDG is an absolute measure, which is also expressed as a ratio to allow for comparison between years, commodities, and countries. This relative indicator of the total MDG affecting farmers is derived by calculating the ratio between the total MDG at farm gate and the adjusted reference price at farm gate as follows:

$$MDG_{fg} = \frac{(ACG_{wh}+ACG_{fg}+EXPG+IMG)}{RP_{afg}}$$

where ACG_{wh} is the access cost gap at wholesale defined as the difference between observed and adjusted access costs at wholesale, ACG_{fg} is the access cost gap at farm gate defined as the difference between observed and adjusted access costs at the farm gate, ERPG is the exchange rate policy gap, and IMG is the international market gap.

A more detailed description of the methodology applied in this analysis is available on MAFAP's website at www.fao.org/in-action/mafap.

4. DATA REQUIREMENTS AND CALCULATION OF INDICATORS

To calculate MAFAP's price incentives indicators, several types of data are needed. This section presents the data that was obtained and methodological decisions that were taken in this analysis.

TRADE STATUS OF THE PRODUCT

Though Ethiopia used to be a net exporter of wheat (Gorfu et all., 1996), low and declining levels of production and productivity have transformed the country into a net importer. With almost insignificant exports and thus a negative trade balance, Ethiopia was a net importer of wheat for the entire 2005-2012 review period (Table 5). The rapidly increasing population, in conjunction with changing consumption patterns, prevented domestic production from meeting the growing demand for wheat. As a result, the level of wheat self-sufficiency in Ethiopia was estimated at only 55 percent (Demeke, 2012), which has led the country to import large quantities of the cereal over the period analysed.

Table 5: Wheat Trade in Ethiopia, in Volume (tonnes) and Value (1,000 USD), 2005-2012

Item	Unit	2005	2006	2007	2008	2009	2010	2011	2012
Import volume	Tonnes	862145	328306	384127	1100050	1111522	1048706	1078302	1011388
Export volume	Tonnes	195	-	1	359	1	5	1000	7087
Net Trade		**-861950**	**-328306**	**-384126**	**-1099691**	**-1111521**	**-1048701**	**-1077302**	**-1004301**
Import value	1000 USD	224796	83786	134034	465194	321619	304281	402631	332967
Export value	1000 USD	29	0	1	124	1	5	240	36479
Net trade		**-224767**	**-83786**	**-134033**	**-465070**	**-321618**	**-304276**	**-402391**	**-296488**

Source: Authors, from UN Comtrade data, 2014

MARKET PATHWAY ANALYSED

The type of wheat analysed is white wheat, also known as bread wheat, which is becoming more common than mixed wheat in terms of production and trade in Ethiopia (EGTE, 2013). Bread wheat currently accounts for 60 percent of total wheat production in the country (CIMMYT, 2014).

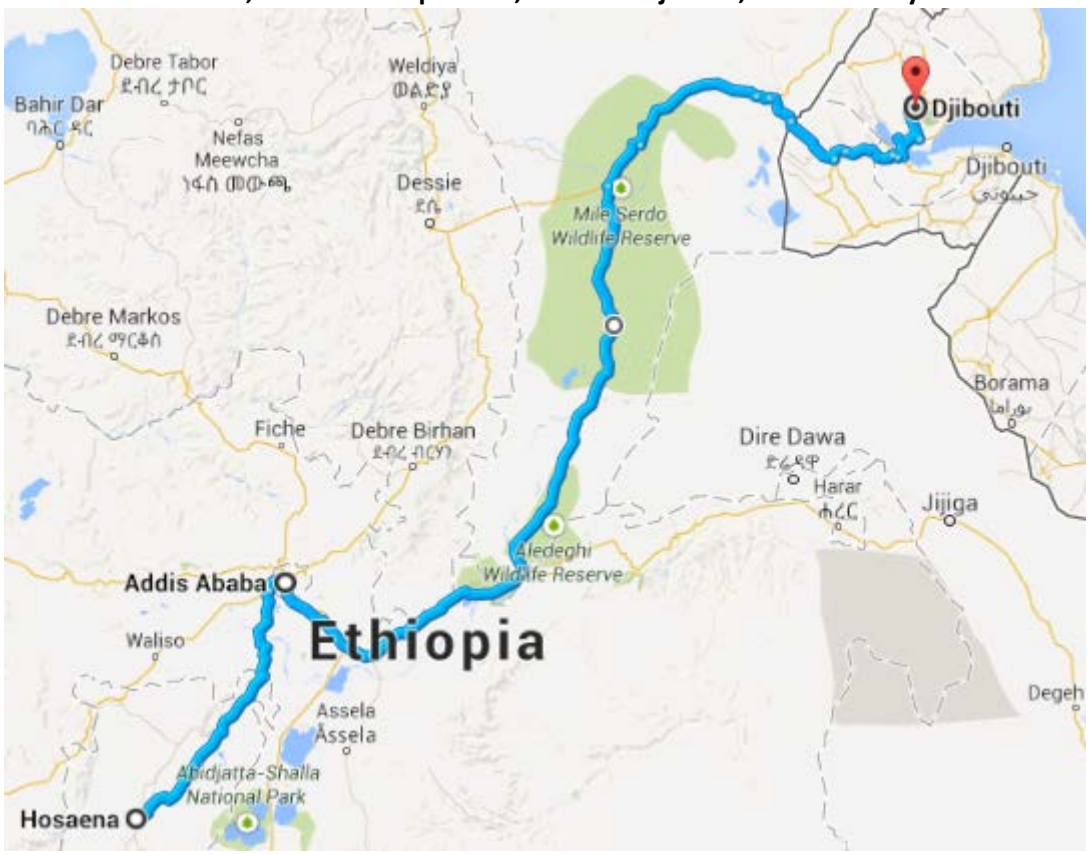
The regions of Oromia, Amhara and SNNPR are the major wheat surplus areas in Ethiopia, and account for 55, 29 and 9 percent of the total volume of wheat production, respectively (see PRODUCTION section). The town of Hosaena, located in the Hadiya zone of the SNNPR region, was chosen as the farm gate for our analysis. Situated 231 km from Addis Ababa, the Hidaya zone accounts for 31 percent of wheat production in the SNNPR region. Furthermore, it is advantageous to analyze the wheat traded from Hosaena because it is transported directly to the Addis Ababa market. Along other routes, wheat goes to Addis Ababa through smaller market towns, which is the case for the Robe-Shashemene-Addis Ababa route and the Arsi-Adama-Addis Ababa route. Additonally, there is a satisfactory amount of information available (e.g., farm gate price from EGTE) on prices and access costs in Hosaena.

Both imported wheat and wheat produced in Hadiya often reach the major market centers in Addis Ababa (see MARKETING AND TRADE for more details on trading routes for wheat in Ethiopia). There is good infrastructure for wheat trade and processing in Addis Ababa, from mills to storage facilities. Also, most of the country's large wheat traders do business there, as Addis Ababa is the headquarters for all wheat stakeholder institutions (importer and exporter associations, notably).

Furthermore, Addis Ababa is an important pole of consumption, with more than 3 million inhabitants, and is therefore considered as the point of competition between locally produced and imported wheat.

When imported, the port of Djibouti is the main entry point for wheat in Ethiopia and was considered as such in the analysis. Djibouti is the privileged port of trade for Ethiopia due to the small distance between Addis Ababa and Djibouti, efficient services when compared to other ports in neighboring countries, and the historical connection of Ethiopia with Djibouti.

Figure 12: Market Pathway Analysed for Wheat in Ethiopia: Hosaena, Production Area, Addis Ababa, Point of Competition, and Port Djibouti, Point of Entry



Source: Authors, from Google maps, 2014

BENCHMARK PRICES

Observed

The basis for calculating a reference price to determine whether wheat producers receive market incentives or disincentives is to establish a benchmark price, which represents the price for wheat that is free of domestic policy and market distortions. Since Ethiopia was a net importer of wheat during 2005-2012, the benchmark price considered is the CIF price for Spelt, common wheat and meslin wheat (HS Code 100190). This denomination includes bread wheat/white wheat, which is the main type of wheat produced and imported in Ethiopia.

The CIF benchmark price has been computed as the ratio of the value and volume of wheat (HS Code 100190) imported in the country, taken from the Ethiopian Revenue and Customs Authority (ERCA) data.

The data from ERCA was preferred over data from UN Comtrade, since ERCA's data specifically refers to bread wheat/white wheat, which is consistently analyzed in this study. It is also believed to account for wheat imports used for food aid to a lesser extent than the data from UN Comtrade. Furthermore, ERCA's figures are considered to better integrate price-influencing factors, such as wheat quality and price negotiation, than the average CIF of the world from UN Comtrade (Table 6).

Table 6: Average Annual CIF Import Prices for Wheat in Ethiopia. USD/tonne, comparison, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012
Wheat CIF (ERCA)	266	265	405	448	326	320	371	294
Wheat CIF (UN Comtrade)	261	255	349	423	289	288	373	329
Wheat USA CIF (UN Comtrade)	263	302	416	557	406	342	440	430
Wheat World CIF (UN Comtrade)	261	255	349	423	289	290	373	374

Source: Author's elaboration based on ERCA, and UN Comtrade data, 2014.

Adjusted

No adjustments to benchmark prices were made.

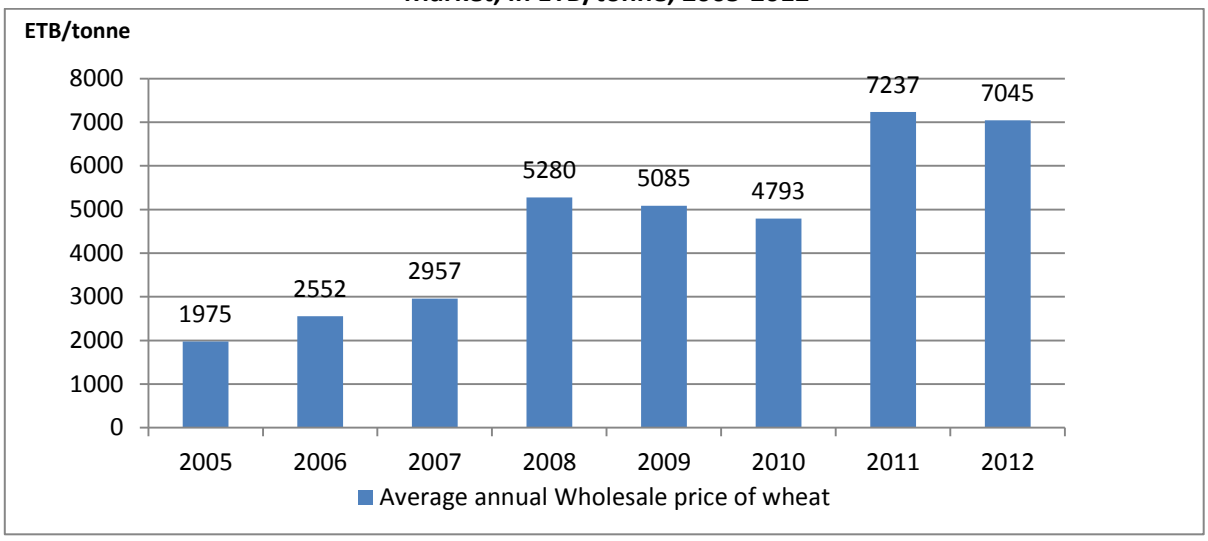
DOMESTIC PRICES

Observed prices at point of competition

Domestic prices refer to prices at the point of competition and farm gate. The domestic price at the point of competition represents the price at the wholesale market where domestic wheat competes with imported wheat. For this analysis, the price for white wheat (bread wheat) in the Ehil Berenda market of Addis-Ababa was used (Figure 13). Addis Ababa is indeed considered the main central market for wheat in the country (see MARKETING AND TRADE). The data comes from the EGTE, which collects data for several markets in Ethiopia and is considered a reliable source.

Figure 13 shows an increasing trend of domestic wheat prices at the point of competition. Prices increased at an average rate of 23 percent over the 2005-2012 period, with a maximum of 79 percent in 2008 and followed by 51 percent in 2011. The prices surged in 2008 and 2011, corresponding to the global food price crisis of 2008 and the lesser food price hike of 2011.

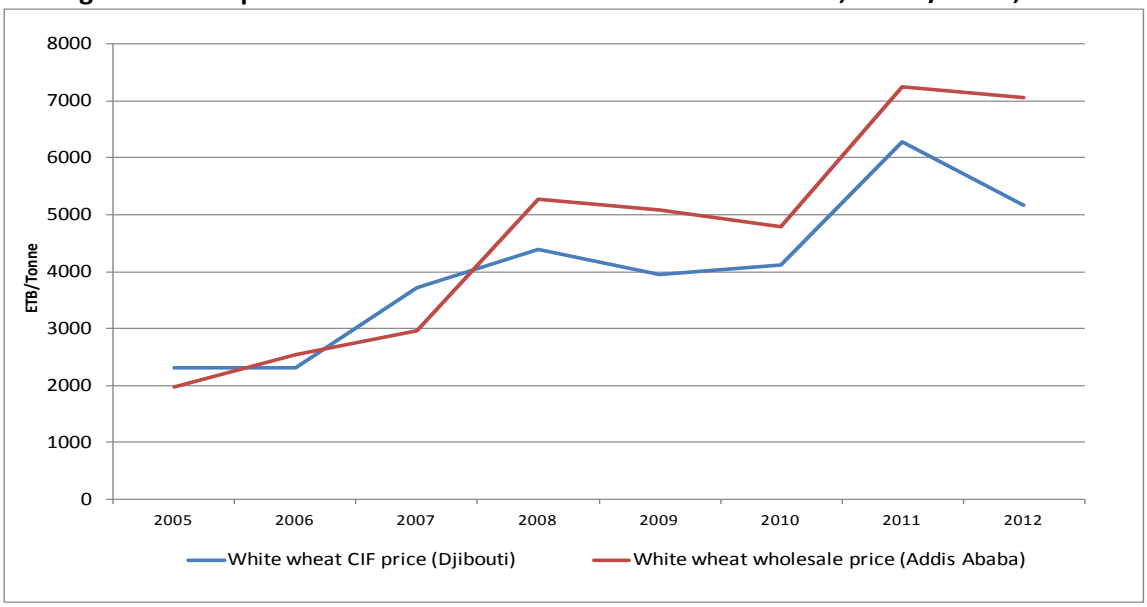
Figure 13: Annual Average Wholesale Price for Bread Wheat at Point of Competition Addis Ababa Market, in ETB/tonne, 2005-2012



Source: computed from EGTE data, 2014

Although all efforts have been made by the analysts to use the best data available, certain inconsistencies would require additional investigations. Indeed, the CIF price for bread wheat in 2005 and 2007 was higher than the wholesale price for the same imported wheat in Addis Ababa (see Figure 14). This either suggests that (i) there was an under-declaration of volumes of imported wheat in port Djibouti, which is a possibility, as it is known that fraudulent under-declaration practices are not uncommon in Djiboutian customs; (ii) wheat importers have been using their produce directly into integrated value chains and then sell it to millers to produce flour; and/or (iii) wheat importers sold at a loss during these two years, possibly because of excessively low domestic wheat prices. This is very plausible for 2007, at least, as the Horn of Africa suffered from a food crisis in 2006 that resulted in important food aid programmes targeting, notably, Ethiopia. It has been demonstrated that food aid, especially for wheat in Ethiopia (Levinsohn, McMillan, 2007), can depress domestic wheat prices.

Figure 14: Comparison of Bread Wheat CIF and Wholesale Prices, in ETB/tonne, 2005-2012



Source: ERCA, EGTE, 2014

Observed prices at farm gate

The data for the farm gate price for white wheat in the rural market of Hosaena was used for this analysis. The farm gate prices for Hosaena are reported by the EGTE and CSA. The EGTE prices are used in the analysis because of their correlation with the national inflation rate and for uniformity of data sources (see Table 7).

The national inflation rates for cereal prices in 2008 and 2011 were at 99 and 34 percent and the inflation rates of farm gate prices from CSA were at 55 percent and 32 percent, respectively, which are low compared to the growth rate computed for EGTE prices (82 percent and 67 percent for 2008 and 2011).

Furthermore, the average difference between the EGTE's farm gate price and that of CSA is 11 percent, with the highest differences being in 2007, 2008 and 2011 (Table 7).

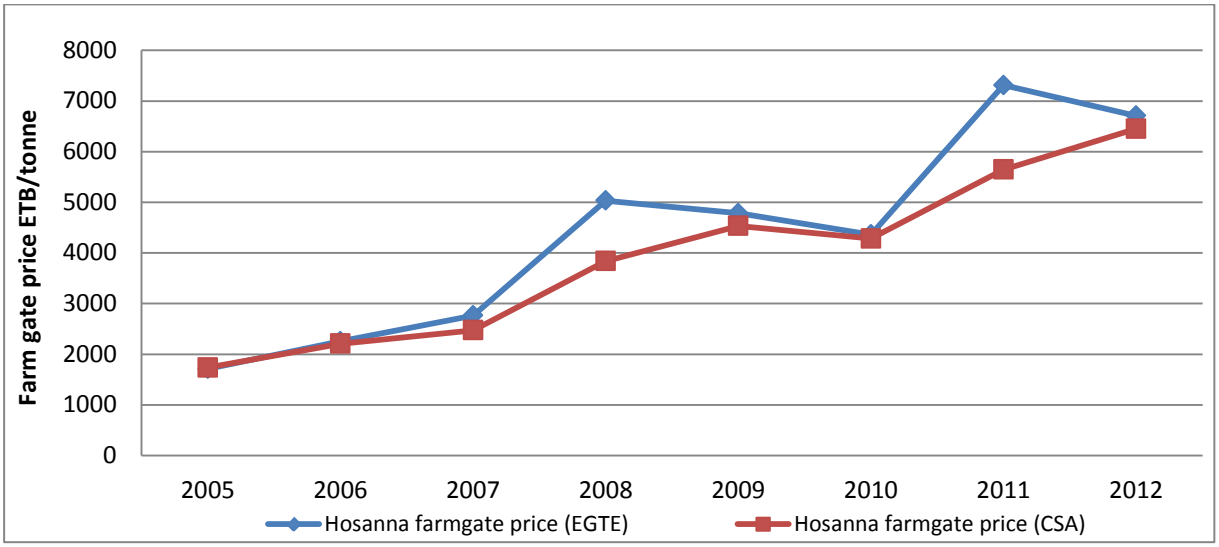
Table 7: Annual Average Farm Gate Price in Hosaena of White Wheat from Two Sources, EGTE and CSA, in ETB/tonne, 2005-2012

	Unit	2005	2006	2007	2008	2009	2010	2011	2012
Hosaena farm gate price (EGTE)	ETB/tonne	1713	2256	2763	5034	4782	4364	7313	6709
Hosaena farm gate price (CSA)	ETB/tonne	1737	2207	2472	3837	4533	4285	5647	6451
Price differential	%	1	2	12	31	5	2	30	4

Source: EGTE and CSA, 2014

Excluding these three years, the average difference was less than 5 percent. The reason behind these important differences in 2007, 2008 and 2011 is difficult to know, but one factor could be the price hike of cereals at both domestic and international levels during those specific years (Figure 15).

Figure 15: Annual Average Farm Gate Price of White Wheat from EGTE and CSA, in ETB/tonne, 2005-2012



Source: Authors, from EGTE and CSA data

EXCHANGE RATES

Observed

The observed annual exchange rates are derived from daily exchange rates applied in inter-bank transactions by the National Bank of Ethiopia.[12] Between 2005 and 2012, the rates increased from Birr 8.67 to Birr 17.60 per USD (Table 10).

Table 8: Observed Exchange Rate in Ethiopia, in Birr/tonne, 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Exchange rate (Birr per US$1)	8.67	8.74	9.21	9.80	12.10	12.89	16.90	17.60

Source: National Bank of Ethiopia, 2014

Adjusted

Ethiopia adopts a floating exchange rate that is under strong government control. The National Bank of Ethiopia is the sole provider of foreign exchange, and only authorized banks and investors who are able to bid for at least USD 0.5 million are allowed to participate in the weekly foreign exchange auction. The marginal rate of each auction (once a week) serves as the official rate until a new rate is established in the next round (a week later).

It is believed that the domestic currency (Birr) was overvalued over the 2008-2012 period, especially in 2008, 2009 and 2010 (Demeke, 2012). The extent of overvaluation was estimated at 40 percent during this period and thus the government was forced to devalue the Birr by 25 percent in September 2010 (Rashid, 2010). Another study (Dorosh, et al., 2009) showed that the real exchange rate appreciated by 9.7, 12.8, 14.9 and 33.8 percent in July 2005, July 2006, July 2007, July 2008 and by 26.3 percent June 2009, respectively. The major causes of currency appreciation in Ethiopia are the high rate of inflation (relative to the low inflation rate among its trading partners) and the increasing pressure on foreign exchange reserves. Between 2005 and 2008, inflation rates hit double digits and then declined to 8.5 and 7 percent in 2009 and 2010, only to increase again to 35 and 21 percent in 2011 and 2012 (CSA).

In 2007 and 2008, the foreign currency reserve fell short of the critical requirement of 12 weeks' worth of imports and so the government instituted foreign exchange rationing (Rashid, 2010). In March 2008, access to foreign exchange for imports was rationed to curb the excessive drawdown of foreign exchange reserve.

For this analysis, it is assumed that the local currency was overvalued, on average, by 20 percent during the period 2005-2010. The exchange rate has been adjusted accordingly in our calculation of adjusted reference prices (Demeke, 2012). Similarly, in 2011 and 2012, a respective adjustment rate of 13 and 12 percent was taken, as per the information from the IMF and the World Bank. The adjustment factor approximates the depreciation of the local currency, had a more liberal fiscal policy been pursued.

[12] http://www.nbe.gov.et/market/dailyexchange.html

Table 9: Observed and Adjusted Exchange Rate ETB/USD (annual average), 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Observed (ETB per US$1)	8.67	8.74	9.21	9.80	12.10	12.89	16.90	17.60
Adjusted (ETB per US$1)	10.40	10.49	11.05	11.76	14.52	15.47	19.10	19.70

Source: National Bank of Ethiopia; IMF and World Bank for 2011 and 2012

ACCESS COSTS

Observed

Border to point of competition

Observed access costs from the Djibouti Port (border) to Addis Ababa (wholesale) include a surtax and withholding tax, port handling, transport, unloading and miscellaneous costs (equal to 1 percent of the CIF price).

The cost estimates for the surtax, port handling and unloading are based on a USAID Bellmon study (USAID, 2010). Over the years, the variations in the costs from the USAID study correspond to access costs obtained from major grain traders and trade associations for 2005-2010, which confirms their reliability. They have been updated for the following years using the Consumer Price Index for Ethiopia, and information from the EGTE and importers.

The transport costs were obtained from the EGTE (and Ethiopian Shipping lines) for 2012. The 2012 figures were deflated using the transport inflation rate for each year before 2012 (CSA, 2013).

The information provided by importers indicates that the margin on imported wheat is about 3 percent of the CIF price, unlike the case for exports, where traders applied higher margins. Until the end of 2012, the port handling fees did not change, and the license fees were estimated as 2 percent of margins. The three cost items are strongly correlated to the CIF price, due to the method used to estimate them and this is considered to be consistent with the reality. In 2009, for example, the CIF price decrease by 27 percent resulted in a slight drop in access costs for that year, as traders squeezed their margins and minor access costs to compensate for their losses.

Table 10: Access Costs from Djibouti to Addis Ababa for White Wheat, in ETB/tonne, 2005-2012

	Unit	2005	2006	2007	2008	2009	2010	2011	2012
Surtax and withholding tax	ETB/Tonne	51	62	83	119	97	92	106	106
Port handling	ETB/Tonne	233	233	233	233	233	233	233	233
Transport costs	ETB/Tonne	341	370	415	467	494	602	817	850
Unloading	ETB/Tonne	32	32	32	32	32	32	32	32
Margins	ETB/Tonne	69	69	112	132	118	124	188	155
Miscellaneous (1% of CIF)	ETB/Tonne	23	23	37	44	40	41	63	52
License fee (2% of margin)	ETB/Tonne	1	1	2	3	2	3	4	3
Total costs	ETB/Tonne	751	791	914	1029	1016	1127	1443	1431

Source: Demeke and Di Marcantonio (2013) and estimated through EGTE/ESL/importers' discussion for 2011 and 2012.

Transport costs, the major component of total access costs between Djibouti and Addis Ababa, more than doubled between 2005 and 2012 in nominal terms. This is partly due to the country's inflation rate, although the increase of transport costs is not proportional to general inflation after 2008 (see Table 11). The surge in fuel prices in 2008 is another reason for increased transport costs.

Table 11: Comparison of MAFAP Wheat Transport Costs Increase Between Djibouti and Addis Ababa and Inflation Rate in Ethiopia (%), 2006-2012*

	Unit	2006	2007	2008	2009	2010	2011	2012	Flat average
Transport costs increase (MAFAP)	%	9	12	13	6	22	36	4	14
Inflation rate	%	12	17	44	8	8	33	23	21

Source: MAFAP, CSA, 2013, World Development Indicators, 2014* The transport costs for 2006-2011 were calculated using the CSA transport inflation rate on 2012 transport costs collected from traders.

Access costs between Djibouti and Addis Ababa for all years, except 2009 and 2012, exceeded the price differential between the port of Djibouti and the Addis Ababa wholesale market (Table 12). This suggests that for those years (i) traders sold at a loss, on average, which is plausible because of the significant wheat food aid that Ethiopia frequently received over the 2005-2012 period (as already discussed in the DOMESTIC PRICES section), and this food aid tends to depress domestic wheat prices in Ethiopia (Levinsohn, McMillan, 2007); and/or (ii) traders reported overestimated access costs during interviews with the analysts; and/or (iii) there are inaccuracies in the wholesale prices. The ratio of the total differential over the CIF price is particularly high in 2005 and 2006, which suggests that the biggest source of price distortions of wheat aid and/or data misreporting lies within these two years. For 2007, 2009 and 2012, the negative differential could very well be due to noise in the price data used in the analysis, e.g., in 2007, had the wholesale price figure been 4 percent higher (possibly with more accurate information from traders, who tend to underestimate the prices they report), then there would not have been a negative differential between the access costs and the Djibouti-Addis Ababa price differential.

Table 12: Comparison Between the Price Differential Between the Port of Djibouti and the Addis Ababa Wholesale Price for Wheat, and the Access Costs Between the Port of Djibouti and the Addis Ababa Market for Wheat, in ETB/tonne, 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Price differential	333*	-240	770*	-891	-1138	-673	-963	-1871
Access costs	751	791	914	1029	1017	1126	1443	1431
Total differential	-419	551	-144	138	-122	453	480	-440
Ratio of the differential over wholesale price	18%	24%	4%	3%	3%	11%	8%	8%

Source: Authors, from EGTE, 2014, ERCA, 2014, interview with traders* The positive differential for these years is discussed in the DOMESTIC PRICES section.

Farm gate to point of competition

Marketing costs from Hosaena to Addis are based on the information gathered from group discussions with traders, brokers and traders' associations at the Addis Ababa central grain market. The marketing costs include costs for loading, transport, brokers' fees for trucks, unloading, storage, losses, and broker's fees for selling wheat in Addis and margins for traders (Table 13).

As per discussions with traders, the margins were lowered from 2008 to 2012 to reflect the decline in margins from 2008 that were reported by traders and by a recent study (Rashid and Negassa, 2011). In fact, traders have indicated that their profits have declined with soaring prices, especially in 2011 and 2012, as most customers have cut back on their purchases.

In addition, the brokers' fee, loading and unloading and other costs have escalated after 2010, doubling between 2010 and 2011 from 50 ETB/tonne to 105 ETB/tonne.

Table 13: Observed Access Costs Hosaena to Addis Ababa for Wheat, ETB/tonne, 2005-2012

	Unit	2005	2006	2007	2008	2009	2010	2011	2012
Handling (Loading)	ETB/tonne	10	13	15	30	30	40	96	120
Transportation costs	ETB/ tonne	133	146	199	252	292	331	243	300
Broker fees for truck - per ton	ETB/ tonne	3	12	8	28	24	20	16	20
Brokers' fee for selling grain in Addis	ETB/ tonne	10	10	15	20	25	30	84	100
Estimated margins for traders	ETB/ tonne	350	350	350	300	300	250	250	250
Other costs (e.g., levies)	ETB/ tonne	5	5	5	5	10	10	10	10
Total costs	ETB/ tonne	511	536	592	635	681	681	699	800

Source: Based on information collected from traders and trader association at the central grain market, Ehil Berenda, Addis Ababa, 2014

Transport costs represent the major component of total access costs, and have more than doubled between 2005 and 2012, mainly due to the high fuel cost and high rate of inflation in the country (see Table 14). On average, the observed transport costs per km per tonne were 100 percent higher than those reported along the Djibouti-Addis Ababa road over the period.

Table 14: Comparison of MAFAP Wheat Transport Costs Increase Between Addis Ababa and Hosaena and Inflation Rate in Ethiopia, 2006-2012 (%)

	Unit	2006	2007	2008	2009	2010	2011	2012	Flat average
Transport costs increase (MAFAP)	%	22	31	26	11	37	65	14	29
Inflation rate	%	12	17	44	8	8	33	23	21

Source: MAFAP, 2013, World Development Indicators (2014)

For all years of the analysis, access costs between Hosaena and Addis Ababa outmatched the price differential between the market of Hosaena and the market of Addis Ababa (Table 15). This suggests that for those 3 years (i) traders sold at a loss, on average; and/or (ii) reported overestimated access costs during interviews with the analysts; and/or (iii) there were inaccuracies in the farm gate and/or wholesale prices datasets. In addition, it is important to note that in 2011, the wholesale price was below the farm gate price, which requires further investigation over the specifics of the Hosaena-Addis Ababa wheat trade and price fluctuations over that year. The ratio of the total differential over the wholesale price does not exceed 7 percent in 2008, 2009, 2010 and 2012. The negative differential could thus be due to noise in the price data used in the analysis, e.g., in 2010, had the wholesale price figure been 5 percent higher (possibly with more accurate information from traders, who tend to underestimate the prices they report), then there would not have been a negative differential between the access costs and the wholesale-farm gate prices.

Table 15: Comparison Between the Price Differential Between Hosaena Farm Gate and the Addis Ababa Wholesale Prices for Wheat, and the Access Costs Between Hosaena and Addis Ababa for Wheat, in ETB/tonne, 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Price differential	262	296	194	246	303	429	-76	336
Access costs	511	536	592	635	681	681	699	800
Total differential	-249	-240	-398	-389	-378	-253	-775	-464
Ratio of the differential over wholesale price	13%	9%	13%	7%	7%	5%	11%	7%

Source: MAFAP, 2014, from EGTE and interviews with traders

Adjusted

Border to point of competition

Adjusted access costs reflect the costs that would prevail in an efficient value chain. The observed access costs were thus adjusted by deducting the surtaxes and withholding taxes that are currently applied on wheat imports. During 2005-2012, these costs represented an average 8.5 percent of the observed access costs from the border to point of competition.

Observed transport costs are within the range of efficiency estimated by a USAID study (USAID, 2010), i.e. from 6.1 to 7.4 USD cents/tonne/km, and thus they were not adjusted.

Despite being considered potentially excessive, margins were not adjusted due to insufficient information.

Table 16: Calculation of Adjusted Access Costs Between the Port of Djibouti and Addis-Ababa for Wheat in Ethiopia, in ETB/tonne, 2005-2012

		2005	2006	2007	2008	2009	2010	2011	2012
1	Observed access costs	751	791	914	1029	1017	1126	1443	1431
2	Surtax and withholding tax	51	62	83	119	97	92	106	106
3	Adjusted access costs (1-2)	700	729	831	910	919	1034	1337	1325

Source: Authors

Farm gate to point of competition

Adjusted transport costs are obtained by reducing the observed transport costs by 1 to 30 percent (Table 17). The adjustment is intended to reduce transport costs to between 6.1 and 7.4 US cents/km/tonne (an average 6.75 US cents/tonne/km, which is slightly higher than the rates charged along the Djibouti – Addis Ababa road).[13]

[13] Demeke (2012) discussed that government's report indicated that the price/ton/km of transporting commodities via the Djibouti corridor is very high compared to other countries: the price/ton/km in Ethiopia is 6 US cents, compared to 2.3 cents in Pakistan or 4 cents in Brazil. The high cost is associated with excessive downtime and high inefficiency in fuel consumption. On average, a vehicle can make a maximum of 3 round trips per month, while it is possible to do 5. For instance, a newspaper, 11 Feb (2012): http://www.thereporterethiopia.com/News/govt-to-tighten-grip-on-trade-logistics.html.

Brokers' fees for truck and grain sale were also adjusted. In fact, such fees are considered excessive and would be lowered with measures that would increase market information and producers' bargaining power such as farmer cooperatives, expansion of mobile networks and information systems on truck availability. It is assumed from discussions with brokers that such measures would contribute to more efficient grain marketing, thus reducing brokers' fees by half.

There is no reliable information to adjust the margin, which may require a deeper study.

Table 17: Adjusted Access Costs from Addis Ababa to Hosaena for Wheat, ETB/tonne, 2005-2012

		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
1	Observed access costs	511	536	592	635	681	681	699	800
2	Inefficiencies in transport costs	14	15	40	76	88	99	3	24.4
3	Inefficiencies in broker fees for grains	6.5	11	11.5	24	24.5	25	50	60
4	**Adjusted access costs (1-2-3)**	**491**	**510**	**541**	**535**	**569**	**557**	**646**	**716**

Source: Authors, from interviews with traders, 2014

BUDGET AND OTHER TRANSFERS

Budget transfers for wheat were not identified in the write-up of this note, but may be revised based on MAFAP agricultural expenditure analysis.

QUALITY AND QUANTITY ADJUSTMENTS

There are no indications of significant quality or quantity differences between the wheat at the border, point of competition and producer level, therefore no adjustments are applied in our analysis.

DATA OVERVIEW

Following the discussions above, the table below summarizes the main data sources used and methodological decisions taken for the analysis.

Table 18: Data Sources and Methodological Decisions

		Description	
Concept		***Observed***	***Adjusted***
Benchmark price		*CIF price calculated as the unit value from import data reported in ERCA on imports of bread wheat (HS Code 100190, see Table 6). ERCA's figures were preferred to those of UN Comtrade because of their greater reliability (Figure 13).*	*No adjustment is possible given the current information*
Domestic price at point of competition		*Annual average wholesale price of white wheat (bread wheat) in Addis Ababa market as reported by EGTE is used. The annual average is computed from the weekly average wholesale prices.*	*N.A.*
Domestic price at farm gate		*Annual average farm gate price of white wheat (bread wheat) around Hosaena as reported by Ethiopia Grain Trade Enterprise (Table 7) is used. The annual average is computed from weekly averages.*	*No adjustment is necessary given the available information*
Exchange rate		*Annual average of exchange rate as reported by National Bank of Ethiopia (see Table 8)*	*Adjustment between 12 and 20 percent, assuming an overvaluation as reported by Rashid (2010) from 2005 to 2010 and adjustment factor from IMF for 2011 and 2012 (Table 9)*
Access cost from the point of competition to the border		*For loading, surtax and withholding, transport costs as reported in USAID, USAID Office of Food For Peace Ethiopia, Bellmon Estimation, Annex 1 Economic Data and Trends, September 2011(see Table 9). Transport costs are obtained from EGTE and ESL for 2012 and deflated for other years. Margins are obtained from interviews with traders.*	*Surtax and withholding taxes are deducted from the observed access costs.*
Access costs from the point of competition to farm gate		*Loading, transportation costs, broker fees for truck - per tonne, brokers' fees, trader's margin as estimated by a group of traders in the Addis Ababa wholesale market*	*1) Transportation costs adjustment to reduce transport cost to 6.75 US cents/km/tonne).* *2) Broker's fees for grains divided by 2.*
QT adjustment	Bor-PoC	*N.A.*	*N.A.*
	PoC-FG	*N.A.*	*N.A.*
QL adjustment	Bor-PoC	*N.A.*	*N.A.*
	PoC-FG	*N.A.*	*N.A.*

The data used for this analysis is summarized below.

Table 19: Data for Wheat Price Analysis

		Year	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*
		trade status	**m**	**m**	**m**	**m**	**m**	**m**	**m**	**m**
DATA	*Unit*	*Symbol*								
Benchmark Price										
Observed	USD/tonne	$P_{b(int\$)}$	**266.15**	**264.54**	**404.62**	**447.81**	**326.18**	**319.58**	**371.24**	**294.00**
Adjusted	USD/tonne	P_{ba}								
Exchange Rate										
Observed	ETB/USD	ER_o	8.67	8.74	9.21	9.80	12.10	12.89	16.90	17.60
Adjusted	ETB/USD	ER_a	10.40	10.49	11.05	11.75	14.52	15.47	19.10	19.70
Access costs border - wholesale										
Observed	ETB/tonne	AC_{owh}	751.09	790.87	914.00	1,028.67	1,016.64	1,126.45	1,442.72	1,431.08
Adjusted	ETB/tonne	AC_{awh}	699.69	728.87	831.30	910.17	919.24	1,034.25	1,336.72	1,325.08
Domestic price at wholesale	ETB/tonne	P_{dwh}	**1975**	**2552**	**2957**	**5280**	**5085**	**4793**	**7237**	**7045**
Access costs wholesale - farm gate										
Observed	ETB/tonne	AC_{ofg}	511.00	536.00	592.00	635.00	681.00	681.00	699.00	800.00
Adjusted	ETB/tonne	AC_{afg}	490.50	510.00	540.50	535.00	568.50	557.00	646.00	715.60
Farm gate price	ETB/tonne	P_{dfg}	**1,713.00**	**2,256.00**	**2,763.00**	**5,034.00**	**4,782.00**	**4,364.00**	**7,313.00**	**6,709.00**
Externalities associated with production	ETB/tonne	E	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Budget and other product related transfers	ETB/tonne	BOT	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Quantity conversion factor (border - point of competition)	Fraction	QT_{wh}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Quality conversion factor (border - point of competition)	Fraction	QL_{wh}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Quantity conversion factor (point of competition – farm gate)	Fraction	QT_{fg}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Quality conversion factor (point of competition – farm gate)	Fraction	QL_{fg}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

SUMMARY OF INDICATORS

Table 20: MAFAP Price Gaps for Wheat in Ethiopia, (ETB/tonne), 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Trade status for the year	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
Observed price gap at point of competition	(1,084)	(551)	(1,684)	(138)	122	(453)	(480)	440
Adjusted price gap at point of competition	(1,493)	(952)	(2,346)	(897)	(570)	(1,186)	(1,191)	(72)
Observed price gap at farm gate	(835)	(311)	(1,286)	252	500	(201)	295	904
Adjusted price gap at farm gate	(1,264)	(738)	(1,999)	(607)	(305)	(1,057)	(468)	308

Source: Author's own calculations using data as described above.

Table 21: MAFAP Nominal Rates of Protection and Assistance Wheat in Ethiopia, (%), 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Trade status for the year	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
Observed NRP at point of competition	-35%	-18%	-36%	-3%	2%	-9%	-6%	7%
Adjusted NRP at point of competition	-43%	-27%	-44%	-15%	-10%	-20%	-14%	-1%
Observed NRP at farm gate	-33%	-12%	-32%	5%	12%	-4%	4%	16%
Adjusted NRP at farm gate	-42%	-25%	-42%	-11%	-6%	-20%	-6%	5%
Observed NRA at farm gate	-33%	-12%	-32%	5%	12%	-4%	4%	16%
Adjusted NRA at farm gate	-42%	-25%	-42%	-11%	-6%	-20%	-6%	5%

Source: Author's own calculations using data as described above.

Table 22: MAFAP Market Development Gaps for Wheat in Ethiopia, (%), 2005-2013

	2005	2006	2007	2008	2009	2010	2011	2012
Trade status for the year	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
Access costs gap to competition point (ACGwh)	51.4	62.0	82.7	118.5	97.4	92.2	106.0	106.0
Access costs gap to farm gate (ACGfg)	(20.5)	(26.0)	(51.5)	(100.0)	(112.5)	(124.0)	(53.0)	(84.4)
Exchange rate policy gap (EXRP)	(460.4)	(462.9)	(744.5)	(877.7)	(789.4)	(824.5)	(816.7)	(617.4)
International markets gap (IMG)	-	-	-	-	-	-	-	-

Source: Author's own calculations using data as described above.

5. RESULTS AND INTERPRETATION

MAFAP analysis is based on the comparison of domestic prices with reference prices at both farm gate and wholesale levels. Reference prices reflect prices that producers could get in the absence of domestic policy and market distortions. Price difference indicators between domestic and reference prices are calculated at wholesale and farm level (see details of the methodology used to calculate the indicators).

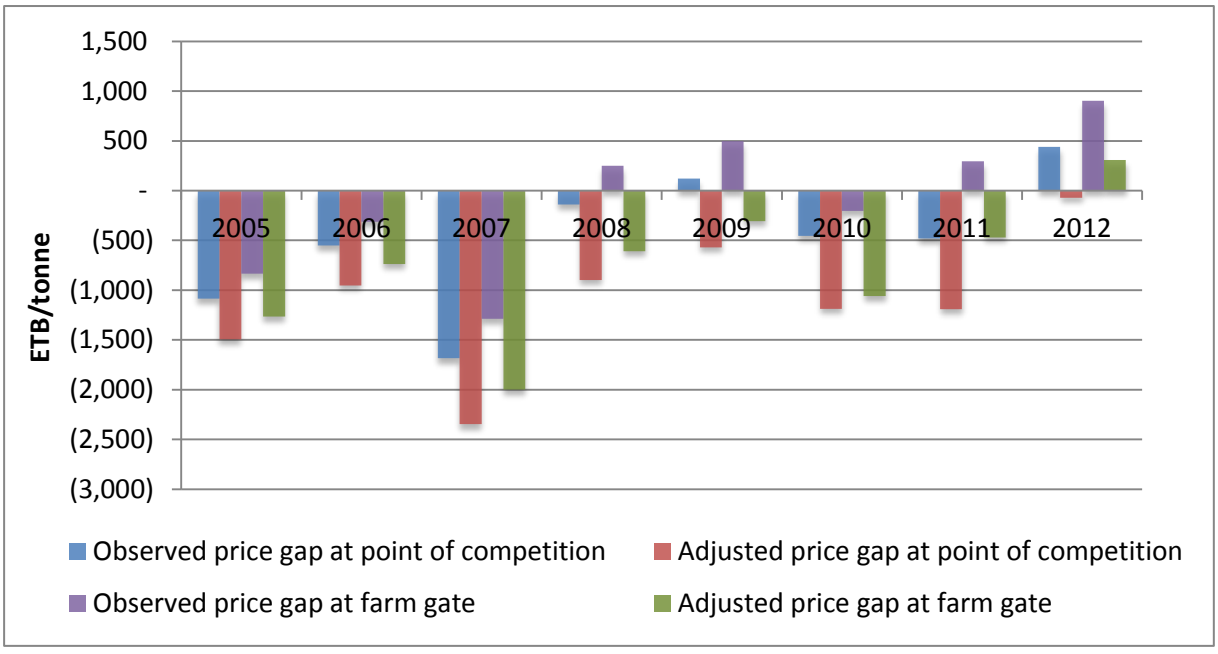
It is not unreasonable to expect that the policies in place during the review period in Ethiopia would generate price disincentives for wheat producers and wholesalers. Low volumes of exports due to the export ban and large volumes of imports are resulting in a strong domestic supply of wheat. One could reasonably expect that such a supply would depress the prices that producers receive. An overvalued exchange rate would have a similar effect of decreasing export trade flows because this would make the relative value of exports higher and hinder the competitiveness of Ethiopian wheat in the international market.

The analysis reveals that wheat producers in Ethiopia have generally received a price lower than what they would have received in the absence of these domestic policies until 2011. This means that the policies in place have created price disincentives to wheat production for the entire reference period, except 2012.

Price Gaps

The difference between the prices received by producers and the prices they would have received in the absence of price-distorting domestic policies is the price gap. The observed price gaps at producer and wholesale level were negative between 2005 and 2007, indicating price disincentives, but overall, they tended to become positive between 2008 and 2012, showing lower disincentives and in some cases, incentives.

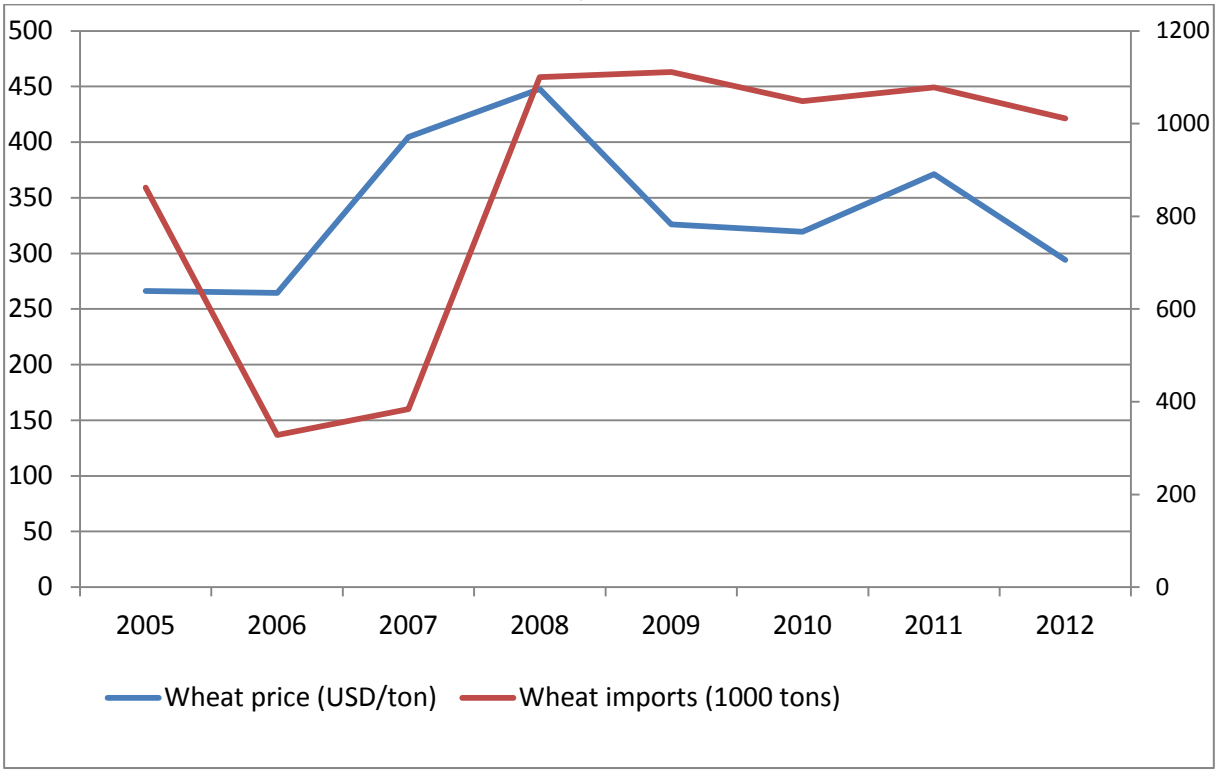
Figure 16: Observed and Adjusted Price Gaps at PoC and FG for Wheat in Ethiopia (ETB/tonne), 2005-2012



Source: Author's computation from the Annex I

In order to understand the price gap trend, it is crucial to examine the prices in the domestic market. In the years before 2007, the average annual prices for wheat at the point of competition and farm gate were very low. These prices were generally 136 percent and 151 percent lower than the respective average prices of the period 2008-2012. Farmers earned particularly low prices from 2005 to 2007, mainly because of the lack of exports (due to the export ban) and the high transaction costs of wheat marketing in the country. After 2007, the international price of wheat surged and the global wheat price increase was transmitted to domestic prices. Additionally, wheat imports in Ethiopia boomed in 2008 despite their price increase (Figure 17). In reaction to anticipated food shortages, the government imported very large quantities of wheat to increase food availability for the urban poor.

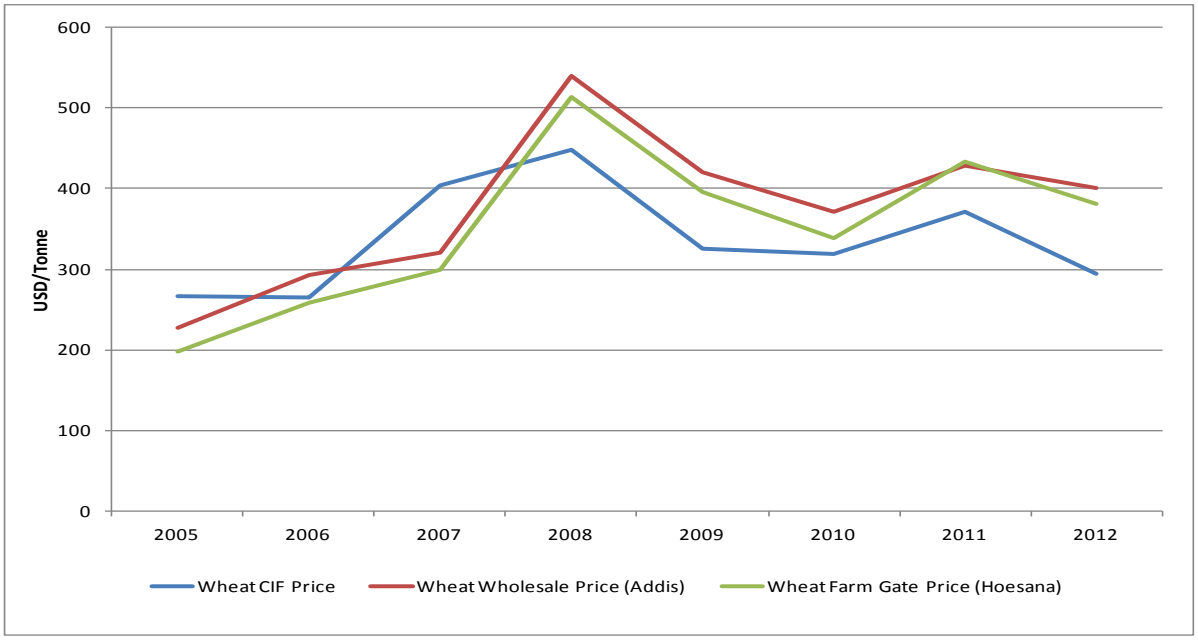
Figure 17: Comparison of Wheat Price and Wheat Imports in Ethiopia, in USD/tonne and 1,000 tonnes, 2005-2012



Source: Authors, from ERCA and UN Comtrade

It is clear that the price of imported wheat has a very strong impact on domestic prices, which follow (both at farm gate and point of competition level) a trend close to that of the CIF price (Figure 18), i.e. fading from 2007 to 2012. Although the CIF price declined, it did not plunge to the pre-2008 level, with an average of 352 USD/tonne from 2008-2012, as compared to 312 USD/tonne from 2005-2007. The waning international prices after 2007 could have stemmed from higher yields of wheat in developed countries (Figure 3), including the USA, which is a major import source for Ethiopian wheat.

Figure 18: Comparison of Wheat CIF, Wholesale and Farm Gate Price in Ethiopia, USD/tonne, 2005-2012

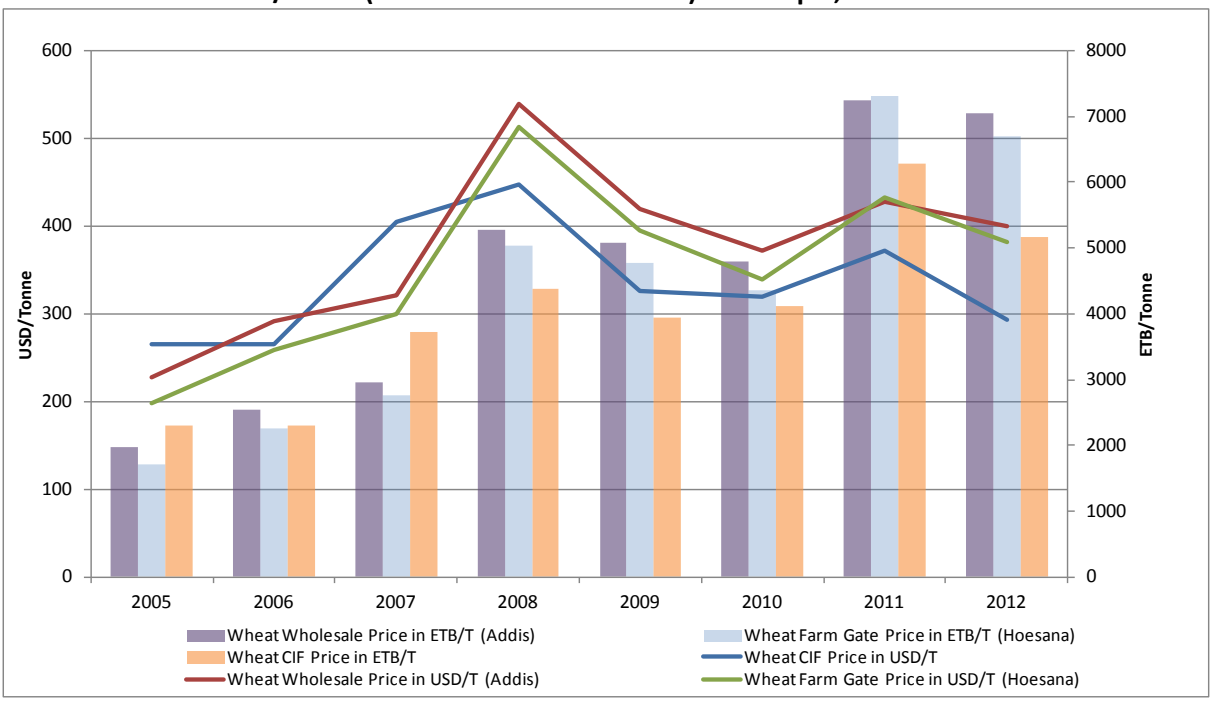


Source: Authors, from ERCA, EGTE and interviews with traders, 2014

In 2008, the impressive increase in domestic prices, relative to the international price (Figure 18), resulted in an improvement of the incentives environment in the country. After the great increase of international prices in 2007, the food price crisis hit the country and prices surged. The indicators show that numerous governmental policies aiming to control wheat volumes and prices in the country had an impact on the domestic market, e.g., the control of foreign exchange in March 2008 that deprived private actors from importing grains, which most likely had a depressing effect on wheat volumes in the country, and thus increased the domestic price, resulting in an informal foreign exchange market where a premium rate could have been used. This might have raised the cost of wheat imports, thereby increasing domestic prices and would not be reflected in the CIF price due to the informality of such practices. Furthermore, Ethiopia was hit by dramatic inflation that very year, affecting all sectors.

Besides controlling imports through foreign exchange, the EGTE was the sole institution authorized to import significant amounts of wheat in the country in order to sell it at subsidized prices. These trade policies, together with the extension of the export ban to all grains in 2008, actually depressed domestic prices, however, the indicators reflect a contradictory trend of an improvement of the incentive environment. In fact, agents received fewer disincentives in 2008, as well as incentives in 2009 at the farm gate and wholesale levels (Figure 16).

Figure 19: Comparison of Wheat Prices in USD/tonne (CIF, Wholesale and Farm Gate) and in ETB/tonne (Wholesale and Farm Gate) in Ethiopia, 2005-2012

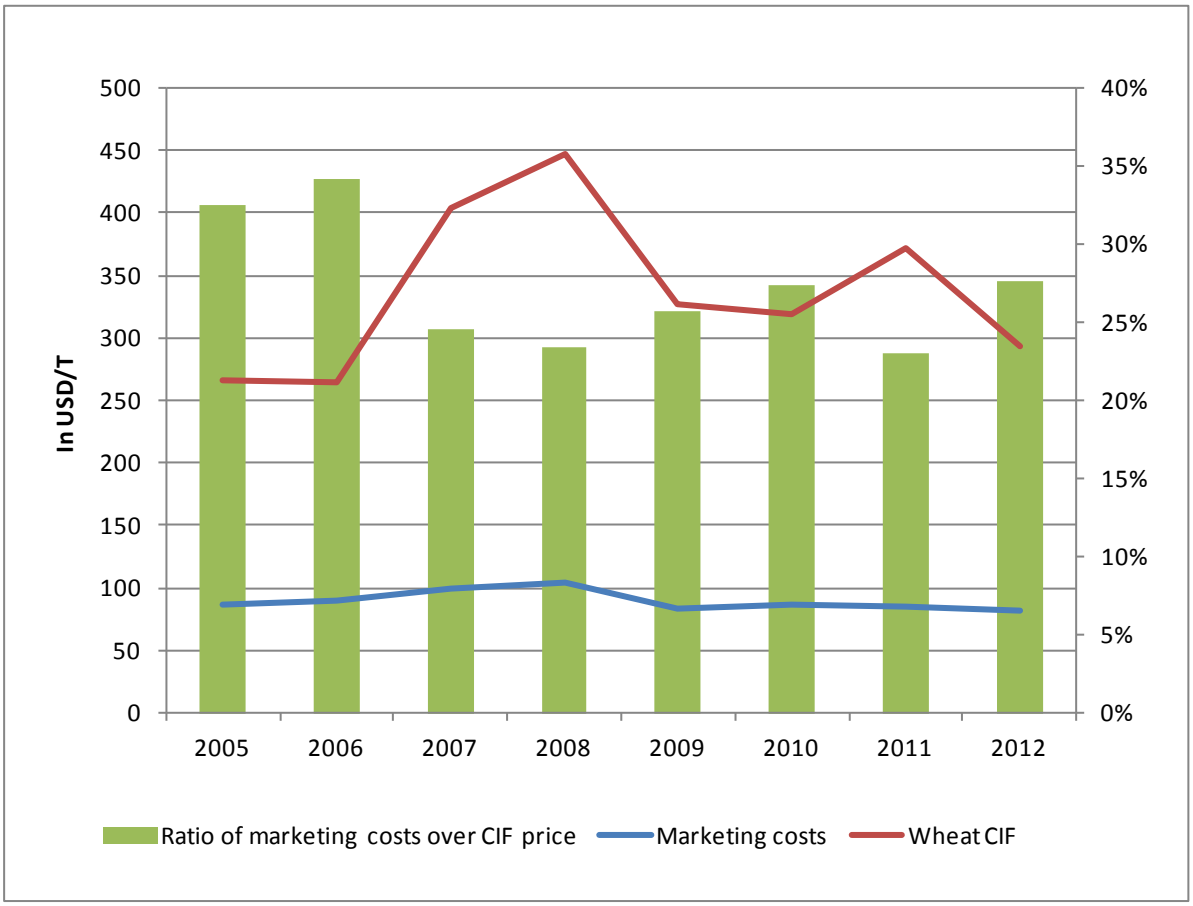


Source: Authors calculation from ERCA, EGTE, interviews with traders, NBE, 2014

When domestic prices are expressed in Ethiopian Birr/tonne and not in USD/tonne, they show a different picture. They followed an upward trend after 2007 (+33 percent) when compared to the wheat CIF price (-34 percent). The difference in the trends between domestic prices in ETB/tonne and USD/tonne are related to the devaluation of the Ethiopian Birr in 2011. The devaluation lowered the value of Ethiopian wheat on the international market, increased the price of imported wheat and thwarted the domestic price incentives that could have emerged from 2007 to 2012 (Figure 19). What's more, the devaluation of the Ethiopian Birr certainly had a price increasing effect on imported agricultural inputs, such as fertilizers, which presented a cost for producers. These increased costs might have contributed to the domestic wheat price increases after 2008.

The devaluation of the Ethiopian Birr, despite reducing production incentives through prices, provided stronger incentives for informal wheat exports to neighbouring countries by making Ethiopian wheat prices more attractive for buyers. This resulted in a global improvement of the wheat value chain and notably, of the marketing costs to transport wheat to Djibouti and other destinations after 2008 (see Figure 20). Such factors increased the share of the informal export price captured by producers by decreasing access costs to the border and increasing price transmission.

Figure 20: Trend of Marketing Costs Between Djibouti and Addis-Ababa for Wheat in Ethiopia, in ETB/tonne and %, 2005-2012



Source: Authors

The increase of wheat exports from Ethiopia to neighboring countries could also be caused by the massive imports from EGTE that somehow depressed prices. Indeed, massive imports were made by the government during the period, and sold high quality wheat at subsidized prices. This might have led to a rise of informal exports of the Ethiopian wheat to neighboring countries, where the population cannot afford high quality wheat.

In 2009, in the observed domain, there is a positive price gap at the wholesale and farm gate levels. This is due to a greatly reduced international wheat price compared to 2008 (27 percent), whereas the rate of decline of domestic prices was low, with only 4 percent and 5 percent at wholesale and farm gate levels, respectively. In the following year, the contrary happened and the price gaps became negative again. The contraction of domestic prices in 2009 and 2010 was mainly due to the steady increase of domestic production since 2009 and the large imports of wheat, with a decreasing CIF price (Figure 21).

Figure 21: Domestic Prices of Wheat (Farm Gate and Wholesale) in ETB/tonne and Wheat Production in tonnes, in Ethiopia, 2005-2012

Source: Authors calculation from EGTE, interviews with traders, 2014

In 2011, domestic prices substantially increased by 51 and 68 percent at wholesale and farm gate, whereas the international price only increased by 16 percent, which could be partially explained by the rise of access costs at both exporter and wholesaler level. This could also be due to an over-reaction of wholesalers to the minor food price hike of 2011, the latter raising their prices disproportionally when compared with the CIF price surge. The shift from teff, a more expensive food grain, to wheat (see Figure 5) could explain the faster increase in wheat's domestic prices, which would have led to an increased incentive for wheat producers in 2011 and 2012. Factors that could have led to the decrease in domestic prices include i) the bumper harvest of wheat in Ethiopia in 2012, which was about 3.4 million tonnes and increased by 18 percent compared to the harvest in 2011; and ii) there was a second price hike in 2011(the first in 2008) that prompted the government to import a record level of wheat. The imports in 2012 were also high and some level of inventory from 2011 is inevitable (USDA, 2013), thus it is surprising that the wholesale price slightly decreased in that year despite a record harvest. On the other hand, the international price of wheat decreased by 21 percent, which is much more than the domestic wholesale price.

The adjusted price gaps at farm gate level are negative and greater than the observed price gaps during the whole period of analysis, except for in 2011 and 2012. The higher price gaps in the adjusted domain are due to policy distortions (especially exchange rate policy) and market inefficiencies (e.g., due to infrastructure, types of vehicles used for transport, additional fees) (see ACCESS COSTS section). Even though the economic environment has improved over the years, in a value chain free of policy and market distortions, producers and wholesalers could have received a better price (see Table 23).

Table 23: MAFAP Price Gaps for Wheat in Ethiopia (ETB/tonne), 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Trade status for the year	m	m	m	M	m	m	m	M
Observed price gap at wholesale(PGowh)	-1084	-551	-1684	-138	122	-453	-480	440
Adjusted price gap at wholesale(PGawh)	-1493	-952	-2346	-897	-570	-1186	-1191	-72
Observed price gap at farm gate(PGofg)	-835	-311	-1286	252	500	-201	295	904
Adjusted price gap at farm gate(PGafg)	-1264	-738	-1999	-607	-305	-1057	-468	308

Source: Author's calculations

Nominal Rate of Protection

The range of the observed nominal rate of protection at wholesale is from -35 percent to 7 percent between 2005 and 2012 (Table 24). In 2008 and 2009, it should be noted that the economic environment neither gave significant incentives nor disincentives to wholesalers.

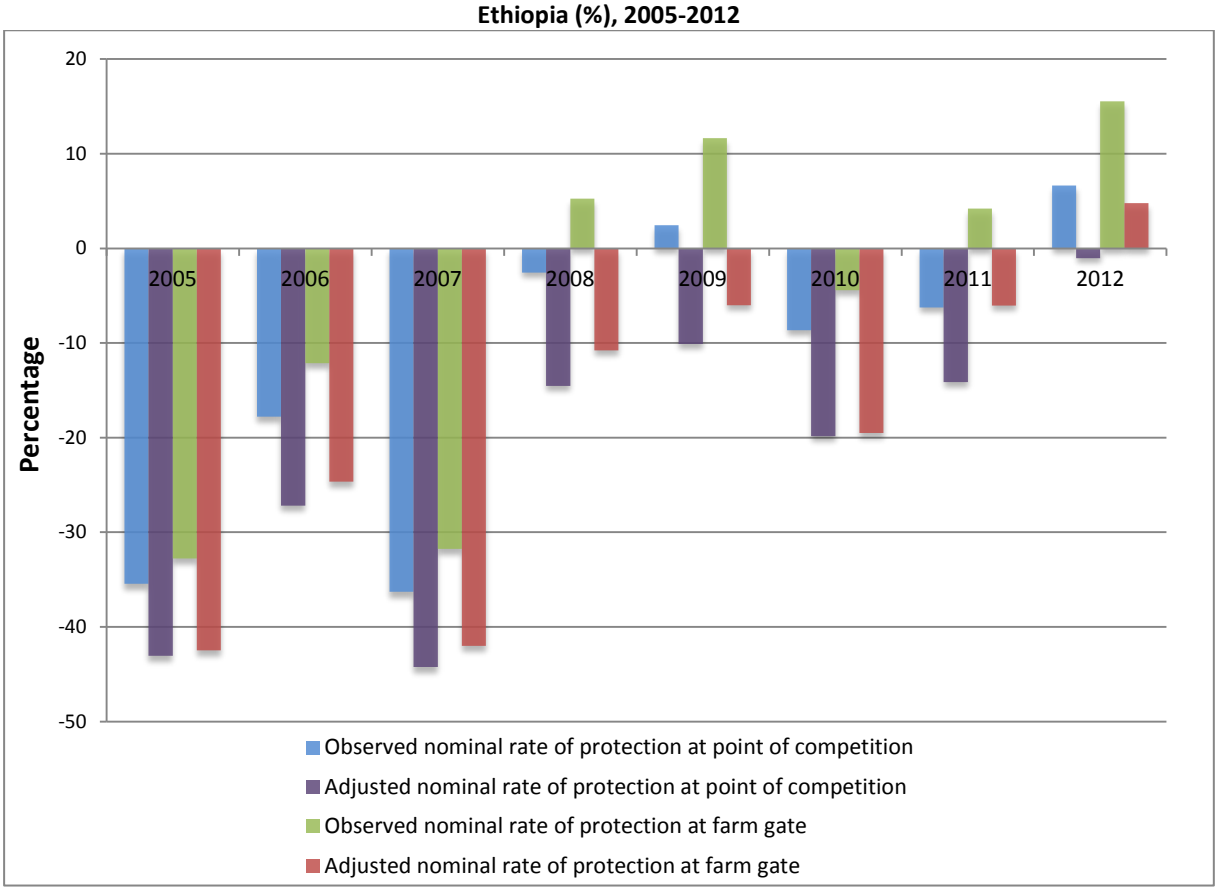
The nominal rate of protection at farm gate was negative until 2007 but positive thereafter, except in 2010. 2008 and 2009 can be considered a special case since the international price rose by 11 percent in the first year and then decreased by 27 percent in the following year. This price variation in the international market was vaguely transmitted to the domestic market due to a highly reactive response to the crisis. In fact, the domestic price at farm gate increased by 82 percent in 2008 and decreased by only by 5 percent in 2009. The increased price was due primarily to high domestic demand attributable to the shift from teff to wheat by low and middle-income groups. Real teff prices increased by 30 percent from mid-2007 to mid-2009, while wheat prices increased only by 7 percent (Rashid, 2010). The slight price decrease in 2009 could have been due to a reverse trend with a lower domestic demand, coupled with government restrictions on bulk purchase of grains from local markets (WFP, 2009).

Table 24: MAFAP Nominal Rates of Protection (NRP) for Wheat in Ethiopia 2005-2012 (%)

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Trade status for the year	m	m	m	m	M	m	m	m
Observed NRP at wholesale	**-35%**	**-18%**	**-36%**	**-3%**	**2%**	**-9%**	**-6%**	**7%**
Adjusted NRP at wholesale	**-43%**	**-27%**	**-44%**	**-15%**	**-10%**	**-20%**	**-14%**	**-1%**
Observed NRP at farm gate	**-33%**	**-12%**	**-32%**	**5%**	**12%**	**-4%**	**4%**	**15%**
Adjusted NRP at farm gate	**-42%**	**-25%**	**-42%**	**-11%**	**-6%**	**-20%**	**-6%**	**5%**

Source: Author's calculations based on our estimation

Figure 22: Observed and Adjusted Nominal Rate of Protection at Wholesale and Farm Gate for Wheat in Ethiopia (%), 2005-2012



Source: Author's computation from the Annex I

It is interesting to note that wholesalers have faced greater disincentives than producers throughout the period of analysis. This might be due to several policies directly affecting the wholesale market, specifically targeting the link between the domestic and the international market (export bans, control of foreign currency and overvaluation of the ETB).

However, the difference between the observed and the adjusted NRPs was larger at farm gate than at wholesale (average difference was 12 points and 10 points) (Figure 22), which could be due to better market integration by wholesalers over the period and a greater lack of efficiency in the farm gate to wholesale segment. However, inefficiencies between Djibouti and Addis Ababa played a role of protection for wholesalers, as they increased the cost of the imported commodity and made the local more competitive.

The main determinant of the difference between the adjusted domain for wholesalers and producers is the distortion coming from the exchange rate policy. In other words, when the difference between the observed and adjusted exchange rate is less, the difference between the observed and the adjusted NRP of wholesalers and producers is also smallest. Often, the inefficiencies accounted for in the access costs do not outweigh the effect of exchange rate distortion.

The Market Development Gap indicates the portion of the price gap that can be attributed to "excessive" access costs within a given value chain, exchange rate misalignments and imperfect functioning of international markets. Throughout the period of analysis, the ratio between the absolute Market Development Gap and the Reference Price at farm gate was rather low and completely stagnant for 6 years from 2005 to 2010 (Table 25 and Figure 24). This reflects a stable ratio in the relative protection of the market for farmers compared to the overall rise of international prices and reveals mainly the effect of the exchange rate policy. High access costs from Djibouti to Addis Ababa have affected (*i.e.* protected) the domestic market positively by raising the price of the imported commodity. In contrast, the exchange rate misalignment has distorted the market negatively, preventing agents from a better economic situation on the international market.

Table 25: Market Development Gap for Wheat in Ethiopia, 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Market Development Gap (ETB/tonne)	(429.54)	(426.95)	(713.30)	(859.21)	(804.46)	(856.32)	(763.73)	(595.80)
Market Development Gap (%)	(0.14)	(0.14)	(0.15)	(0.15)	(0.16)	(0.16)	(0.10)	(0.09)

Source: Author's computation from the quantitative information in Annex I

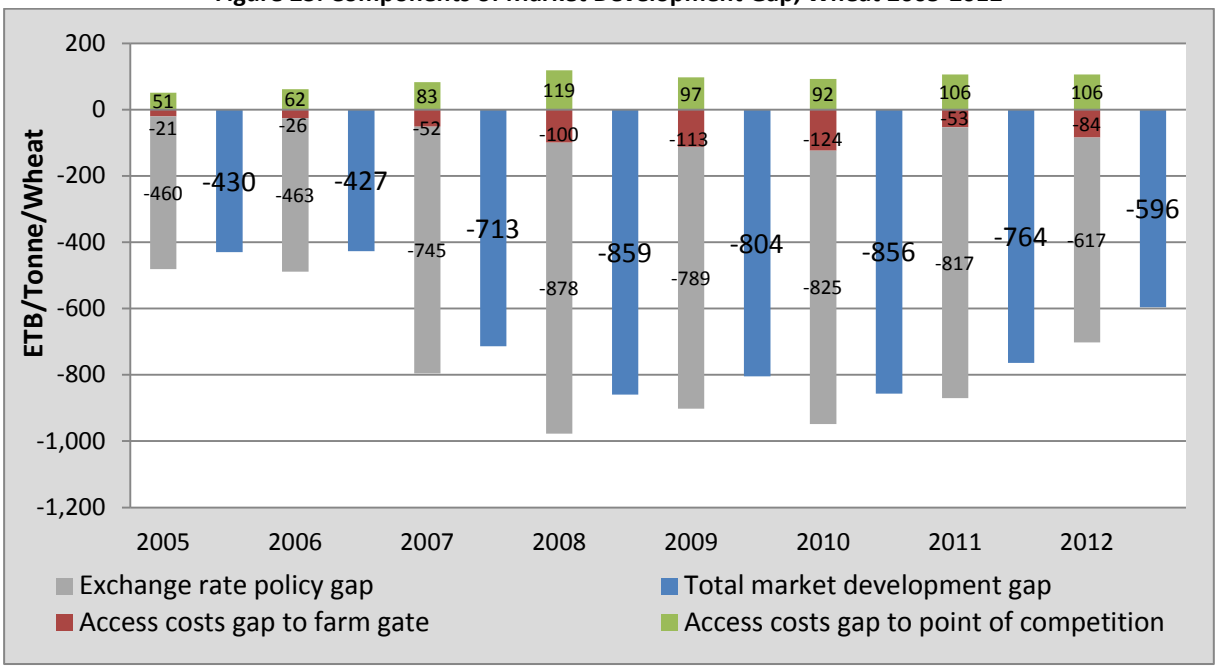
In 2011, the relative Market Development Gap dropped by 0.05 percent, while the absolute gap was decreasing as the reference price at farm gate level increased substantially (by 54 percent). Moreover, the reduction of the access cost gap to farm gate by 42 percent intensified the trend towards increased market integration for wheat producers. Here, it is important to recall that the access cost gap at the point of competition, even if it allows a reduction of the absolute Market Development Gap, is still a market distortion. Greater access costs from Djibouti to Addis lead to higher prices for the imported commodity, which acts as a positive market distortion in terms of protection to producers, whereas the other two components (exchange rate and market access cost from farm gate to wholesale) act as negative distortion of the market in terms of producer income (see Table 26).

Table 26: Components of Market Development Gap for Wheat in Ethiopia (ETB/tonne), 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Exchange policy gap	(460.44)	(462.95)	(744.50)	(877.71)	(789.36)	(824.52)	(816.73)	(617.40)
Access costs gap to point of competition	51.4	62.0	82.7	118.5	97.4	92.2	106.0	106.0
Access costs gap to farm gate	(20.5)	(26.0)	(51.5)	(100.0)	(112.5)	(124.0)	(53.0)	(84.40)

Source: author's elaboration based on the information in Annex 1

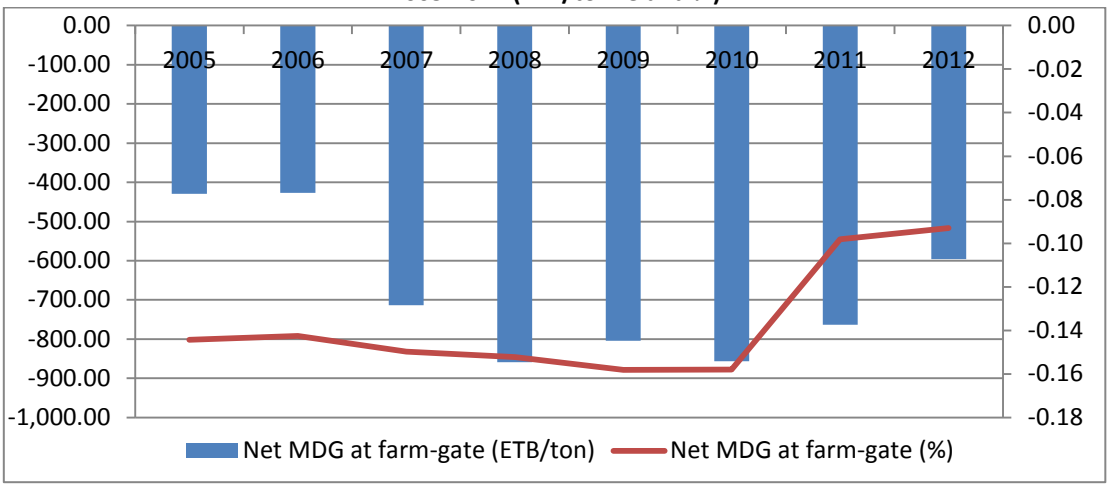
Figure 23: Components of Market Development Gap, Wheat 2005-2012



Source: Author's computation from the quantitative information in Annex I

This reduction of the market distortions (lower Market Development Gap) in 2011 could be a result of the devaluation of the Ethiopian Birr in September 2010. Indeed, the adjustment of the exchange rate has significantly reduced the negative impacts of the MDGs on producer prices (see Figure 24). Though the absolute values of access cost gaps and exchange rate misalignments did not change much over the two last years (Figure 23), the results in relative terms were amplified partly due to the sharp increase of domestic prices in those years. As a result, producers lost less thanks to the combination of high prices together with the currency devaluation.

Figure 24: Net Market Development Gaps (MDG) and Relative MDGs at Farm Gate for Wheat in Ethiopia, 2005-2012 (ETB/tonne and %)



Source: Authors

6. RECOMMENDATIONS

MAFAP indicators have shown that the level of disincentives for wheat farmers was substantial during the 2005-2007 period but shifted to incentives thereafter (except in 2010). Policy factors responsible for producer disincentives include the ban on cereal exports, overvalued exchange rates, underdeveloped markets, high levels of wheat imports (after 2008) and distribution of imported wheat at subsidized prices (at times of high food prices), all of which have kept domestic wheat prices below the reference prices.[14]Grain trading and associated transport and storage systems are based on high costs for small-scale transactions due to a small amount of capital and inadequate equipment, thus contributing to low farm gate prices, especially before 2007. On the other hand, significant inefficiencies between Addis Ababa and Djibouti have led to a rise in the price of imported wheat, having a protective effect on the domestic market.

Production incentives are observed after 2007, resulting from the correction of currency overvaluation in 2008 and 2011, escalated domestic prices in 2008, permission to export wheat to neighbouring countries (e.g., Sudan in 2012), and the improvement of access costs to the border in 2010 and 2011 (trucks carrying exports to Djibouti load imports on their way back to Addis Ababa), which kept domestic prices slightly above the reference prices.

The overall upward trend of policy and market impacts is in favor of all agents but especially the farmers. Over the period 2007-2012, value chain enhancements and rising prices have led to a greater price incentive situation.

However, the economic environment has still been chaotic over the past five years, with volatile levels of incentives. MAFAP results show that the combined effects of policy and market instability, policy induced market distortions and value chain inefficiencies that have characterized the period analyzed, result in greater volatility and unpredictability of the incentives structure.

With an improved policy environment and enhanced long-term investment in wheat production, the country has the capacity to meet domestic demand. Wheat could be grown more efficiently in many parts of the country, especially in medium and high altitude areas. As observed in a recent study of several African countries, Ethiopia included, domestic production of wheat can be economically profitable and could be competitive with imports, provided that the government invests to enhance the utilization of existing technologies through improvements in seed production and supply, agricultural extension, marketing infrastructure to reduce marketing costs, among others (Shiferaw, et al., 2011), cited in Demeke and Di Marcantonio (2013).

Preliminary recommendations:

- It is important for policy makers to reconsider measures such as grain export bans and sale of imported wheat at subsidized prices that have thus far resulted in depressed domestic prices and an implicit taxation of agriculture. According to the ATA, domestic production is increasing, but the marketable surplus remains at 20 percent. This share could increase if exports to neighbouring countries were allowed;

[14] Food aid flows are estimated to have depressed domestic prices within the ranges of 2 to 26 percent for wheat, 3 to 13 percent for maize, and 2 to 11 percent for teff during the period 1981 to 2002 (Rashid, Assefa and Ayele, 2007), but some argue that imports might have less depressing effect (Mellor, 2014).

- The control of the distribution of foreign currencies has also blocked the country from the international market. Overall Government control has resulted in a greater price incentives over the period, in the case of wheat, and has likely been affecting the poorest households, as wheat is a major staple commodity. Long-term and sustained consumer gain can only be achieved through improved producer incentive that translates into increased production, hence lower prices in the long run (Demeke and Di Marcantonio, 2013). Even low-income consumers are shifting towards wheat consumption due to the increasing price of teff, and this underlines the need to encourage wheat production by promoting export.
- Currency overvaluation throughout the period has also had a substantial impact on the domestic market and on wheat prices received by the agents since it has made international prices particularly cheap when compared to domestic prices. Since government interventions and food aid are often made up of wheat and are unpredictable, domestic wheat prices are low and volatile; hence, the government needs to give special attention to minimizing the impact of government imports by providing incentive to invest in wheat-related activities by farmers, traders, millers and warehouse operators.
- Though the government is upgrading and improving the overall level of infrastructure in the country, greater attention should be paid to introducing bulk transport systems that would reduce transport and transaction costs and provide better incentives to farmers, which would also give opportunities for wheat to be traded at the Ethiopian Commodity Exchange. Investment in heavy infrastructure, such as highways and railways, must continue if the high access costs for grain import and export are to be reduced. Grades and standards for specific kinds of wheat would also give the sector opportunities to be included fully in the ECX trading system and this would improve the traceability of the produce and provide the agents with an efficient market information system.
- Modernization of the information technology (IT) systems as well as investment in both physical and human resources that manage the IT services to traders and modernizing the loading and unloading equipment in grain markets (to overcome the increasing cost of labour) are essential. By modernizing the information system to include the quantity of wheat and other grain produced, policy makers would know the precise quantity produced (side-by-side the one estimated by CSA) in a particular season and would be able to decide on exports and imports.
- Promote the establishment of cooperatives and consumer associations and the expansion of information technology, which could improve grain marketing and ease the marketing process along the value chain, creating stronger bargaining power for producers.

7. CONCLUSION

MAIN MESSAGE

MAFAP findings indicate that the price gaps between reference prices at farm gate and observed farm gate prices were negative before 2007, suggesting that producers faced disincentives due to factors of inefficiency such as weak road infrastructure, an inefficient bulk transport system, big hands of brokers in the wheat market, and lack of an effective information system. The negative price gaps at wholesale indicate that the depressed domestic prices benefit wheat consumers since they paid much lower prices than the equivalent import parity prices. Moreover, producers and agents received incentives after 2007, indicating that they received better prices than the price prevailing in the international market (except in 2010). Since 2008, the environment for incentives/disincentives for agents along the value chain has generally improved. This could be linked to the results of correction of currency overvaluation in 2008 and 2011, escalated domestic and international prices in 2008, permission to export wheat to neighbouring countries (e.g., Sudan in 2012), improvement of access costs to border in 2010 and 2011 (trucks loading exports to Djibouti load imports on their way back home), and other unobserved factors that kept the domestic prices above the reference prices.

Still, the economic and policy environment has been somehow volatile over the period analyzed. Incentives and disincentives have been fluctuating back and forth between 2008 and 2012. It is shown that an efficient market, free of policy distortions and inefficiencies, would have resulted in greater disincentives during the whole period, which shows the significant unpredictability of the market.

The findings indicate that the Ethiopian Grain Trade Enterprise had a substantial role in the domestic market, especially at the wholesale level. Disincentives were greater at the wholesale level than at farm gate. The restricted export of wheat and high level of cheap wheat imports (on average about 31.4 percent of the domestic production during the period of analysis), which are sold at subsidized prices by the EGTE, likely depressed the domestic wheat market. Additionally, during periods of low expected domestic prices (bumper harvest), the EGTE bought wheat from the domestic market, thus supporting producer prices but overtook wholesalers.

LIMITATIONS

The data constraint of farm gate price is solved because of the farm gate price data obtained from the EGTE, which is comparable with that of CSA. However, conducting a purposeful survey annually to determine a reasonable farm gate price of wheat (and other selected commodities of MAFAP analysis) would improve the farm gate price and access costs from farm gate to point of competition.

Among access cost data, getting a reliable profit margin at all levels is a challenge. The margin is estimated based on export information rather than objective data.

As stated in the previous technical note, a series of validation by a research assistant is important after the data is collected. In this study, access to data was more difficult than the previous years because the EGTE did not have the data on their website. To overcome these limitations, validation was carried out by the EGTE and other traders after collecting the data.

FURTHER INVESTIGATION AND RESEARCH

Wheat is a major food item, especially in urban areas. Governments of developing countries often want to keep the price low for the urban poor. This will be sustainable when producer incentives are maintained and yield increases. The findings of this study show that the disincentive is declining but incentives cannot be sustainable. The reason why incentives are not sustainable is critical and requires further investigation.

In recent years, the Ethiopian Grain Trade Enterprise (EGTE) has been importing and exporting grains such as wheat. Even though the country has some advantages related to foreign currency, the kind of monopoly the EGTE is given could have long-term disadvantages and could be a point of further study.

This study emphasizes the role of export bans and exchange rate misalignment as components of producer disincentives. However, in 2009, an incentive rather than disincentive was found because of the high exchange rate misalignment and the export ban, indicating that other factors, e.g., increased domestic and international prices, are important.

There is a need to study and check the effects of policies affecting the input market (fertilizer, improved seed) and budgetary assistance to producers that aim to increase yields.

Additionally, in a diverse agro-ecology and business environment, other factors contributing to disincentives could be found. For instance, the analysis of distortions in input markets and distortions in the international market requires further investigation.

Sometimes when the commodity analyzed is less tradable on the international market (or because of inefficiencies), devaluation may not have the expected outcome of increasing producer incentives, but rather the devaluation may end in increasing the price of imported inputs such as fertilizer. This could stimulate the need to investigate the role of previous devaluations on price incentives and disincentives.

As it is well discussed in Demeke and Di Marcantonio (2013), it is essential to study the role of wheat as food aid in price depression, a role that is thus far debatable.

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ANNEX I: Data and Calculations Used in the Analysis

Name of product	WHEAT		Local currency	ETB
International currency	USD			

	DATA		Unit	Symbol	Year trade status	2005 m	2006 m	2007 m	2008 m	2009 m	2010 m	2011 m	2012 m
	Benchmark Price												
1		*Observed*	XXX/TON	$P_{b(int\$)}$		266.15	264.54	404.62	447.81	326.18	319.58	371.24	294.00
1b		*Adjusted*	XXX/TON	P_{ba}									
	Exchange Rate												
2		*Observed*	YYY/XXX	ER_o		8.67	8.74	9.21	9.80	12.10	12.89	16.90	17.60
2b		*Adjusted*	YYY/XXX	ER_a		10.40	10.49	11.05	11.76	14.52	15.47	19.10	19.70
	Access costs border - point of competition												
3		*Observed*	YYY/TON	ACo_{wh}		751.09	790.87	914.00	1,028.67	1,016.64	1,126.45	1,442.72	1,431.08
3b		*Adjusted*	YYY/TON	ACa_{wh}		699.69	728.87	831.30	910.17	919.24	1,034.25	1,336.72	1,325.08
4	**Domestic price at point of competition**		YYY/TON	P_{dwh}		1975.00	2551.67	2956.67	5279.55	5085.00	4792.50	7236.67	7045.00
	Access costs point of competition - farm gate												
5		*Observed*	YYY/TON	ACo_{fg}		511.00	536.00	592.00	635.00	681.00	681.00	699.00	800.00
5b		*Adjusted*	YYY/TON	ACa_{fg}		489.50	510.00	540.50	535.00	568.50	557.00	646.00	715.60
6	**Farm gate price**		YYY/TON	P_{dfg}		1,713.00	2,256.00	2,763.00	5,034.00	4,782.00	4,364.00	7,313.00	6,709.00
7	Externalities associated with production		YYY/TON	E									
8	Budget and other product related transfers		YYY/TON	BOT									
	Quantity conversion factor (border - point of competition)		Fraction	QT_{wh}									
	Quality conversion factor (border - point of competition)		Fraction	QL_{wh}									
	Quantity conversion factor (point of competition - farm gate)		Fraction	QT_{fg}									
	Quality conversion factor (point of competition - farm gate)		Fraction	QL_{fg}									

	CALCULATED PRICES		Unit	Symbol	2005	2006	2007	2008	2009	2010	2011	2012
	Benchmark price in local currency											
9		*Observed*	YYY/TON	$P_{b(loc\$)}$	2,307.52	2,312.08	3,726.55	4,388.54	3,946.78	4,119.39	6,273.96	5,174.40
10		*Adjusted*	YYY/TON	$P_{b(loc\$)a}$	2,767.96	2,775.02	4,471.05	5,266.25	4,736.13	4,943.90	7,090.68	5,791.80
	Reference Price at point of competition											
11		*Observed*	YYY/TON	RPo_{wh}	3,058.61	3,102.95	4,640.55	5,417.21	4,963.42	5,245.83	7,716.68	6,605.48
12		*Adjusted*	YYY/TON	RPa_{wh}	3,467.65	3,503.90	5,302.35	6,176.42	5,655.37	5,978.15	8,427.41	7,116.88
	Reference Price at Farm Gate											
13		*Observed*	YYY/TON	RPo_{fg}	2,547.61	2,566.95	4,048.55	4,782.21	4,282.42	4,564.83	7,017.68	6,075.48
14		*Adjusted*	YYY/TON	RPa_{fg}	2,978.65	2,999.90	4,765.85	5,651.42	5,098.87	5,431.15	7,806.41	6,411.28

	INDICATORS		Unit	Symbol	2005	2006	2007	2008	2009	2010	2011	2012
	Price gap at point of competition											
5		*Observed*	YYY/TON	PGo_{wh}	(1,083.61)	(551.28)	(1,683.88)	(137.67)	121.58	(453.33)	(480.01)	439.52
16		*Adjusted*	YYY/TON	PGa_{wh}	(1,492.65)	(952.23)	(2,345.68)	(896.87)	(570.37)	(1,185.65)	(1,190.74)	(71.88)
	Price gap at farm gate											
17		*Observed*	YYY/TON	PGo_{fg}	(834.61)	(310.95)	(1,285.55)	251.79	499.58	(200.83)	295.32	633.52
18		*Adjusted*	YYY/TON	PGa_{fg}	(1,265.65)	(743.90)	(2,002.85)	(617.42)	(316.87)	(1,067.15)	(493.41)	297.72
	Nominal rate of protection at point of competition											
19		*Observed*	%	$NRPo_{wh}$	-35.43	-17.77	-36.29	-2.54	2.45	-8.64	-6.22	6.65
20		*Adjusted*	%	$NRPa_{wh}$	-43.04	-27.18	-44.24	-14.52	-10.09	-19.83	-14.13	-1.01
	Nominal rate of protection at farm gate											
21		*Observed*	%	$NRPo_{fg}$	-32.76	-12.11	-31.75	5.27	11.67	-4.40	4.21	10.43
22		*Adjusted*	%	$NRPa_{fg}$	-42.49	-24.80	-42.03	-10.93	-6.21	-19.65	-6.32	4.64
	Nominal rate of assistance											
23		*Observed*	%	NRAo	-33	-12	-32	5	12	-4	4	10
24		*Adjusted*	%	NRAa	-42.49	-24.80	-42.03	-10.9	-6.21	-19.65	-6.32	4.64
					0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

	Decomposition of PWAfg	Unit	Symbol	2005	2006	2007	2008	2009	2010	2011	2012
25	International markets gap	YYY/TON	IRG	-	-	-	-	-	-	-	-
26	Exchange policy gap	YYY/TON	ERPG	(460.44)	(462.95)	(744.50)	(877.71)	(789.36)	(824.52)	(816.73)	(617.40)
27	Access costs gap to point of competition	YYY/TON	ACG_{wh}	51.40	62.00	82.70	118.50	97.40	92.20	106.00	106.00
28	Access costs gap to farm gate	YYY/TON	ACG_{fg}	(20.50)	(26.00)	(51.50)	(100.00)	(112.50)	(124.00)	(53.00)	(84.40)
29	Externality gap	YYY/TON	EG	-	-	-	-	-	-	-	-
	Market Development Gap	YYY/TON	MDG	(429.54)	(426.95)	(713.30)	(8559.20)	(804.46)	(856.32)	(763.73)	(595.80)
	Market Development Gap	%	MDG	(0.14)	(0.14)	(0.15)	(0.15)	(0.16)	(0.16)	(0.10)	(0.05)

	Total values	Unit	Symbol	2005	2006	2007	2008	2009	2010	2011	2012
30	**Production volume**	tons									
	Market price support										
31	*Observed*	YYY	MPSo	-	-	-	-	-	-	-	-
32	*Adjusted*	YYY	MPSa	-	-	-	-	-	-	-	-

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