



MAFAP SPAAA

Monitoring African Food and Agricultural Policies
Suivi des politiques agricoles et alimentaires en Afrique

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR WHEAT IN ETHIOPIA

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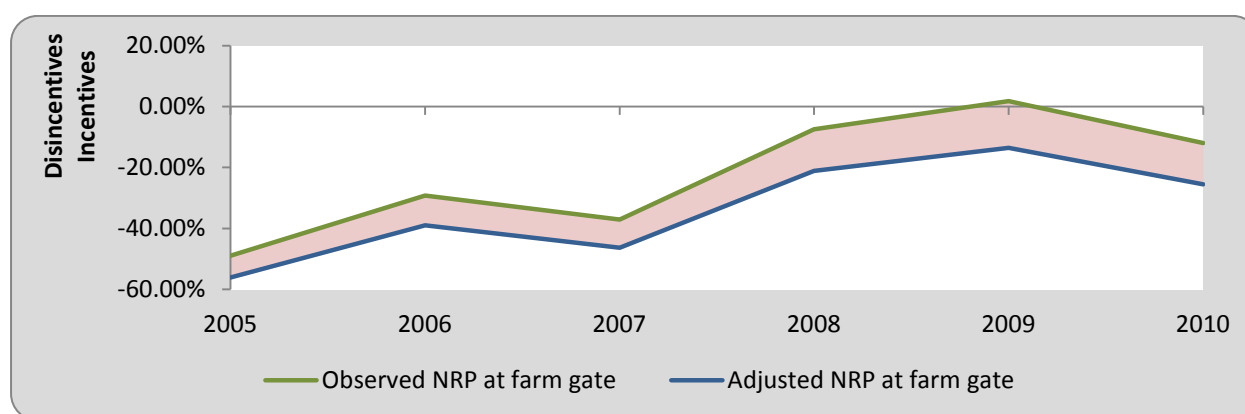
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SUMMARY OF THE NOTE

Product: Wheat
 Period analyzed: 2005 – 2010
 Trade status: Import in all years

- Wheat accounts for the fourth largest share of total cereal production.
- Ethiopia is the second largest wheat producer in sub-Saharan Africa, after South Africa
- Area under wheat cultivation expanded from 1.40 million ha in 2004/05 to 1.55 million in 2010/11
- Wheat accounted for about 13 percent of the per capita calorie intake in 2004/05.
- Wheat is the single most important staple imported from abroad
- Most of the humanitarian food aid and commercial import takes the form of wheat.
- The wheat value chain is very long and involves too many small operators.



The observed Nominal Rate of Protection (NRP, green line) and the adjusted NRP (blue line) indicate that wheat farmers were implicitly taxed and have not received price incentives under the prevailing market structure in the value chain. The adjusted NRP captures the effects of policy distortions and market inefficiencies. The area in pink shows the cost that these inefficiencies represent for producers.

- Our results show that disincentives are substantial and arise from 1) overvalued exchange rate, 2) export ban on cereals and restriction on private import (restricted access to foreign exchange), 3) distribution of imported wheat at subsidized prices, and 4) underdeveloped market structure and high transport costs.
- The level of disincentive has declined since 2007, although the trend started to reverse in 2010
- Despite the disincentives, wheat production has increased in recent years due to expansion of area under cultivation.
- Actions to be taken to reduce disincentives could include: (1) addressing currency overvaluation; (2) avoiding non-targeted distribution of grain at subsidized prices; (3) supporting the development of market structure and the grain value chain; and (4) promoting the use of bulk transport system.

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1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for wheat in Ethiopia.

For this purpose, yearly averages of 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 the reference prices and the prices along the value chain indicate to which extent incentives (positive gaps) or disincentives (negative gaps) are present at farm gate and wholesale level. In relative terms, the price gaps are expressed as Nominal Rates of Protection. These key indicators are used by MAFAP to highlight the effects of policy and market development gaps on prices.

The note starts with a brief review of the production, consumption, trade and policies affecting the commodity and then provides a detailed description of how the key components of the price analysis have been obtained. The MAFAP indicators are then calculated with these data and interpreted in the light of existing policies and market characteristics. The analysis that has been carried out is commodity and country specific and covers the period 2005-2010. The indicators have been calculated using available data from different sources for this period and are described in Chapter 3.

The outcomes of this analysis can be used by those stakeholders involved in policy-making for the food and agricultural sector. They can also serve as input for evidence-based policy dialogue at country or regional level.

This technical note is not to be interpreted as an analysis of the value chain or detailed description of production, consumption or trade patterns. 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 is preliminary and still subject to review and validation.

2. POLICY CONTEXT

Ethiopia is the second largest wheat producer in sub-Saharan Africa, after South Africa. Although most of the wheat grown in Ethiopia is bread wheat, there is some durum wheat which is often grown mixed with bread wheat.

Wheat is among the most important crops in Ethiopia, ranking fourth in total cereals production (16 per cent) next to maize, sorghum and teff (CSA, 2009). It is grown as a staple food in the highlands at altitudes ranging from 1500 to 3000 masl. Nearly all wheat in country is produced under rain-fed conditions predominantly by small farmers. A few government owned large-scale (state) farms and commercial farms also produce wheat. Despite the recent expansion, Ethiopia falls short of being self-sufficient in wheat production, and is currently a net importer of wheat grain.

Production

Wheat ranks fourth in terms of area production and yield among food crops (Table 1). Production of wheat increased from 2.2 (000 T) in 2004/2005 (CSA, 1998) to 2.8 (000 t) in 2010/2011 (CSA, 2000) an increase of 31 per cent. However, the share of wheat in total cereal area decreased (-12.4 percent) over the same period, mainly due to a shift in cropping patterns towards sorghum (Table 1). Wheat yield in Ethiopia is also lagging behind other major producers in Africa: average yield was 1.68 t ha⁻¹ during the same period, about 32 per cent and 39 per cent below Kenyan and South African averages, respectively (FAOSTAT). The apparent low productivity can be attributed to several factors, including slow progress in developing wheat cultivars with durable resistance to diseases, and depleted soil fertility.

Table 1: Cereals area, production, yield and annual change (smallholder farms, Meher season), 2004/05-2010/11

	2004/2005				2010/2011				Expansion rate			
	Area 000 ha	Prod uction 000 tonnes	Yield (ton nes/ ha)	Shar e in Total Cere als Area (%)	Area 000 ha	Produ ction 000 tonnes	Yield (tonne s/ha)	Share in Total Cereal s Area (%)	Area 000 ha	Produ ction 000 tonnes	Yield (Tonnes/ha)	Share in Total Cereals Area (%)
Grain	9811	1190			11823	20349			20.5	70.9		
Cereals	7638	1003			9691	17761			26.9	77.1		
<i>Teff</i>	2136	2026	0.95	28.0	2761	3483	1.26	28.5	29.3	72.0	33.0	1.9
<i>Barley</i>	1095	1328	1.21	14.3	1047	1703	1.63	10.8	-4.5	28.3	34.2	-24.7
<i>Wheat</i>	1398	2177	1.56	18.3	1553	2856	1.84	16.0	11.1	31.2	18.1	-12.4
<i>Maize</i>	1393	2394	1.72	18.2	1963	4986	2.54	20.3	40.9	108.3	47.8	11.1
<i>Sorghum</i>	1254	1716	1.37	16.4	1898	3960	2.09	19.6	51.4	130.8	52.4	19.3
<i>Finger millet</i>	313	333	1.06	4.1	408	635	1.56	4.2	30.4	90.8	46.3	2.8
<i>Oats / 'Aja'</i>	45	57	1.26	0.6	31	48	1.54	0.3	-31.6	-16.1	22.7	-46.1
<i>Rice</i>	-	-	-	-	30	90	3.03	0.3	-	-	-	-

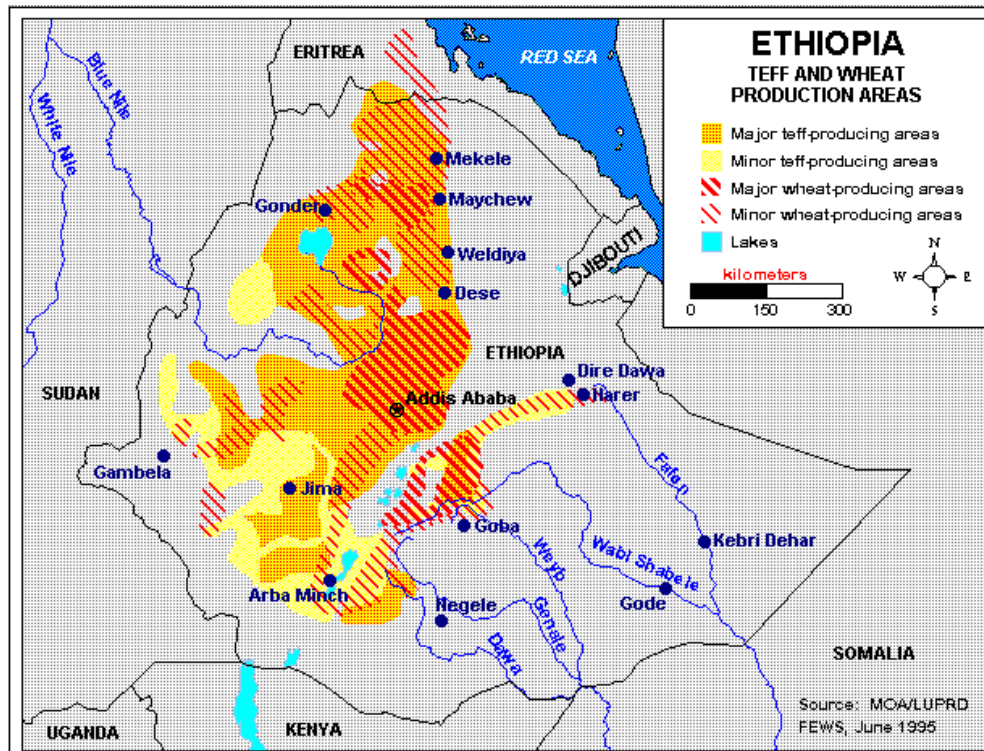
Source: Author's computation using CSA data

*Total Area cultivated and total production include: Grain, Vegetables, root crops, Fruit crops, Chat, Coffee and Hops

Climatic characterization of the existing wheat zone indicated that precipitation and minimum temperature during the three consecutive wettest months were the key determinants of potential

wheat areas. However, agricultural production patterns vary markedly across Ethiopia according to agro-climatic conditions. As Figure 2 shows, the main wheat growing areas of Ethiopia are the highlands of the northern, central and south-eastern parts of the country.

Figure 2: Ethiopia wheat production area



Source: USDA 2002

The largest volume of the main season production of wheat originates from Oromia (55 per cent), Amhara (29 per cent) and the Southern Nations, Nationalities, and Peoples Region, SNNPR (9 per cent). Table 2 summarizes wheat area, production and yields in the three main wheat growing regions in the year 2010/2011 (CSA, 2010).

Table 2: Wheat area, production and yield by Regions and Zones (2010-11)

	Number of holders	Area (ha)	Production (tonne)	Yield (tonne/ha)	Share of total production (%)
Ethiopia	4'591'729	1'553'240	2'855'682	1.8	
Oromia region	1'843'956	815'976	1'583'212	1.9	55.4
<i>Arsi</i>	302'897	199'853	438'551	2.2	15.4
<i>West Arsi</i>	150'078	109'439	234'833	2.1	8.2
<i>Bale</i>	150'763	118'833	275'577	2.3	9.7
<i>West Shewa</i>	178'458	57'426	104'876	1.8	3.7
<i>East Shewa</i>	112'544	55'035	97'816	1.8	3.4
<i>South West Shewa</i>	164'868	65'386	128'182	2.0	4.5
Amhara Region	1'617'509	498'749	824'860	1.7	28.9
<i>North Shewa</i>	195'546	73'362	129'367	1.8	4.5
S.N.N.P. Region	718'180	131'163	244'602	1.9	8.6

Source: Author's calculation based on CSA 2010/2011 data

Consumption

In Ethiopia, wheat grain is used in the preparation of a range of products such as: the traditional staple pancake ("injera"), bread ("dabo"), local beer ("tella"), and several others local food items (i.e., "dabokolo", "ganfo", "kinche"). Besides, wheat straw is commonly used as a roof thatching material, and as a feed for animals. Wheat contributes approximately 200 kcal/day in urban areas, compared to about 310 kcal in rural areas (Table 3). It accounts for about 11% of the national calorie intake.

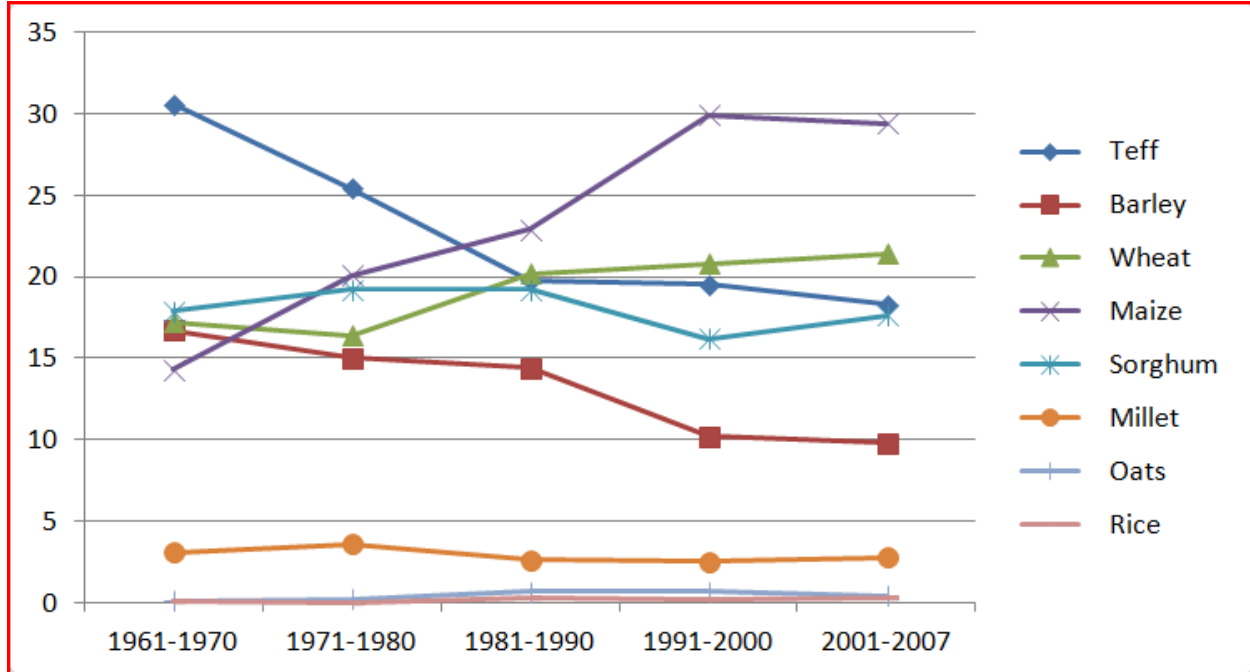
Table 3: Rural vs. urban per capita calorie consumption of food items (2004/05)

Food item	Per capita calories			% of national
	Urban	Rural	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
Oil & fat	145.18	31.91	47.98	2.06
Vegetables & fruits	60.78	59.43	59.62	2.56
Pepper	6.89	3.57	4.04	0.17
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
Other-foods	96.47	103.28	102.31	4.39
Total (National)	1987.96	2386.46	2329.94	100.00

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

The share of wheat in total cereal consumption has increased, from about 16 percent in 1971-1980 to about 22 percent in 2001-2007 (Figure 3). The shift wheat is likely to have been influenced by a growing consumption of bread in urban areas and food aid (mainly in the form of wheat) in vulnerable areas.

Figure 3: Consumption trends of major staples in the total cereal consumption (%)



Source: Author's elaboration based on FAOSTAT data

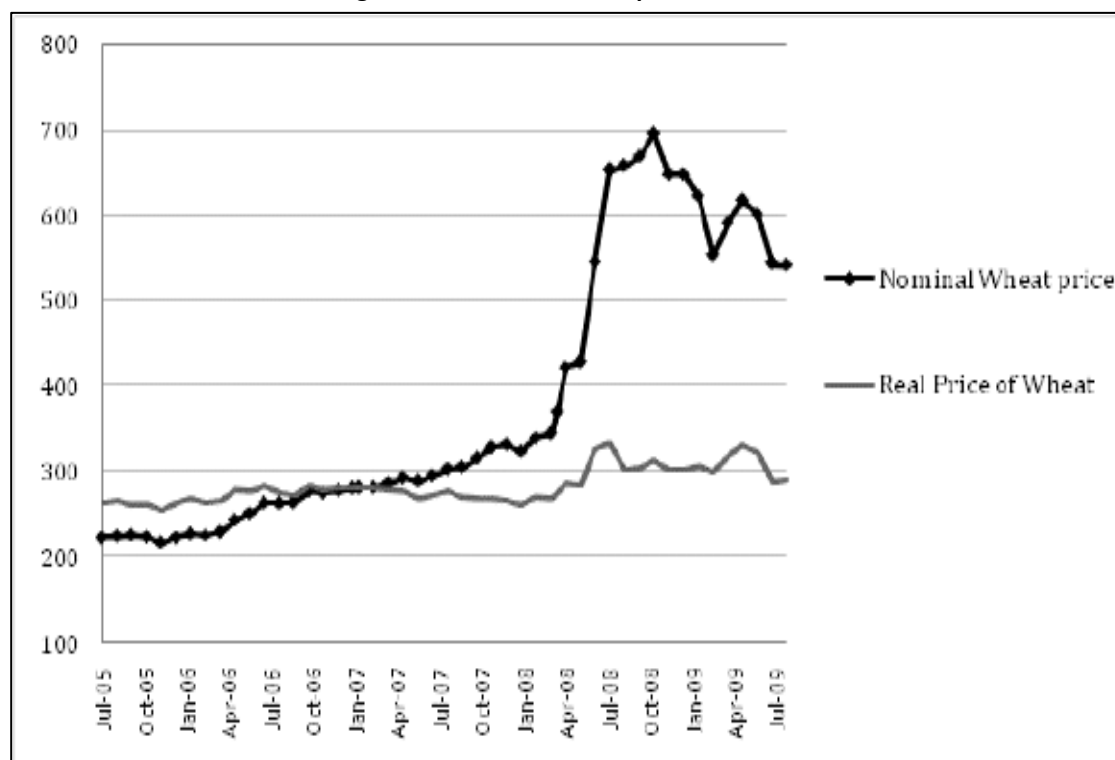
Marketing and Trade

Following the grain market liberalization policy in 1991, the business environment changed completely leading to wider private-sector participation in the grain trading and reportedly an improvement in the efficiency of grain marketing. Nevertheless, Ethiopian grain markets remain poorly integrated and are characterized by significant price volatility (Negassa and Jayne, 1997). Only 28 percent of total cereals production reaches the market, suggesting considerable scope for expanding the volume of the grain market¹.

Monthly retail prices of wheat for the period 2005 to 2009 show a steadily increasing trend until the beginning of 2008, when prices reached their maximum levels (Figure 5). 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 the gap between nominal and real price remained wide though wheat price declined by almost a quarter but far above its original levels. Compared to mid-2007, the real price of wheat in mid-2009 was only 7 per cent higher. Real and nominal prices have also tended to fluctuate since 2007, rising sharply in 2008 and falling significantly in 2009. Prices have risen and fallen in 2010 to 2012, according to GIEWS price data base.

¹ Gabre-Madhin, Eleni Z. 2001.

Figure 5: Nominal and real price of wheat



Source: Rashid 2010

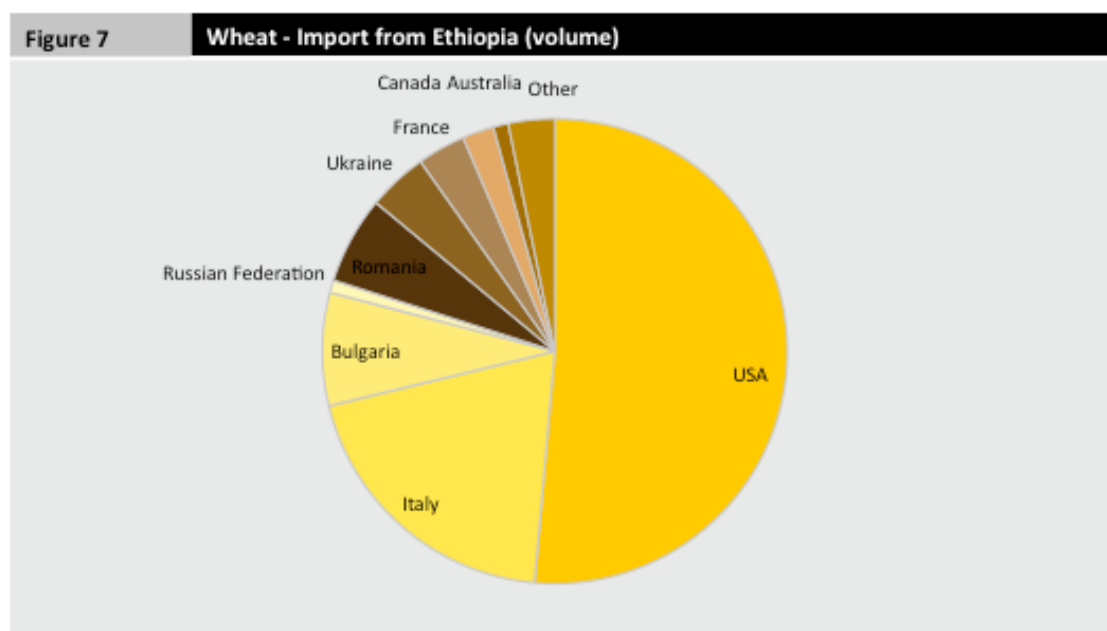
On average, wheat production was about 1.6 million tonnes in the period 2000-2005, compared to the local demand of about 2.2 million tonnes, thus creating an annual deficit of roughly 0.7 million tonnes. The level of wheat import is significant but it is largely made up of food aid rather than competitive import. In the period 2000-2006, much of the food deficit was covered through food aid, accounting for about 85 percent of total wheat import (FAOSTAT, 2011). Nevertheless, the country on average has imported (commercially) slightly less than 1 million metric tonnes of wheat per year in recent years (Table 3).

Table 3: Wheat trade in Ethiopia (2005-2010)

Wheat	2005	2006	2007	2008	2009	2010
Import Qt (T)	862'145	328'306	384'127	1'100'050	1'111'522	1'048'706
Export Qt (T)	195	-	1	359	1	5
Net trade	-861'950	-	-384'126	-1'099'691	-1'111'521	-1'048'701
Import (1 000 USD)	224'796	83'786	134'034	465'194	321'619	304'281
Export (1000 USD)	29	-	1	124	1	5
Net trade (1 000USD)	-224'767	-	-134'033	-465'070	-321'618	-304'276
Implicit value exports (USD/T)	150	-	583	347	2945	962
Implicit value imports (USD/T)	261	255	349	423	289	290

Source: Author's elaboration based on UNCOMTRADE data

USA is currently the largest supplier of wheat to Ethiopia, accounting for about 51 percent of total import (2005-10) while Italy and Bulgaria accounting for 20 and 8 percent of total import, respectively (Figure 7). All the remaining countries cover less of 20 percent of the overall wheat import.



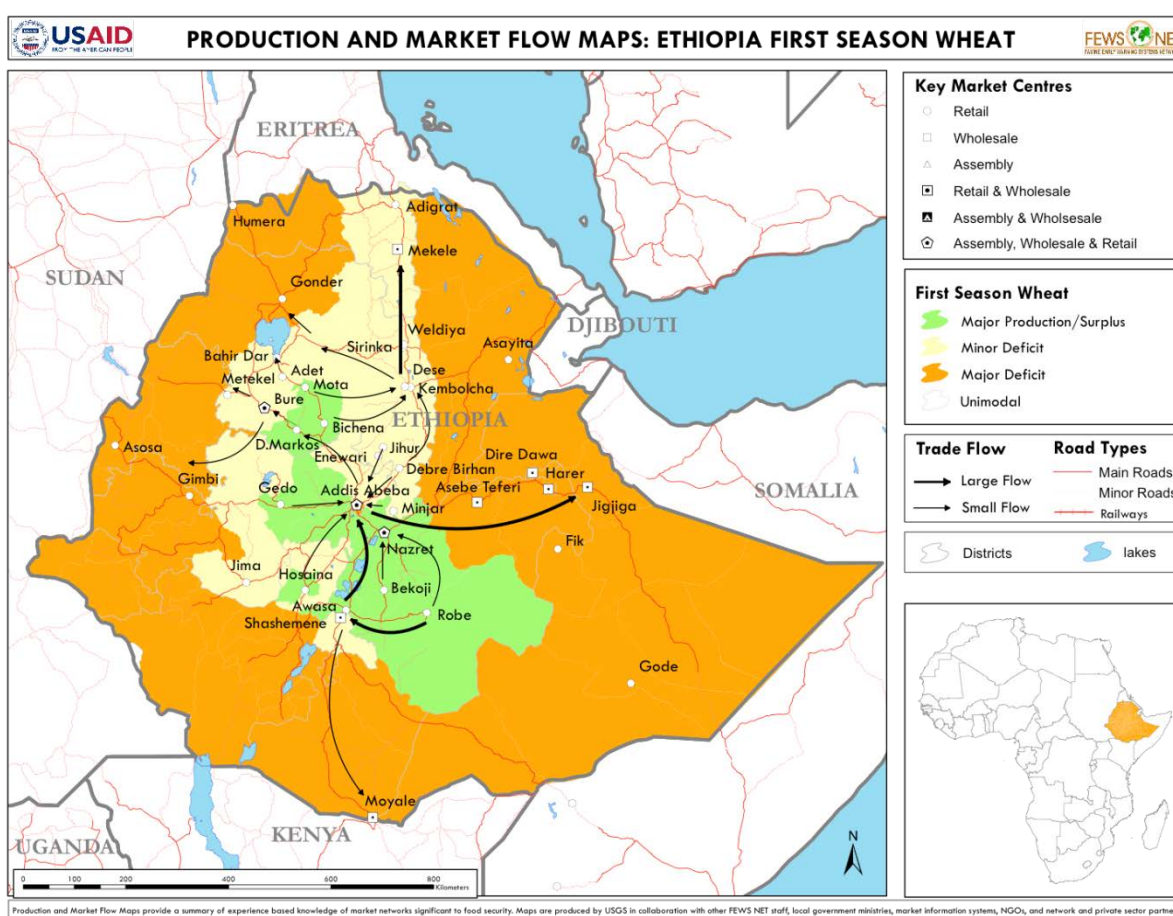
Source: Author's elaboration based on UNCOMTRADE data

Description of the Value Chain and Processing

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

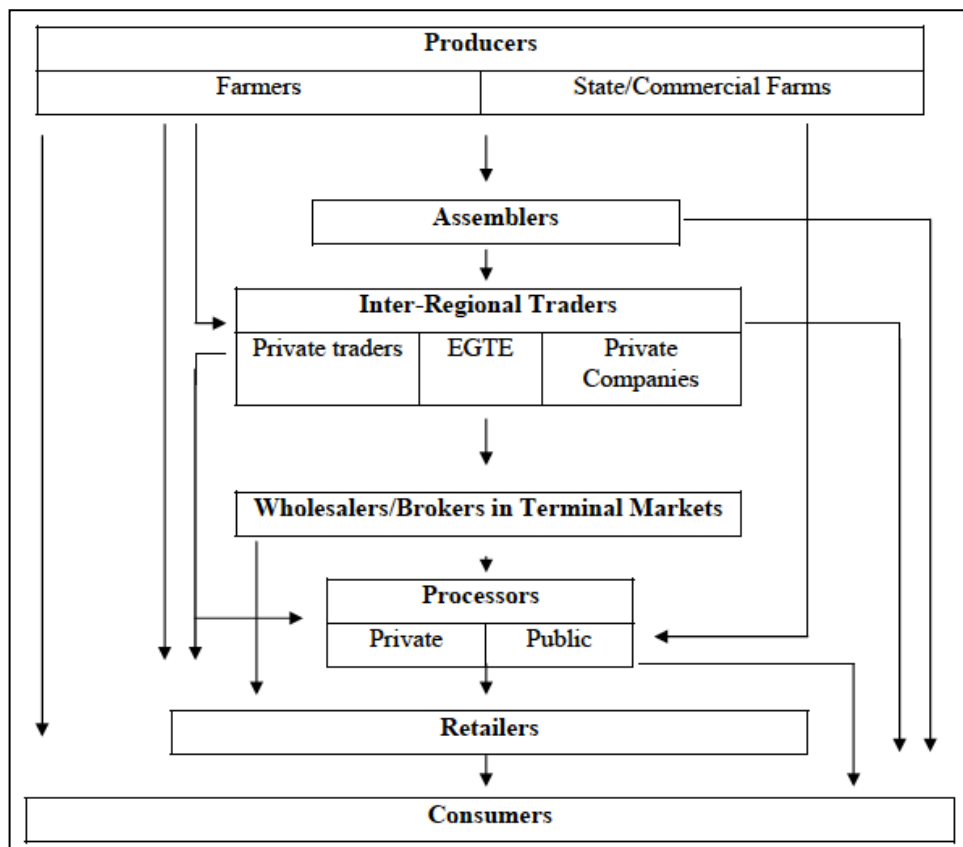
As shown in Figure 8, the market chain flows from the major surplus area, namely Bale, Arssi, Kembata, and Eastern Shoa to deficit areas and Addis Ababa. The trade flow involves rural assemblers and regional wholesalers retailers, part-time farmer-traders, brokers, agents, assemblers, processors, cooperatives, the Ethiopian Grain Trade Enterprise (EGTE), and consumers (Figure 9).

Figure 8: Production and market flow maps, Ethiopia first season wheat



Source: FEWSNET

Figure 9: Grain market value chain



Source: Walker and Wandschneider, 2005.

The main actors in the value chain are smallholder farmers who tend to sell large quantities of their production during and soon after the main (meher) harvest, 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 assemblers².

Brokers at the Addis Ababa central market have the task of checking the grain quality, determine the market-clearing price, and then sell it 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 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 and consumers and the local traders.

By contrast in surplus areas, the main participants 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.

² Usually larger-scale farmers who operate independently and who assemble grain from many sources to directly reselling it to consumers or sometimes acting as agents for wholesalers on a fixed-fee or commission basis. See Walker and Wandschneider, 2005.

Policy Decisions and Measures

Following the overthrow of the former military Government and the introduction of policy reforms in 1992, the market for wheat, 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 sellers can come together to trade. The Exchange has plans to expand its operation from export crops (coffee, sesame and haricot beans) to food crops, including wheat, in the near future.

There is a relatively strong wheat research program in Ethiopia. In particular, the Ethiopian Institute of Agricultural Research has a long history of wheat breeding program. Several varieties have been disseminated to farmers since the inception of wheat research. However, a substantial gap exists between yields on research fields and on farmers' fields. 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 the rust diseases, as resistant varieties become susceptible to new rust races³.

The Agricultural Transformation Agency (ATA) has been established (2010) to enhance productivity and production of smallholder farmers and pastoralists as part of the current Five year (2011-15) Growth and Transformation Plan (GTP). The primary aim is to promote agricultural sector transformation by supporting existing structures of government. The Agency has identified its priority crops and wheat is one of the eight commodities identified (the others are teff, maize, barley, pulses, oilseeds, rice and livestock) for special support.

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

As already noted, despite the increase in production, the quantity of wheat import remains high. However, wheat import data for Ethiopia includes food aid, which averaged more than half a million tons in 2008 (Rashid, 2010). Ethiopia is one of the largest recipient of food aid in Africa, receiving 27% of the global food aid to sub-Saharan Africa (Bezu and Holden, 2008)⁴. Government wheat import (through EGTE) has also increased significantly in response to the 2008 high food prices. Wheat imported by the government is sold to poor consumers in urban areas at subsidized prices.

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

³ See for instance: <http://www.cimmyt.org/en/newsletter/511-2011/1008-resistant-wheats-and-ethiopian-farmers-battle-deadly-fungus>

⁴ Bezu, S and Holden, S. (2008) "Can food-for-work encourage agricultural production?", Food Policy 33(6) : 541-549.

Some authors have highlighted that large quantities of food aid, if poorly targeted, could depress market prices and reduce the incentive to increase production (Jayne and Molla 1995; Molla et al.1997). Bezu and Holden (2008) showed that food for work relieved liquidity constraint in one of the most vulnerable areas of Ethiopia (Tigray) and thereby encouraged adoption of fertilizer. On the other hand, a more 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% increase in annual per capita food aid reduces monthly price by as much as 5% and the impact is slightly stronger for a market in major surplus producing area (Markos) (Tadesse and Shively, 2009)⁵. Combined with the sale of imported public stock at subsidized price, the disincentive impact on producers can be substantial. The problem is particularly serious when food is poorly targeted or when food aid distribution is not related local production situations⁶.

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 (Birr) 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 Birr by 25 percent in September 2010 (Rashid, 2010)⁷. Another study (Dorosh, et al., 2009)⁸, showed that real exchange rate appreciated by 9.7, 12.8, 14.9 and 33.8, 26.3 percent in July 2005, July 2006, July 2007, July 2008 and June 2009, respectively. High rate of inflation (relative to the low inflation rate among its trading partners) and increasing pressure on foreign exchange reserve are among the major cause 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 2007 and 2008, the foreign currency reserve fell short of the critical requirement of 12 weeks worth of imports and the Government instituted foreign exchange rationing (Rashid, 2010). In March 2008, access to foreign exchange for imports was restricted (rationed) to curb excessive drawdown of foreign exchange reserve. It is assumed that the local currency was, on average, 20 percent overvalued during the period 2005- 2010 and the exchange rate has been adjusted accordingly in our calculation of adjusted reference prices. The adjustment factor approximates the depreciation of the local currency had a more liberal policy been pursued.

⁵ 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.

⁶ For instance, Nunn and Qian (2011) found that the amount of food aid shipment 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

⁷ 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.

⁸ Dorosh P, S. Robinson and H. Ahmed (2009), Economic Implications of Foreign Exchange Rationing in Ethiopia, IFPRI/EDRI ESSP2 Discussion Paper 009.

3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

Trade status of wheat

Though Ethiopia used to be a net exporter of wheat (Gorfu et al., 1996), low and declining level of production and productivity transformed the country into a net importer of wheat. Furthermore, the rapidly increasing population in conjunction with changing consumption pattern did not allow the country to meet the growing demand for food. As a result, the level of wheat self-sufficiency at the national level in Ethiopia is estimated at only 55 per cent, necessitating importation to fill the gap.

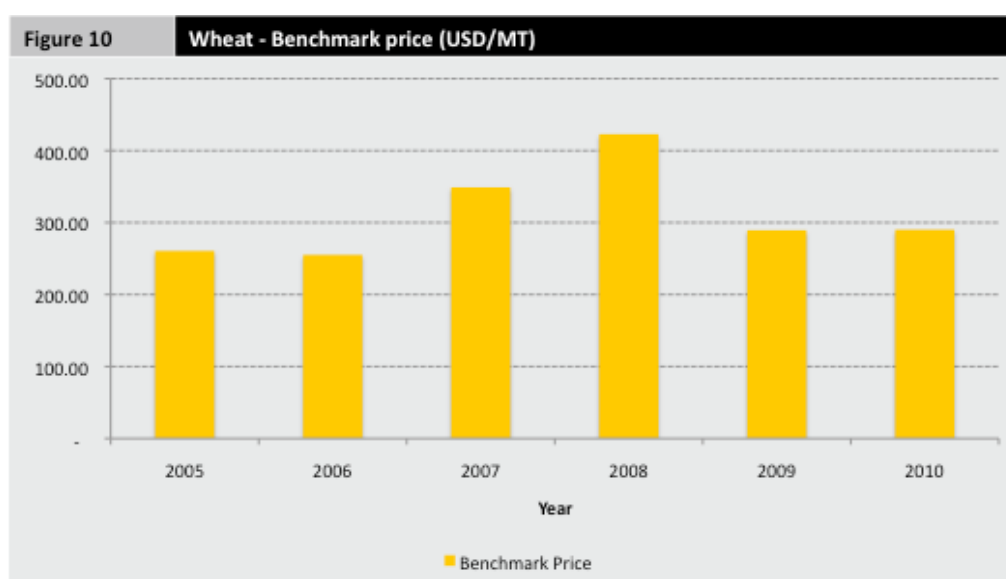
Benchmark prices

Benchmark prices are CIF prices at the Djibouti port. These figures are derived from UN Comtrade and represent the world unit value calculated as the share of total value on total volume for a given year. Consistent with international prices, wheat CIF prices have increased since 2007 though the level of price has fallen in recent years (Figure 10). Though US is the main supplier of wheat accounting for more than half of the total Ethiopian's grain imports, the implicit CIF price, appear relatively high compared to the world average prices (table 4), that is why we used the world CIF prices as benchmark price.

Table 4: Average annual CIF import prices for wheat in Ethiopia (USD/tonne)

	Source	2005	2006	2007	2008	2009	2010
USA CIF	UN comtrade	263	302	416	557	406	342
World CIF	UN comtrade	261	255	349	423	289	290

Source: Author's calculation based on UN Comtrade data



Source: Author's elaboration based on UNComtrade data

DOMESTIC PRICES

Observed

Domestic prices refer to both price at the point of competition and the farm gate price. Domestic price at the point of competition represent the price at the wholesale market where the domestic wheat produced competes with the imported wheat. In Ethiopia, the EGTE collects prices for Addis Ababa, which is considered the main central market, and several major markets in the country⁹. Addis Abeba is also considered the main point of competition for other main producing areas.

The average annual wholesale price of mixed wheat in Addis Ababa is considered as the wholesale price at the point of competition. As a proxy for farm gate price we used the wholesale price of white wheat in the rural market of Hossana.¹⁰ The Hossana price has been corrected for the price differences between mixed (generally fetches lower price) and white wheat (higher prices). On average, mixed wheat prices in Shashemene (one of the production area markets with both mixed and white wheat prices) is about 14 percent lower, hence the Hossana white wheat price has been reduced by 14% to arrive at mixed wheat price.

The second correction concerns the conversion of the Hossana wholesale to farm gate prices. Regional traders offer a lower price to farmers and assemblers in and around the Hossana market with the aim of either selling at a wholesale price in the Hossana market or transporting to Addis to sell at wholesale price in Addis Ababa. Their gross margin when selling in Hossana (at wholesale price) is assumed to be half of the estimated net margin obtained by selling in Addis. Therefore, we deducted this gross margin from the observed wholesale price in Hossana to arrive at the corresponding farm gate price (Table 5).

⁹ Monthly wholesale price data of major cereals, pulses and oilseeds are posted in EGTE's website (<http://egtemis.com/marketstat.asp>).

¹⁰ Located at about 232 km south west of Addis, Hossana (Hosaena) represents one of the major wheat producing areas of Ethiopia. Assela is also located in one of the major wheat producing areas but there are no price data for Assela market. Nevertheless, traders in Addis were able to provide trading costs for Assela and these have been used to estimate marketing and transport costs for Hossana.

Table 5: Observed wholesale and farm gate price mixed wheat

	Source	2005	2006	2007	2008	2009	2010
Wholesale purchase price observed at the market of A.A. (mixed wheat)	ETB/tonne	1,798	2,406	2,657	4,300	4,100	4,917
Hossana wholesale observed price (-14% adj mixed)	ETB/tonne	1,471	1,951	2,376	4,347	4,100	3,777
50% estimated gross margins (deducted)	ETB/tonne	175	175	175	150	150	125
Hossana farm gate observed price	ETB/tonne	1,296	1,776	2,201	4,197	3,950	3,652

Source: Ethiopian Grain Trade Enterprise (EGTE), <http://eqtemis.com/priceone.asp>

As Table 5 shows, the Hossana wholesale price for the year 2008 is higher than the corresponding price in Addis Ababa. As shown above, a reasonable explanation of such incongruence can be found in the policy pursued following the high food crisis of 2007-08 when the government imported a large quantity of wheat for sale at fixed prices in the domestic market (generally 300 Birr/quintal or only about half of the wholesale price of wheat in Addis Ababa market). Dorosh and Ahmed (2009) reported that most of the imported wheat (55 percent) was sold to flour mills, 23 percent to consumers and 18 percent to cooperatives while less than 2 percent (8,100 tonnes) was sold to traders. No wheat was sold to traders after September 2008, due to concerns that traders did not pass on the implicit subsidy to consumers. The distribution of wheat mainly took place in Addis Ababa, which can partially explain the small gap between the wholesale and farm gate prices.

Access costs

From port to point of competition

Access cost from port to the point of competition (Addis Ababa) includes surtax and withholding tax, port handling, transport, unloading and miscellaneous costs (5 per cent of CIF). The cost estimates are based on a recent USAID Bellmon study (USAID, 2010). Among the major costs are port transport and port handling costs. Transport costs have increased but not by as much as the inflation in the country or fuel price increases in the international market (Table 6). Access costs obtained from major grain traders and trader associations are broadly consistent with the USAID cost estimates.

Since transport cost used in this analysis is less than 6 US cents per ton per km (which is considered as reasonable by African standards¹¹, though not by the government¹²), no adjustment is made in

¹¹ Transport prices in Africa are, on average, higher than in South Asia or Brazil. In 2007, prices (per ton-kilometer (tkm)) on the Central African Douala–N'Djame'na route (linking Cameroon with Chad) are more than three times higher (11 US cents/ per tonne/km) than in Brazil (3.5 cents per tonne per km) and more than five times higher than in Pakistan (2 cents per tonne per km). Only the Durban–Lusaka corridor (6 cents per tonne per km) in Southern Africa approaches the price level of other regions of the world. Our observed cost varied between 4.5 and 4.8 cents, which is not too high, given the inefficiency and long delays at the points of loading and unloading, the recent high cost of fuel, and poor road conditions, among other factors. See for instance, Teravaninthorn, S. and Gaël Raballand, Transport Prices and Costs in Africa: A Review of the Main International Corridors, Africa Infrastructure Country Diagnostic (AICD), Working Paper 14, July 2008, (http://www.infrastructureafrica.org/system/files/WP14_Transportprices.pdf).

the observed transportation cost from port to point of competition. It should be noted that the margin/ profit for importers is included in the miscellaneous (5% of CIF). Surtax and withholding tax has been deducted from the observed total cost to arrive at the adjusted access cost from port to point of competition.

Table 6: Access costs from Djibouti to Addis Ababa

		2005	2006	2007	2008	2009	2010
Surtax & Withholding tax	ETB/quintal	5.14	6.20	8.27	11.85	9.74	9.22
Port Handling	ETB/quintal	23.30	23.30	23.30	23.30	23.30	23.30
Transport costs	ETB/quintal	38.00	38.00	38.67	43.75	52.75	57.00
Unloading	ETB/quintal	3.20	3.20	3.20	3.20	3.20	3.20
Miscellaneous (5% of CIF)	ETB/quintal					16.23	
		8.57	10.34	13.79	19.76		15.37
Total costs	ETB/quintal	78.21	81.04	87.22	101.86	105.22	108.08
Total costs - observed	ETB/tonne	782	810	872	1,019	1,052	1,081
Total costs – adjusted (less surtax and withholding tax)							
	ETB/tonne	731	748	790	900	955	989

Source: USAID, USAID Office of Food For Peace Ethiopia, Bellmon Estimation, Annex 1 Economic Data and Trends, September 2011.

From farm to point of competition

Marketing costs from Hossana to Addis are based on information on Assela gathered from group discussion with traders/ brokers and trader associations at the Addis Ababa central grain market, and include costs such as loading, transport, fees for brokers of truck, unloading, storage, losses, fees for brokers selling wheat in Addis and margins for traders (Table 7).

Transport costs represent the most significant component of the total access costs. Table 7 shows transport cost from Hossana to Addis Ababa. Transport costs per kg per tonne for Assela to Addis Ababa are used to calculate the observed transport cost for Hossana to Addis Ababa. There is a trend toward increased transportation costs, which have more than doubled between 2005 and 2010, mainly because of the high fuel cost and high rate of inflation in the country. On average the observed transport costs are 30 percent higher than those reported along the Djibouti – Addis Ababa stretch of road. The high cost is also related to the use of smaller trucks (often less than 10 tonnes capacity) rather than bigger trucks with lower costs per unit.

Estimated margins¹³ are relatively high but have tended to decline between 2005 and 2010. Traders have also indicated that profits as a proportion of sales value have declined. One recent study also

¹² A recent government report indicated that the price/tonne/km of transporting commodities via the Djibouti corridor is very high compared to other countries: the price/tonne/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. See for instance, The Reporter (newspaper), 11 February, 2012: <http://www.thereporterethiopia.com/News/govt-to-tighten-grip-on-trade-logistics.htm>

¹³ Traders believe that actual profit margins are not well known as purchase prices vary by the day and so is the sales price.

found that net margins declined significantly in 2008 compared to 1996 and 2002 (Rashid and Negassa, 2011). One possible reason is that prices are already too high and traders find it difficult to increase their margins. It is also possible that trade has become more competitive and margins have been squeezed. Traders have also indicated that profits decline with soaring prices as most customers cut back on their purchases. Profits increased sharply in 2010 but it appears that trade margins have not increased in proportion with increase in prices.

Table 7: Observed access costs Hossana to Addis Ababa (nominal prices)

	Unit	2005	2006	2007	2008	2009	2010
Loading	ETB/tonne	10	13	15	30	30	40
Transportation costs	ETB/ tonne	133	146	199	252	292	331
Broker fees for truck - per ton	ETB/ tonne	3	12	8	28	24	20
Brokers's fee for selling grain in Addis	ETB/ tonne	10	10	15	20	25	30
Estimated margins for traders	ETB/ tonne	350	350	350	300	300	250
Total costs	ETB/ tonne	506	531	587	630	671	671

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

Adjusted transport cost is obtained by reducing the observed transport cost by 10 to 30 percent (Table 8). The adjustment is intended to reduce transport cost to between 6.1 and 7.4 US cents/km/tonne, which is slightly higher than the rates charged along the Djibouti – Addis Ababa road.¹⁴

¹⁴ A recent government 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. See for instance, The Reporter (newspaper), 11 February, 2012: <http://www.thereporterethiopia.com/News/govt-to-tighten-grip-on-trade-logistics.html>.

Table 8: Adjusted transportation costs and adjusted access cost (Hossana to Addis Ababa)

		2005	2006	2007	2008	2009	2010
Observed transportation costs Addis Ababa - Hossana	ETB/tonne	133	146	199	252	292	331
Transportation costs Addis Ababa - Hossana	ETB/tonne/km	0.57	0.63	0.86	1.09	1.26	1.43
Exchange rate	ETB/USD	8.67	8.74	9.21	9.80	12.10	12.89
Transportation costs Addis Ababa - Hossana	USD/tonne/km	0.07	0.07	0.09	0.11	0.10	0.11
Adjustment in % required to reduce transport cost (to between 6.1-7.4 US cents/km/tonne)		10%	10%	20%	30%	30%	30%
Excess transport cost to be deducted from observed cost		13.3	14.6	39.8	75.6	87.6	99.3
Adjusted transportation costs Addis Ababa - Hossana (232)	ETB/tonne	119	131	159	176	204	232
Adjusted access cost (Addis Ababa – Hossana)	ETB/tonne	492.31	516.75	547.09	554.32	583.16	572.00

Source: Author's calculation based on information collected from traders

EXCHANGE RATES

The official exchange rate is used to calculate the observed benchmark prices. However, the rate is not determined by market forces, independently of any government interventions. It is characterized as managed floating with strong government control. High rate of inflation (relative to the low inflation rate among its trading partners) and increasing pressure on foreign exchange reserve are among the major cause of currency appreciation in Ethiopia. Between 2005 and 2008, inflation rates hit double digits and then declined to 8.5 and 7 per cent in 2009 and 2010, respectively. In 2007 and 2008, the foreign currency reserve fell short of the critical requirement of 12 weeks worth of imports and the government instituted foreign exchange rationing (Rashid, 2010). In March 2008, access to foreign exchange for imports was restricted (rationed) to curb excessive drawdown of foreign exchange reserve.

It is assumed that the local currency was, on average, 20 per cent overvalued during the period 2005- 2010 (Rashid, 2010)¹⁵ and the exchange rate has been adjusted accordingly in our calculation of adjusted reference prices. Table 9 reports the exchange rate as reported by the National Bank of Ethiopia (observed) and adjusted rates.

¹⁵ 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.

Table 9: Nominal exchange rate ETB/USD

Nominal Exchange Rate	2005	2006	2007	2008	2009	2010
Observed	8.67	8.74	9.21	9.80	12.10	12.89
Adjusted	10.40	10.49	11.05	11.76	14.52	15.47

Source: NBE and author's calculation

EXTERNALITIES

No externalities are taken into consideration at this stage of the analysis.

BUDGET AND OTHER TRANSFERS

There are no fertilizer subsidies in Ethiopia as the government removed input subsidy in 1997.

QUALITY AND QUANTITY ADJUSTMENTS

No indications of significant quality differences between domestic or foreign produce have been found. Therefore no adjustments are applied in our analysis.

Summary table for data description in MAFAP technical notes

Following the discussions above, here is a summary of the main sources and methodological decisions taken for the analysis of price incentives and disincentives for wheat in Ethiopia.

		<i>Description</i>	
<i>Concept</i>		<i>Observed</i>	<i>Adjusted</i>
Benchmark price		<i>CIF price calculated as unit value from import data reported in COMTRADE from main origin of imports (see Table 4)</i>	N.A.
Domestic price at point of competition		<i>Annual average of wholesale price in Addis Ababa market as reported by Ethiopia Grain Trade Enterprise (see Table 5)</i>	
Domestic price at farm gate		<i>Annual average of wholesale price in main producing area (Hossana, Southern Ethiopia) as reported by Ethiopia Grain Trade Enterprise (see Table 5)</i>	<i>Adjustment has been made to calculate the mixed wheat prices by using the price differences between white and mixed wheat in Shashemene As farm gate price we used the wholesale price in the market of Hossana, minus estimated wholesalers' margin.</i>
Exchange rate		<i>Annual average of exchange rate as reported by National Bank of Ethiopia (see Table 9)</i>	<i>Observed increased by 20 per cent assuming an overvaluation as reported by Rashid (2010) (see Table 9)</i>
Access cost to point of competition		<i>As reported in USAID, USAID Office of Food For Peace Ethiopia, Bellmon Estimation, Annex 1 Economic Data and Trends, September 2011. (see Table 6)</i>	<i>Transportation costs adjustment to reduce transport cost to 6.1-7.4 US cents/km/tonne (see Table 8)</i>
Access costs to farm gate		<i>Loading, Transportation costs, Broker fees for truck - per tonne, Broker's fees, trader's margin as estimated by a group of traders in the Addis Ababa wholesale market</i>	N.A.
QT adjustment	Bor-Wh	N.A.	N.A.
	Wh-FG	N.A.	N.A.
QL adjustment	Bor-Wh	N.A.	N.A.
	Wh-FG	N.A.	N.A.

The data used for the analysis is summarized in the following table:

		Year	2005	2006	2007	2008	2009	2010
		trade status	<i>m</i>	<i>m</i>	<i>m</i>	<i>m</i>	<i>m</i>	<i>m</i>
DATA	<i>Unit</i>	<i>Symbol</i>						
Benchmark Price								
<i>Observed</i>	USD/TON	$P_{b(intD)}$	260.74	255.21	348.93	422.88	289.35	290.15
<i>Adjusted</i>	USD/TON	P_{ba}						
Exchange Rate								
<i>Observed</i>	ETB/TON	ER_o	8.67	8.74	9.21	9.80	12.10	12.89
<i>Adjusted</i>	ETB/TON	ER_a	10.40	10.49	11.05	11.76	14.52	15.47
Access costs border - point of competition								
<i>Observed</i>	ETB/TON	ACO_{wh}	782.07	810.40	872.23	1'018.58	1'052.20	1'080.83
<i>Adjusted</i>	ETB/TON	ACa_{wh}	730.68	748.37	789.52	900.05	954.81	988.65
Domestic price at point of competition	ETB/TON	P_{dwh}	1'797.92	2'405.90	2'656.94	4'300.00	4'100.00	4'916.67
Access costs point of competition - farm gate								
<i>Observed</i>	ETB/TON	ACO_{fg}	505.57	531.33	586.86	629.89	670.66	671.43
<i>Adjusted</i>	ETB/TON	ACa_{fg}	492.31	516.75	547.09	554.32	583.16	572.00
Farm gate price	ETB/TON	P_{dfg}	1'296.34	1'776.41	2'201.00	4'196.85	3'949.85	3'652.05
Externalities associated with production	ETB/TON	<i>E</i>	1.00	1.00	1.00	1.00	1.00	1.00
Budget and other product related transfers	ETB/TON	<i>BOT</i>	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
Quality conversion factor (border - point of competition)	Fraction	QL_{wh}	1.00	1.00	1.00	1.00	1.00	1.00

CALCULATION OF INDICATORS

The indicators and the calculation methodology used is described in Box 1. A detailed description of the calculations and data requirements is available on the MAFAP website or by clicking [here](#).

Box 1: MAFAP POLICY INDICATORS

MAFAP analysis uses four measures of market price incentives or disincentives. *First*, are the two observed nominal rates of protection one each at the wholesale and farm level. These compare observed prices to reference prices free from domestic policy interventions.

Reference prices are calculated from a benchmark price such as an import or export price expressed in local currency and brought to the wholesale and farm levels with adjustments for quality, shrinkage and loss, and market access costs.

The **Nominal Rates of Protection - observed (NRPo)** is the price gap between the domestic market price and the reference price divided by the reference price at both the farm and wholesale levels:

$$NRPo_{fg} = (P_{fg} - RPo_{fg}) / RPo_{fg}; \quad NRPo_{wh} = (P_{wh} - RPo_{wh}) / RPo_{wh};$$

The $NRPo_{fg}$ captures all trade and domestic policies, as well as other factors which impact on the incentive or disincentive for the farmer. The $NRPo_{wh}$ helps identify where incentives and disincentives may be distributed in the commodity market chain.

Second are the **Nominal Rates of Protection - adjusted (NRPa)** in which the reference prices are adjusted to eliminate distortions found in developing country market supply chains. The equations to estimate the adjusted rates of protection, however, follow the same general pattern:

$$NRPa_{fg} = (P_{fg} - RPa_{fg}) / RPa_{fg}; \quad NRPa_{wh} = (P_{wh} - RPa_{wh}) / RPa_{wh};$$

MAFAP analyzes market development gaps caused by market power, exchange rate misalignments, and excessive domestic market costs which added to the $NRPo$ generate the $NRPa$ indicators. Comparison of the different rates of protection identifies where market development gaps can be found and reduced.

4. INTERPRETATION OF THE INDICATORS

Based on the MAFAP methodology and calculation of the relevant indicators summarized in Box 1, domestic prices, both at farm gate and wholesale levels, are compared with observed and adjusted reference prices. Reference prices reflect prices that producers could get in the absence of policies. Indicators of price difference between domestic and reference prices are calculated at wholesale and farm level.

Figure 11 graphs the gaps between reference prices and wholesale and farm gate prices. As shown in Figure 11, the price gaps between domestic and reference prices are significant and negative (see also Annex I). Prices at the point of competition are consistently low relative to the reference prices especially in 2005 and 2007 when domestic prices fell short of reference prices by an average of about Birr 1880 per tonne.

The price deficits for adjusted prices (PGawh) are greater than the price deficits for observed prices during the whole period of analysis. This negative price wedge reveals that the depressed domestic price benefit net wheat consumers since they paid much lower price than the equivalent international prices. Conversely, the low farm gate price indicate that producers have faced a disincentive. Observed price gaps at farm gate (PGofg) were negative in all the years except 2009 and ranged from Birr 68 per tonne in 2009 to Birr -1,296 per tonne in 2007. The losses to farmers worsen if we look at the adjusted price (PGafg) and the year 2007 represented the worst period for farmers (Figure 11).

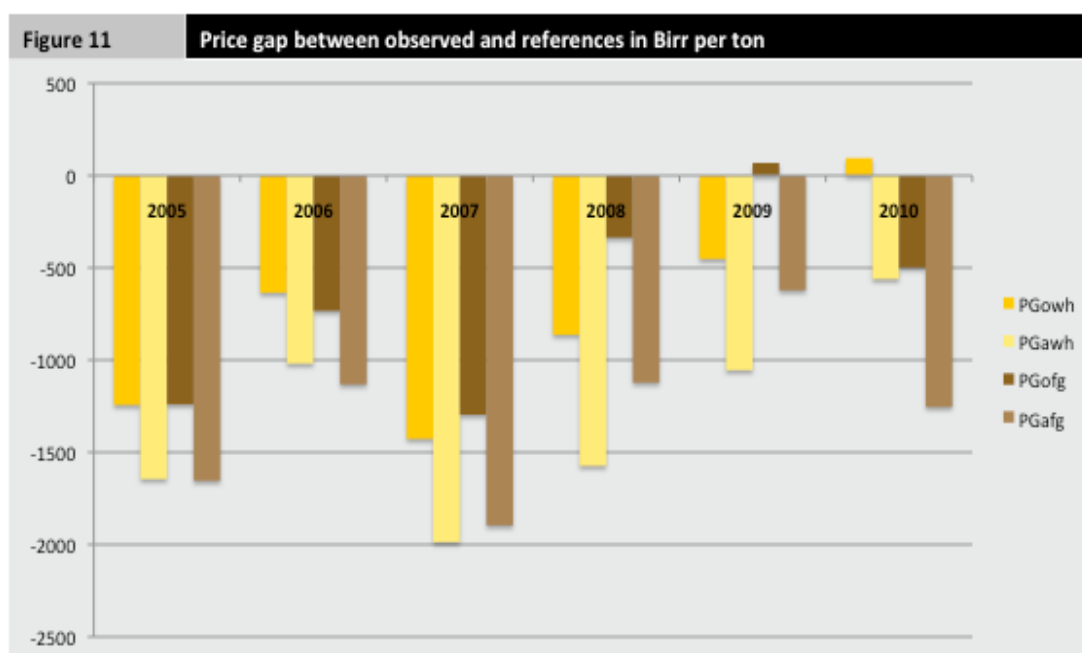


Table 6: MAFAP price gaps for wheat in Ethiopia 2005-2010 (Birr/T)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	M	m	m
Observed price gap at wholesale ¹	-1244	-635	-1427	-863	-452	95
Adjusted price gap at wholesale ¹	-1644	-1019	-1987	-1573	-1055	-561
Observed price gap at farm gate ²	-1240	-733	-1296	-336	68	-498
Adjusted price gap at farm gate ²	-1654	-1132	-1896	-1122	-622	-1253

Source: Author's calculations based on our estimation.

Consistent with the negative price wedges, the nominal rate of protection (NRP) is negative at the wholesale as well as at the farm gate levels (Figure 12 and Table 7). The observed nominal rate of protection (NRP - NRPowh) ranges from -41 per cent to 2 per cent between 2005 and 2010. The corresponding adjusted figures (NRPawh) were even more negative, varying from -48 per cent in 2005 to -10 per cent in 2010. Accordingly, this indicates that in the same periods wheat buyers at the wholesale level were paying respectively 48 per cent and 10 per cent less than the equivalent border prices. Obviously this resulted in a reduction of prices received by producers. Observing the NRP at farm gate (NRPOfg) and the adjusted NRP (NRPafig), it is evident that the trend was less negative in recent years.

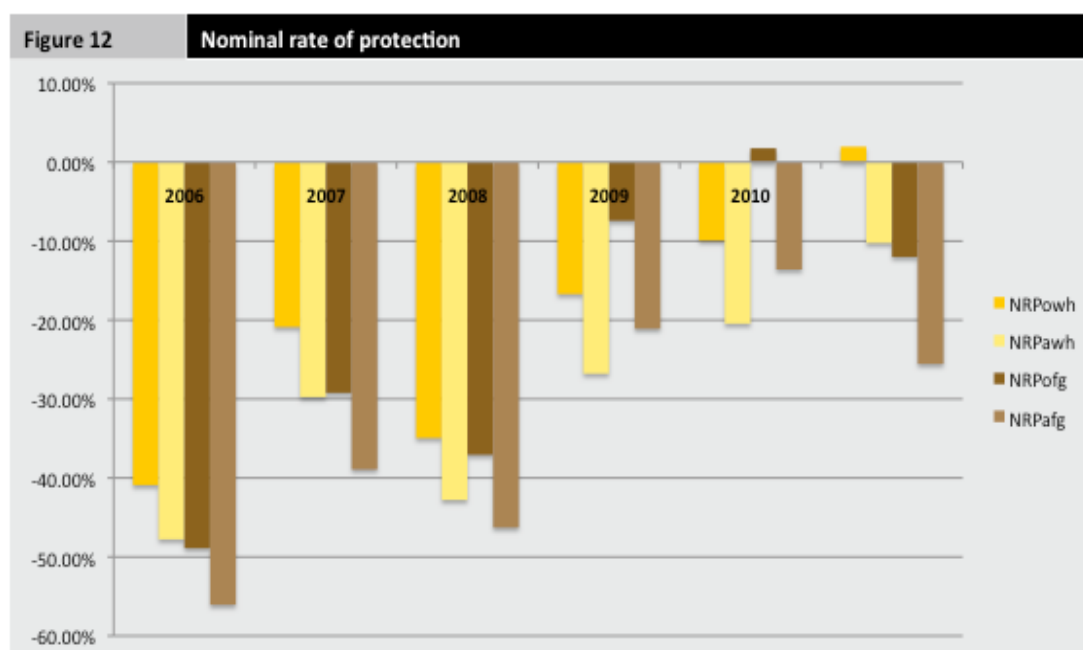


Table 7: MAFAP nominal rates of protection (NRP) for wheat in Ethiopia 2005-2010 (%)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	m
Observed NRP at wholesale	-40.89%	-20.88%	-34.94%	-16.71%	-9.93%	1.97%
Adjusted NRP at wholesale	-47.77%	-29.75%	-42.79%	-26.79%	-20.46%	-10.24%
Observed NRP at farm gate	-48.89%	-29.21%	-37.07%	-7.41%	1.76%	-12.00%
Adjusted NRP at farm gate	-56.06%	-38.92%	-46.27%	-21.09%	-13.60%	-25.55%

Source: Author's calculations based on our estimation.

5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

From 2005 through 2010, domestic prices of wheat in Addis Ababa were generally below benchmark prices. Observed price gaps at the wholesale and farm gate levels in 2005 and 2007 were particularly very high.

Adjusted nominal rates of protection at the farm gate were significantly negative, ranging -56 percent in 2005 to -13 percent in 2009. The adjusted nominal rate of protection tended to improve in 2008 and 2009 but the improvement was not sustained in 2010. While buyers or consumers benefited since they paid lower price than the equivalent international prices, wheat producers lost as they were paid much lower than the international prices.

The results of the MAFAP price indicators show that the level of disincentive to wheat farmers was considerable during the period 2005 to 2010. Ban of cereal export, overvalued exchange rates, underdeveloped markets, and distribution of imported wheat at subsidized prices (at times of high food prices) have kept domestic prices of wheat below the reference prices. Grain trading and associated transport and storage systems are based on inefficient and high costs small-scale transactions, thus contributing to low farm gate prices. Traders and millers operate with a very small amount of capital and inadequate equipment. Food aid, which is largely made up of wheat, accounts for a significant share of cereal consumption and this may have also contributed to the low domestic price levels¹⁶.

With improved policy environment and enhanced long term investment in wheat production, the country has the capacity to meet domestic demand. Wheat can be grown profitably in many parts of the country, especially in medium and high altitude areas. As observed in a recent study of several African countries, including Ethiopia, domestic production of wheat can be economically profitable and could be competitive with imports provided 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).

Preliminary recommendations:

- It is important for policy makers to reconsider policies, including distribution of imported wheat at subsidized prices, currency overvaluation and export bans, that resulted in implicit taxation of agriculture;
- Because 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 and food aid on the incentive invest in wheat related activities by farmers, traders, millers and warehouse operators.
- Though the government is upgrading to improve 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

¹⁶ 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).

incentives to farmers; this would also improve opportunities for wheat to be traded at the Ethiopian Commodity Exchange.

- government policy should be informed by the fact that low domestic prices are good for consumers only in the short run. Long-term and sustained gain to consumers can only be achieved through improved incentive to producers that translate into increased production, hence lower prices in the long term.

Limitations

Though much effort has been paid to provide a reasonable representation of the situation on the ground, two main limitations were faced. First, data on CIF prices and access costs was hard to come by and the research team had to rely on indirect estimates and an assistant who collected primary data through interviews with a small number of traders and representatives of trader associations. The available data reveals a lot of interesting features of the wheat market but further investigation and consultations with relevant government and private organizations are required to validate the access data.

Second, distortions caused by food aid were not taken into account properly. Food aid can distort incentives both for farmers (through depressing farm prices) and for traders (by distorting their arbitrage opportunities in domestic and international markets). Thus if one took food aid as well as price and trade policies into account, one would conclude that farming has been discouraged even more in Ethiopia than our estimates suggest.

Further investigation and research

Farm gate prices were estimated based on wholesale prices observed in a town (Assela) located in major wheat producing area. We adjust these figures to obtain the Hossana prices. However, improvement of the results should include information on the actual farm gate prices for Hossana area as well as other locations in different wheat producing areas. More effort is also required to acquire CIF prices from cross-border trade.

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ANNEX I: Methodology Used

A guide to the methodology used by MAFAP can be downloaded from the MAFAP website or by clicking [here](#)

ANNEX II: Data and calculations used in the analysis

Name of product		Wheat		Local currency		Birr				
International currency										
DATA		Unit	Symbol	Year trade status	2005 m	2006 m	2007 m	2008 m	2009 m	2010 m
Benchmark Price		Observed	US\$/TON	P _{b(int\$)}	260.74	255.21	348.93	422.88	289.35	290.15
		Adjusted	US\$/TON	P _{ba}						
Exchange Rate		Observed	ETB/US\$	ER _o	8.67	8.74	9.21	9.80	12.10	12.89
		Adjusted	ETB/US\$	ER _a	10.40	10.49	11.05	11.76	14.52	15.47
Access costs border - point of competition		Observed	ETB/TON	ACo _{wh}	782.07	810.40	872.23	1'018.58	1'052.20	1'080.83
		Adjusted	ETB/TON	ACa _{wh}	730.68	748.37	789.52	900.05	954.81	988.65
Domestic price at point of competition			ETB/TON	P _{dwh}	1'797.92	2'405.90	2'656.94	4'300.00	4'100.00	4'916.67
Access costs point of competition - farm gate		Observed	ETB/TON	ACo _{fg}	505.57	531.33	586.86	629.89	670.66	671.43
		Adjusted	ETB/TON	ACa _{fg}	492.31	516.75	547.09	554.32	583.16	572.00
Farm gate price			ETB/TON	P _{dfig}	1'296.34	1'776.41	2'201.00	4'196.85	3'949.85	3'652.05
Externalities associated with production			ETB/TON	E						
Budget and other product related transfers			ETB/TON	BOT	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
Quality conversion factor (border - point of competition)			Fraction	QL _{wh}	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
Quality conversion factor (point of competition - farm gate)			Fraction	QL _{fg}	1.00	1.00	1.00	1.00	1.00	1.00

CALCULATED PRICES		Unit	Symbol	2005	2006	2007	2008	2009	2010	
Benchmark price in local currency		Observed	ETB/TON	P _{b(loc\$)}	2'259.75	2'230.52	3'211.91	4'144.27	3'499.93	3'740.74
		Adjusted	ETB/TON	P _{b(loc\$)a}	2'711.70	2'676.62	3'854.29	4'973.12	4'199.91	4'488.89
Reference Price at point of competition		Observed	ETB/TON	RPo _{wh}	3'041.82	3'040.92	4'084.13	5'162.85	4'552.13	4'821.57
		Adjusted	ETB/TON	RPa _{wh}	3'442.38	3'424.99	4'643.80	5'873.17	5'154.72	5'477.54
Reference Price at Farm Gate		Observed	ETB/TON	RPo _{fg}	2'536.25	2'509.59	3'497.27	4'532.97	3'881.47	4'150.14
		Adjusted	ETB/TON	RPa _{fg}	2'950.06	2'908.24	4'096.72	5'318.85	4'571.56	4'905.54

INDICATORS		Unit	Symbol	2005	2006	2007	2008	2009	2010	
Price gap at point of competition		Observed	ETB/TON	PGo _{wh}	(1'243.90)	(635.02)	(1'427.19)	(862.85)	(452.13)	95.10
		Adjusted	ETB/TON	PGA _{wh}	(1'644.46)	(1'019.09)	(1'986.86)	(1'573.17)	(1'054.72)	(560.87)
Price gap at farm gate		Observed	ETB/TON	PGo _{fg}	(1'239.91)	(733.18)	(1'296.27)	(336.12)	68.38	(498.09)
		Adjusted	ETB/TON	PGA _{fg}	(1'653.72)	(1'131.83)	(1'895.72)	(1'122.00)	(621.71)	(1'253.49)
Nominal rate of protection at point of competition		Observed	%	NRPo _{wh}	-40.89%	-20.88%	-34.94%	-16.71%	-9.93%	1.97%
		Adjusted	%	NRPa _{wh}	-47.77%	-29.75%	-42.79%	-26.79%	-20.46%	-10.24%
Nominal rate of protection at farm gate		Observed	%	NRPo _{fg}	-48.89%	-29.21%	-37.07%	-7.41%	1.76%	-12.00%
		Adjusted	%	NRPa _{fg}	-56.06%	-38.92%	-46.27%	-21.09%	-13.60%	-25.55%
Nominal rate of assistance		Observed	%	NRAo	-49%	-29.18%	-37.04%	-7.39%	1.79%	-11.98%
		Adjusted	%	NRAa	-56.02%	-38.88%	-46.25%	-21.08%	-13.58%	-25.53%



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