An Analysis of the Potential Impact of the Elimination of EU Export Refunds for Developing Countries

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I.   Introduction

The purpose of this paper is to provide an analysis of the potential impact that EU's export refunds on developing countries after the reform of the EU Common Agricultural Policy (CAP) in 2003. The modification of export refunds was not part of the so-called Mid-term Review of the CAP; instead the proposal to abolish export refunds was actually made as part of the Doha Development Agenda discussion, which if agreement is reached, would involve the elimination of export subsidies by 2013. Nevertheless, the 2003 CAP reform moderated some of the sources of domestic imbalances in commodity markets within the EU by reducing the intervention price and the size of the intervention stocks. These imbalances would have been dealt with through the use of export subsidies.

There are different views about the impact of EU export refunds. The European Union (European Commission, 2008) considers that they are no longer distorting. Indeed, 15 years ago, the EU spent €10 billion a year on export subsidies. In 2009, the budget was for a maximum of €350 million. Whilst the main destinations concerned by export subsidies are the Mediterranean Basin and the rest of Europe, only a minimal proportion of subsidised goods find their way to Africa. In 2008 the EU claimed that there were no export refunds for cereals, rice, dairy products or fruit and vegetables and that they have pledged to phase out export subsidies entirely by 2013. However, in November 2008, export subsidies on exports of pig carcases, cuts and bellies were given as a temporary solution to solve an acute market crisis in Europe. Of this, only 8,000 tonnes went to Africa. Furthermore, in January 2009 the EU reintroduced export refunds for dairy products (within the limits on subsidised exports set by the World Trade Organisation) for the first time since June 2007.

In contrast with the European Commission (2008) position, there have been a number of studies that consider EU exports subsidies distortive and harmful particularly for developing countries (e.g., FAS-USDA, 2003; Anderson and Martin, 2006; Koning and Pinstrup-Andersen, 2007; Boulanger, 2009). Notwithstanding, studies in the quantitative trade literature appear to contradict this view. Fabiosa et al. (2005), using a partial equilibrium (PE) model, found that a global elimination of subsidies would have little upward impact on world prices in the hypothetical situation that all tariff distortions have first been removed, at least for meat, dairy and oilseeds. In terms of their trade volume effects, Bouet et al. (2005), using a computable general equilibrium model (CGE) model, found that the suppression of export subsidies only had a limited effect on trade volumes. One reason is that EU export subsidies have already decreased dramatically since the late 1990s, and this was taken into account in the baseline. Sub Saharan Africa countries experience a smaller increase in exports than most other developing countries due mainly to the erosion of preferences on the EU's market. Overall, exports of the poorest countries (sub-Saharan Africa and South Asia) increase significantly less than the average exports of the rest of the world.

As regards their welfare effects Bouet's (2008) review of a number of recent studies found that the associated increase in world welfare from full trade liberalisation (which includes more than the elimination of the export refunds) ranged from 0.2 to 3.1 per cent (with a proportionally lower impact of export refunds elimination alone). However, according to the GTAP global economy wide model and protection database, only 2 per cent of the global welfare cost of government

interventions in agricultural markets as of 2001 was due to export subsidies (Anderson et al., 2006). Also, Hoekman et al. (2004), Bouet et al. (2005) found that elimination has a very limited welfare effect. Importantly, numerous studies show that export subsidy elimination could harm net importing developing countries via a terms of trade deterioration (Gallezot and Bernard, 2004; Panagarya, 2005, Bureau and Matthews 2005; Bouet, 2008; Hertel and Keeney, 2006)

Whilst it is clear that the elimination of export refunds from their current level would have a minor impact on prices, trade and welfare; their presence (if not eliminated or reduced) open the possibility that they can be used in case of imbalances within the EU as in the cases previously cited. This is an issue that it is addressed in this paper (together with the effects of their elimination for completeness sake). However, it is important to note that many of the results of global models either PE or CGEs, due to their level of aggregation ignore the specific structure of the domestic markets in different developing countries, which at the end are crucial to whether export refunds have effects developing economies.

Thus, due to the aforementioned reasons the empirical analysis in this paper consists of two complementary parts. In section II, we present a quantitative analysis using a modified version of the Global Trade Analysis Project (GTAP) computable general equilibrium (CGE) model. In section III, we present cases studies of the potential impact of export refunds on selected developing countries. This section is broken down into two subsections: a brief description of the main facts of the market structure of the dairy industry on the mentioned countries and second a theoretical analysis of the effect that export refunds may have on those markets. Finally, conclusions are presented.

II   Modelling approach
II.1   CGE model description and scenario design

This paper employs the Global Trade Analysis Project (GTAP) CGE model (Hertel, 1997) and accompanying version 7.1 database benchmarked to 2004 (Narayanan and Walmsley, 2008). Given the focus of this study, we employ a heavily modified version of the standard GTAP. This model variant (Renwick et al., 2007) is superior to the standard GTAP model from the perspective of agricultural policy modelling in that it better captures the nuances of agricultural markets. In an attempt to maintain the model within manageable proportions, whilst taking into consideration the developing country focus of the work a 22 sector by 23 region aggregation was chosen.

The study considered a horizon of between 2004 and 2020. For comparison purposes a baseline scenario was constructed based on a "business as usual" situation, which considered the situation that no agreement was reached in the trade negotiations. More specifically, we characterise the baseline as follows: (a) EU enlargement to 27 members (remove all trade protection on intra-EU27 trade); (b) impose common external tariff for the two new EU member states; (c) decouple support payments in agricultural sectors with SFP totals in 2013 incorporated; (d) introduce modulation into the CAP budget – 20 per cent for EU15, 10 per cent for AC10 and 5 per cent for Bulgaria and Romania; (e) planned reductions in intervention prices between 2004-2013; (f) elimination of all sugar and milk quotas; (g) elimination of all set-aside; (h) everything But Arms (EBA) agreement between the EU27 and the Less Developed Countries (LDCs).

Two scenarios were considered: The first scenario, the 'maximum damage scenario', included all the adjustments made in the baseline scenario except that

export subsidies were allowed to reach their permissible Uruguay Round (UR) ceiling limits. Thus, by comparing this scenario with the baseline it was possible to examine the potential maximum damage in the long run caused by export subsidies up to 2020. The second scenario, 'export refund elimination scenario', also included all the adjustments made in the baseline scenario except that it takes a purely hypothetical position of eliminating all export subsidies along with intervention prices and stock purchases by 2013. Hence, by comparing this scenario with the baseline scenario it is possible to determine the impact of 'business as usual' export subsidies on world markets up to 2020 (or the effect that the elimination of EU export refunds would have on the world markets).

II.2   Results
II.2.1 Maximum damage scenario

The results from the maximum damage scenario are presented in Table 1. EU27 production in the affected subsidised sectors (e.g., wheat, other grains, vegetables, fruits and nuts, oilseeds, red meat, white meat, dairy, processed rice, processed sugar, other processed food, beverages and tobacco) is a function of the export refund UR limit fill rate in 2004, the absolute size of the each EU27 industry's refund limit and export revenues as a proportion of total production revenues. Moreover, trade led gains to EU27 exporting regions are also dependent on the elasticity of substitution in each importing region in response to world price falls and the relative import trade share of each EU27 export good in third markets.

Although not shown in the tables, the effect of increases in export refunds is that world prices are depressed for almost all commodities; with the exception of wheat, other grains and to a lesser extent red meat and processed sugar, the magnitude of these price falls were slight. In the majority of the developing regions, market prices fall owing to cheaper world prices and factor price falls from contracting agricultural sector output.

In cereals production, subsidy fill rates were particularly low in 2004, with the result that output in wheat (28.3 per cent) and other grains (9.4 per cent) sectors rises significantly. EU27 paddy rice, oilseeds and vegetables, fruits and nuts' production is stifled as significant agricultural sector specific land is diverted into cereals activities. Elsewhere, EU27 red meat (6.7 per cent), processed sugar (5.2 per cent) and processed rice (2.5 per cent) also benefit, whilst white meat production also increases slightly from a large base. The fact that dairy production increases by a lesser proportion (0.1 per cent) is largely due to the relatively high UR refund fill rate in 2004, whilst the percentage changes in output are calculated from a larger base value. With increases in downstream meat, rice and sugar processing, corresponding upstream sector outputs also rise (cattle and sheep (3.6 per cent), paddy rice (2.5 per cent) and raw sugar (4.6 per cent)). The expansion in agro-food industrial activity bids up factor prices resulting in small market price and retail price increases in the EU27.

It is interesting to note that the increase in export refunds has important negative impacts on specific agro-food sector's output, particularly, wheat. In the Rest of North Africa region, wheat output falls by almost 30 per cent, whilst in the West African countries, Ethiopia and Central and East Africa, wheat output reductions are between 10 per cent 26 per cent (in Senegal, wheat output is eliminated). Elsewhere, wheat output reductions in South America and the Caribbean are close to 13 per cent and 8 per cent in West Asia and the Middle East. In the case of other grains, the principal loser from the EU27 policy is the Rest of the Developed World region (rather than the developing countries).

Increases in EU27 dumped exports of red and white meat also result in consistent output reductions across all developing countries, most notably, South America and the Asian regional composites, which are the largest net exporters of those meats, respectively. Interestingly, white and red meat production in Senegal picks up slightly (from a small base value), suggesting that its trade pattern is more intra-regional than with third countries such as the EU. Increases in EU27 dairy dumping most directly affect Western Africa in percentage terms, with output reductions of up to 16 per cent in Nigeria, compared with the baseline. Finally, increases in EU sugar exports impact on Latin America, West Asia and the Middle East and Western Africa, whilst in the Caribbean, production only falls 1 per cent, suggesting that imports from the EU to this region are less important.

Turning to the trade balances, as expected the agro-food EU27 trade balance improves with notable increases in wheat (€3,157 million), red meat (€1,704 million) and white meat (€678 million). As regards trade balance in developing regions, the largest hit is taken by Latin America (€1,080 million), principally due to wheat (€541 million), red meat (€392 million) and sugar processing (€222 million) losses. Notable agro-food trade balance deteriorations are also apparent in East and South East Asia (€327 million) and the Rest of Southern Asia (€264 million), whilst in Africa, the largest losses (principally due to wheat trade) are incurred in the Rest of North Africa (€214 million). In the Rest of Central and Eastern Africa, the agro-food trade balance is positive due to the improved change for other crops (€53 million) and other food processing (€29 million). Indeed, where EU net exports have fallen (i.e., vegetables, fruits and nuts; other crops, other food processing) owing to greater diversification into marginally more heavily subsidised export activities, a number of developing countries have benefited.

Export refund elimination scenario

Table 2 presents the results from eliminating all the export refunds, where in the GTAP database, over 90 per cent of export refund expenditure in the GTAP database originates from the EU27**.** In 2004, the largest EU export refund rates were applied to processed sugar (31 per cent), red meat (29 per cent), dairy (28 per cent), processed rice (24 per cent) and other grains (24 per cent), although only extra-EU exports of other food, dairy and red meat are in notable quantities. With reductions in EU export demands from elimination of the subsidy wedge, there are moderate reductions in EU market prices compared with the baseline. The elimination of the export refunds rises world prices for agro-food commodities, although aside from dairy (where EU export refunds are considerably more pervasive), these increases are relatively moderate since in some commodities, export trade volumes are small (i.e., rice), or because the export refund rate is low (i.e., cereals).

In the non-EU developing countries, the key output and market price rises occur in the dairy sector (with concomitant rises in upstream raw milk). Compared with the baseline, dairy output in Nigeria, Senegal and the Rest of Western Africa increases 96.1 per cent, 35.2 per cent and 45.3 per cent, respectively, whilst in Tanzania and the Rest of Central and Eastern Africa, dairy output rises by about 24 per cent. With the exception of the Rest of Southern Asia, dairy output increases in the remaining regions are between 3 per cent and 7 per cent.

Table 1: Results from the maximum damage scenario

	EU27	Developing Europe	Central America	South America	Caribbean	East and South East Asia	Bangladesh	Rest of Southern Asia	West Asia and the Middle East	Egypt	Rest of North Africa	Nigeria	Senegal	Rest of West Africa	Ethiopia	Tanzania	Uganda	Rest of Central and East Africa	Southern Africa	Rest of Developed World
Percentage changes in output																				
Paddy rice	2.5	-0.2	-0.3	0.0	0.0	-0.1	0.1	0.0	0.3	0.0	4.7	0.0	-3.4	0.0	0.0	0.3	0.2	0.2	0.0	0.0
Wheat	28.3	-8.5	-3.1	-12.6	-11.7	-1.8	-1.7	-0.9	-7.9	-3.9	-29.8	-13.1	-99.7	-9.6	-16.9	-6.6	-2.7	-25.8	-10.7	-11.4
Other grains	9.4	-3.3	-0.4	-1.3	-0.5	-0.7	0.0	-0.1	-2.2	0.0	0.8	0.0	0.1	-0.1	0.0	-0.1	-1.2	0.0	-1.3	-1.6
Vegetables, fruits and nuts	-1.0	0.2	-0.1	0.2	0.2	0.0	-0.1	0.0	0.3	0.1	0.1	0.0	-0.6	0.2	0.1	-0.1	0.0	0.3	0.3	0.1
Oilseeds	-2.0	1.4	-0.4	0.4	-0.1	-0.3	-0.4	-0.1	0.5	0.2	10.7	-0.5	-0.4	-0.1	0.3	-0.3	-0.2	0.1	-0.4	0.3
Raw Sugar	4.6	-0.7	-0.7	-1.4	-0.9	-0.5	0.0	-0.1	-2.8	-0.4	1.6	-0.1	0.8	0.1	0.5	-0.1	-0.1	0.1	-0.3	-0.3
Plant fibres	-2.9	1.0	-0.2	0.3	0.2	-0.1	-0.2	0.0	0.2	0.3	2.8	-0.4	-5.8	-0.9	0.6	-0.4	-0.3	0.3	-0.1	0.3
Other crops	-0.7	1.8	0.4	1.0	0.4	0.2	0.0	0.1	1.1	1.4	6.2	0.9	4.7	0.4	2.0	0.2	0.9	0.7	0.2	0.4
Cattle and sheep	3.6	-3.7	-0.3	-1.2	-0.4	-0.4	0.0	-0.1	-0.1	0.1	0.5	0.0	1.7	-1.1	0.2	0.0	0.0	-0.9	-0.2	-0.6
Pigs and poulty	-0.1	-0.2	0.0	-0.3	-0.1	0.0	0.0	0.0	0.3	0.5	0.5	0.0	2.6	-0.2	0.6	0.0	0.0	-0.2	-0.1	-0.3
Milk	0.1	-0.1	0.0	-0.2	-0.1	-0.2	0.0	0.0	-0.1	0.0	-0.3	-0.5	1.5	-3.6	0.1	-0.1	0.0	0.0	-0.1	-0.1
Wool	-4.5	0.4	0.0	0.3	0.0	-0.2	-2.8	-0.1	0.1	0.1	0.4	-1.6	9.7	2.2	0.2	-2.3	-0.7	-0.6	-0.3	0.5
Red meat	6.7	-5.5	-0.6	-1.9	-1.6	-1.6	-4.7	-5.0	-2.4	-0.6	-0.5	-3.9	1.3	-8.6	-4.1	-0.5	-0.6	-4.7	-0.4	-0.8
White meat	0.7	-1.7	-0.4	-0.7	-0.9	-0.6	-3.6	-0.9	-0.1	-0.3	1.0	-1.3	1.1	-3.5	-0.7	-0.4	-0.9	-1.6	-0.4	-0.8
Vegetable oils and fats	-1.3	0.9	-0.2	0.5	0.0	-0.1	0.0	0.0	0.1	1.0	11.8	0.0	-4.6	-0.4	1.8	-0.4	-1.0	0.5	-0.3	0.2
Dairy	0.1	0.0	-0.1	-0.2	-0.1	-0.2	-0.1	0.0	-0.2	-0.4	0.3	-18.8	-0.6	-6.4	-0.4	-0.7	-0.4	-2.1	-0.2	-0.1
Processed rice	2.5	-0.1	0.0	0.0	0.1	-0.1	0.0	-0.1	-0.1	-0.1	-1.8	-0.4	22.8	2.3	21.4	-1.1	0.7	0.4	-0.2	0.0
Processed sugar	5.2	-1.3	-1.3	-2.7	-1.6	-0.5	0.0	-0.2	-3.1	-1.1	-0.1	-3.3	-4.3	-2.9	0.6	-0.1	0.0	0.0	-0.8	-0.4
Other processed food	-0.1	0.5	0.0	0.1	0.1	0.0	0.1	0.0	0.2	0.1	3.5	-0.1	-1.6	-0.1	0.2	0.0	-0.2	0.5	0.0	0.0
Beverages and tobacco	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.1	0.0	0.4	-0.2	3.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Changes in trade balances (€ millions)																				
Paddy rice	-20.0	0.0	0.0	1.0	0.0	0.0	9.0	1.0	2.0	0.0	0.0	0.0	-2.0	-1.0	0.0	2.0	0.0	1.0	0.0	6.0
Wheat	3,157.0	-417.0	2.0	-541.0	-7.0	-26.0	-2.0	-123.0	-340.0	-7.0	-676.0	-17.0	-63.0	-53.0	-16.0	-3.0	-2.0	-33.0	-19.0	-1,385.0
Other grains	487.0	-129.0	0.0	-91.0	-1.0	-34.0	0.0	-8.0	3.0	1.0	22.0	0.0	-1.0	-2.0	0.0	-1.0	-1.0	-2.0	-10.0	-295.0
Vegetables, fruits and nuts	-346.0	49.0	-3.0	23.0	3.0	-21.0	-1.0	-3.0	44.0	1.0	112.0	0.0	-2.0	-2.0	0.0	0.0	0.0	7.0	5.0	77.0
Oilseeds	-85.0	12.0	-1.0	6.0	1.0	10.0	0.0	-9.0	18.0	0.0	9.0	-1.0	0.0	-1.0	0.0	0.0	0.0	-2.0	0.0	17.0
Plant fibres	-37.0	11.0	0.0	3.0	0.0	2.0	-1.0	-2.0	8.0	2.0	9.0	0.0	-1.0	-7.0	0.0	0.0	0.0	1.0	0.0	13.0
Other crops	-561.0	2.0	9.0	125.0	5.0	23.0	0.0	18.0	59.0	1.0	37.0	3.0	-6.0	13.0	6.0	2.0	3.0	53.0	4.0	181.0
Cattle and sheep	-55.0	7.0	0.0	0.0	0.0	2.0	0.0	0.0	28.0	0.0	9.0	0.0	0.0	1.0	0.0	0.0	0.0	-3.0	0.0	9.0
Pigs and poulty	-107.0	14.0	0.0	8.0	1.0	11.0	0.0	1.0	17.0	1.0	15.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	37.0
Wool	-8.0	2.0	0.0	1.0	0.0	-2.0	0.0	-2.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	7.0
Red meat	1,704.0	-556.0	-6.0	-392.0	-7.0	-38.0	0.0	-93.0	-15.0	-1.0	8.0	0.0	-3.0	-15.0	-2.0	0.0	0.0	-32.0	-2.0	-621.0
White meat	678.0	-27.0	-1.0	-69.0	-1.0	-101.0	0.0	-1.0	-21.0	0.0	17.0	0.0	-1.0	-6.0	0.0	0.0	0.0	-10.0	-5.0	-355.0
Vegetable oils and fats	-172.0	17.0	-2.0	60.0	0.0	-35.0	0.0	-1.0	4.0	1.0	81.0	0.0	-3.0	-1.0	0.0	0.0	0.0	4.0	-1.0	43.0
Dairy	185.0	-3.0	-1.0	-23.0	0.0	-13.0	0.0	-3.0	-24.0	-4.0	7.0	7.0	-1.0	-3.0	0.0	0.0	0.0	-3.0	-3.0	-133.0
Processed rice	9.0	0.0	0.0	-1.0	1.0	-44.0	-1.0	-20.0	7.0	-2.0	0.0	0.0	46.0	14.0	0.0	-1.0	0.0	3.0	0.0	-6.0
Processed sugar	410.0	-21.0	-19.0	-222.0	-13.0	-34.0	0.0	-15.0	-68.0	-2.0	-0.1	2.0	2.0	3.0	1.0	-2.0	0.0	1.0	-10.0	-78.0
Other processed food	-398.0	93.0	0.0	34.0	5.0	-19.0	0.0	-3.0	42.0	3.0	131.0	0.0	-15.0	-6.0	0.0	0.0	0.0	29.0	2.0	97.0
Beverages and tobacco	42.0	2.0	-1.0	-3.0	-1.0	-6.0	0.0	-1.0	6.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	-2.0	-46.0
Agricultural food	**4,882.0**	**-944.0**	**-23.0**	**-1,080.0**	**-14.0**	**-327.0**	**4.0**	**-264.0**	**-228.0**	**-7.0**	**-214.0**	**-6.0**	**-53.0**	**-66.0**	**-10.0**	**-3.0**	**0.0**	**16.0**	**-42.0**	**-2,432.0**

Table 2: Results from the elimination of export refunds scenario

	EU27	Developing Europe	Central America	South America	Caribbean	East and South East Asia	Bangladesh	Rest of Southern Asia	West Asia and the Middle East	Egypt	Rest of North Africa	Nigeria	Senegal	Rest of West Africa	Ethiopia	Tanzania	Uganda	Rest of Central and East Africa	Southern Africa	Rest of Developed World
Percentage changes in output																				
Paddy rice	0.9	0.7	0.2	0.3	0.0	0.1	0.0	0.0	-0.1	0.1	-0.6	0.0	-3.4	-0.1	1.5	0.9	-0.1	-0.4	0.3	0.1
Wheat	0.1	-0.2	0.3	-0.1	-1.2	0.2	1.1	0.1	0.3	0.1	-0.4	0.0	-6.7	0.1	0.8	2.2	0.0	0.6	0.4	-0.2
Other grains	-1.7	1.2	0.1	0.4	0.3	0.4	0.2	0.1	0.8	0.1	0.4	0.0	-0.1	0.0	0.0	0.1	0.2	0.1	0.3	0.8
Vegetables, fruits and nuts	0.5	0.2	0.0	-0.1	-0.2	0.1	0.1	0.0	-0.1	0.1	0.0	-0.1	-1.2	-0.1	0.1	0.8	0.0	0.1	0.0	-0.1
Oilseeds	1.0	-0.5	0.2	-0.3	-0.2	0.0	0.6	0.0	-0.2	0.0	-0.1	0.4	-0.6	-0.1	2.8	0.6	0.3	0.6	0.3	0.0
Raw Sugar	-1.0	1.0	0.5	1.2	-0.1	0.5	-4.8	0.0	2.7	0.3	1.7	0.1	-0.1	-0.6	-10.7	-5.1	-1.2	-3.6	0.1	0.4
Plant fibres	1.4	-0.4	0.1	-0.1	-0.3	0.0	0.4	0.0	0.2	-0.3	-0.2	0.4	-3.0	0.0	0.5	1.7	0.7	0.3	0.1	-0.1
Other crops	0.0	-0.8	-0.4	-0.7	-0.5	-0.3	0.1	0.0	-0.2	-1.1	-0.7	-0.5	-3.7	-1.2	0.7	0.3	-0.2	-0.2	-0.1	-0.2
Cattle and sheep	-1.0	1.3	-0.4	0.6	1.2	0.5	0.0	0.1	0.0	0.1	0.3	0.0	-0.6	0.4	-0.2	-0.3	0.1	0.5	0.1	0.3
Pigs and poulty	-0.5	0.2	-0.2	0.6	0.8	0.1	0.0	0.0	-0.1	-0.4	-0.1	0.0	-0.2	0.5	-0.1	-0.2	0.1	0.5	0.2	0.4
Milk	-5.6	1.2	1.9	2.7	4.3	4.7	0.0	0.1	3.5	0.1	9.1	2.6	26.3	27.3	0.1	-0.3	0.1	1.4	1.6	2.1
Wool	2.9	-0.2	-0.1	-0.2	-0.8	-0.1	1.1	0.0	-0.1	-0.8	0.0	-0.2	-2.1	-3.6	0.7	2.2	0.7	0.4	0.1	-0.2
Red meat	-2.7	2.1	-0.6	0.9	1.0	0.5	1.8	2.0	0.8	0.4	0.7	0.8	-0.3	2.3	2.5	0.4	0.2	1.7	0.1	0.4
White meat	-0.8	1.9	-0.3	1.0	0.0	0.3	4.5	0.9	0.1	0.3	0.1	1.1	0.4	3.9	0.7	0.0	0.4	1.2	0.4	0.9
Vegetable oils and fats	0.4	-0.3	0.1	-0.4	-0.1	0.0	0.4	0.1	0.0	-0.5	-0.9	0.0	-1.7	0.2	2.0	2.1	1.3	0.2	0.2	0.1
Dairy	-7.1	7.1	3.6	4.0	5.8	5.1	5.7	0.8	5.8	6.9	19.8	96.1	35.2	45.3	19.3	24.4	8.6	24.2	4.0	2.7
Processed rice	0.1	0.6	0.0	0.1	-0.3	0.1	0.0	0.1	0.6	0.1	1.9	0.4	-1.5	-0.8	-7.7	-1.0	-0.8	-0.6	0.2	0.0
Processed sugar	-1.7	1.5	1.0	2.3	-0.5	0.6	-5.2	0.0	2.7	0.8	2.0	2.4	4.6	-6.3	-13.1	-9.2	-6.2	-6.4	0.3	0.4
Other processed food	-0.7	0.8	0.3	0.4	0.2	0.4	0.6	0.2	0.7	0.5	0.6	1.6	0.9	1.4	0.6	0.4	1.8	0.4	0.4	0.1
Beverages and tobacco	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	-0.1	0.0	0.2	-0.1	0.0	0.0	0.0	0.0
Changes in trade balances (€ millions)																				
Paddy rice	4.0	0.0	0.0	0.0	-1.0	-1.0	-2.0	0.0	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	3.0	0.0	0.0	0.0	-1.0
Wheat	126.0	-25.0	-1.0	-16.0	-2.0	-10.0	0.0	5.0	-34.0	-5.0	-18.0	0.0	0.0	0.0	1.0	0.0	0.0	-1.0	-1.0	-20.0
Other grains	-62.0	22.0	0.0	6.0	-4.0	4.0	0.0	2.0	-18.0	-2.0	-2.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	55.0
Vegetables, fruits and nuts	222.0	-43.0	1.0	-12.0	-7.0	7.0	1.0	5.0	-35.0	-1.0	-16.0	0.0	-1.0	-1.0	1.0	3.0	0.0	-1.0	-1.0	-99.0
Oilseeds	87.0	-5.0	0.0	-13.0	-4.0	-23.0	0.0	1.0	-25.0	-1.0	-1.0	1.0	0.0	0.0	2.0	1.0	0.0	2.0	0.0	-11.0
Plant fibres	19.0	-5.0	0.0	-3.0	-1.0	-4.0	1.0	1.0	-9.0	-1.0	-1.0	0.0	-1.0	1.0	0.0	1.0	0.0	3.0	0.0	-2.0
Other crops	417.0	-6.0	-10.0	-98.0	-7.0	-31.0	1.0	-15.0	-61.0	-2.0	-3.0	-2.0	0.0	-30.0	2.0	3.0	-1.0	-18.0	-4.0	-117.0
Cattle and sheep	41.0	1.0	0.0	1.0	1.0	-2.0	0.0	0.0	-11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	-34.0
Pigs and poulty	68.0	-8.0	0.0	-7.0	-2.0	-16.0	0.0	-1.0	-11.0	-1.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.0	-1.0	-20.0
Wool	7.0	-1.0	0.0	-1.0	0.0	-2.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	-3.0
Red meat	-605.0	186.0	-15.0	186.0	-5.0	28.0	0.0	42.0	2.0	0.0	8.0	0.0	0.0	6.0	3.0	0.0	0.0	19.0	5.0	226.0
White meat	-731.0	44.0	-7.0	124.0	0.0	89.0	0.0	1.0	27.0	0.0	2.0	0.0	0.0	6.0	0.0	1.0	0.0	17.0	7.0	434.0
Vegetable oils and fats	136.0	-12.0	0.0	-68.0	-2.0	-8.0	0.0	3.0	-11.0	-4.0	-7.0	0.0	-1.0	-1.0	0.0	1.0	0.0	0.0	0.0	-23.0
Dairy	-4,703.0	579.0	40.0	447.0	63.0	357.0	5.0	78.0	777.0	62.0	75.0	-2.0	6.0	24.0	1.0	0.0	1.0	35.0	58.0	2,413.0
Processed rice	1.0	0.0	0.0	0.0	-1.0	6.0	0.0	13.0	-7.0	1.0	-1.0	0.0	-3.0	-4.0	0.0	-1.0	0.0	-6.0	0.0	8.0
Processed sugar	-458.0	14.0	12.0	404.0	-11.0	19.0	-58.0	-6.0	47.0	0.0	10.0	-2.0	0.0	-20.0	-37.0	-66.0	-6.0	-79.0	3.0	32.0
Other processed food	-575.0	51.0	11.0	112.0	0.0	300.0	6.0	46.0	65.0	5.0	15.0	-2.0	3.0	20.0	2.0	7.0	3.0	25.0	25.0	-35.0
Beverages and tobacco	-17.0	-2.0	0.0	0.0	0.0	2.0	0.0	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	19.0
Agricultural food	**-6,023.0**	**790.0**	**31.0**	**1,062.0**	**18.0**	**715.0**	**-47.0**	**175.0**	**691.0**	**52.0**	**60.0**	**-7.0**	**1.0**	**0.0**	**-26.0**	**-46.0**	**-3.0**	**0.0**	**93.0**	**2,822.0**

As the most protected EU export sector (in terms of the subsidy rate), the main beneficiaries from elimination of export refunds for processed sugar are Senegal (4.6 per cent), Nigeria (2.4 per cent) (both from very small bases), West Asia and the Middle East (2.7 per cent), South America (2 per cent) and the Rest of Northern Africa (2 per cent). In the East African countries and the Rest of West Africa, sugar production falls (from a small base) partly owing to increased production in South America, and also increased specialisation in other agro-food activities in these countries. Aggregating over all developing regions, the increase in net export earnings on agro-food trade from the elimination of all export refunds is €2,714 million. Of this total, the majority is due to dairy trade and, to a lesser extent, other food and red meat trade. An important proportion of the EU27's dairy trade balance deterioration (€4,703 million) in dairy is picked up by other developed countries (Rest of the Developed World - €2,413 million)), although notable net export earnings improvements also occur in West Asia and the Middle East (€777 million), South America (€447 million) and East and South East Asia (€357 million).

Summing over all of North Africa, net dairy export earnings improve by €135 million in North Africa (approximately half of which accrues to Egypt), and €35 million and €58 million in all Central and Eastern African regions and all Southern African regions, respectively. In the case of other food, the largest proportion accrues to East and South East Asia (€357 million), whilst South America witnesses net export revenue gains of €186 million from red meat trade. In the case of sugar, most of the EU's trade balance losses are picked up by the largest sugar net exporter, South America (€404 million).

II. Case study: dairy
The purpose of this section is to use a case study (including several countries) to illustrate how important the structure of domestic markets is in terms of the effects that EU export refunds may have on developing countries. In other words, the effect that export refunds (through imports) have on different economic agents within countries depends on how their markets are structured.

For this purpose dairy markets are briefly studied in selected countries, namely Bangladesh, Egypt, Ethiopia, Nigeria, Senegal, Tanzania and Uganda. The section is structured as follows: (1) A description of the dairy wheat markets in the selected countries is presented and (2) it is followed by the modelling of the two market structures found in the countries. The choice of dairy markets is due to their recent use by the EU.

Description of the dairy markets in the selected countries
Table 3 summarises the main characteristics of the dairy markets in the studied countries. The table considers four items for each one of the markets namely, the characteristics of the domestic production (e.g., nomadic), of the processing sector (e.g., import dependent), the marketing channels (e.g., informal and formal channels coexisting) and finally the role of imports (e.g., whether they are significant and whether they compete with the domestic production).

Table 3: Summary of organisation of dairy markets in selected developing countries

	Bangladesh	Egypt	Ethiopia	Nigeria	Senegal	Tanzania	Uganda
Milk production	• Dairying is nearly always a part of mixed farming systems (beef and dairy). • Milk production is low due to low milk yields and feed constraints. • Constraints to dairy cattle production are the shortages of quality feeds and fodder, the breeds of cattle, poor management practices, limited access to veterinary care and disorganised marketing systems.	• Milk is supplied from both domestic sources and imports. Total Egyptian fluid milk production is estimated around 3.2 million MT.	• Smallholder farmers represent about 85 % of the population and are responsible for 98% of the milk production. Productivity is low, poor feeds and support services are inadequate (SNV, 2008). • There is also commercial specialised dairy farms around the urban centres start to develop with their own processing facilities and marketing schemes. (SNV, 2008).	• The local herdsmen (mostly in the dry northern Nigeria) own and maintain the majority of the cattle and the cattle are fed on natural grass under the traditional system. • Migrant pastorals move flocks over months and many miles to find pasture during the dry season, which often results in weight loss, low yields and sickness.	• The local milk production system relies on climatic conditions with higher production during the rainy season and a slow down and even stoppage during the seven month long dry season. • Local producers are not well organised except the few modern producers in the major cities.	• Supply of milk is generally high during the rainy season when dairy feeds are adequate compared with the dry season when feeds are scarce.	• Steady increase in the number of improved dairy cattle, national milk production, proportion of milk produced and marketed by smallholders. (Baltenweck et al., 2007). • Ugandan milk production is largely dominated by small-scale farmers who own over 90 per cent of the national cattle population (Garcia et al., 2008).
Dairy processing		• In Egypt, most fluid milk is consumed in the form of cheese and other dairy products, feta cheese being the preferred one. (FAS, 2003). • 70% of Egypt's total production of Feta cheese is still produced by small-unlicensed factories from unpasteurised milk, despite an existing standard that prohibits it. • The remaining 30% is produced by modern factories.	• The traditional processing and marketing of dairy products, especially traditional soured butter, dominate the Ethiopian dairy sector.	• Most of Nigeria's dairy processors import milk powder and re-constitute it into liquid milk and other dairy products such as yoghurt, ice cream and confectioneries. • Others repackage imported powdered milk into small affordable sachets.	• A growing number of local companies produce yogurt from imported milk powder.	• In Tanzania, most of the milk sold is either unprocessed or informally processed liquid milk.	

(continues)

Table 3: Summary of organisation of dairy markets in selected developing countries (cont.)

	Bangladesh	Egypt	Ethiopia	Nigeria	Senegal	Tanzania	Uganda
Marketing channels	• In Bangladesh there are two different systems of milk marketing: (i) village systems—where milk from farmers is marketed to consumers by middlemen; and (ii) organised collection of milk from farmers for processing and marketing by private enterprises.		• In Ethiopia, most of the local milk production is marketed under informal channels. • Milk collection, processing and marketing are not developed. Urban, peri-urban and rural milk production systems are dominated by informal marketing systems. The formal market also appears to be expanding with the private sector. (SNV, 2008).	• Small proportion of domestic production entered formal marketing channels through the milk collection co-operatives of migrant herdsmen and the output of the few commercial dairy farms. • The rest is either consumed within producing families or traded informally within the producing communities.	• NGOs and donors assist small rural milk producers to improve the distribution systems and increase their capacity to access urban markets. • The most consumed dairy products in the market are milk powder (in bulk or packaged small bags), sweet concentrate milk, and unsweetened concentrated milk.	• Milk is mostly sold through informal marketing channels which deal mainly with raw milk and traditional dairy products. This is because of the unwillingness of many consumers to pay for the extra costs of pasteurisation in the formal marketing sector, and also due to preferences (Omore et al., 2009).	• There are two marketing channels: the formal and informal sector (90% of the marketed milk) (raw unpasteurised milk market) leaving only 10 per cent to be processed and packaged before marketing. • Uganda also exports dairy products mainly to the regional market (SNV, 2008).
Presence of imports	• Availability of large quantities of low price imported powder milk in the local market has contributed significantly to the low domestic milk price. • As a result, local producers and milk marketing organisations cannot compete with the milk importers. High import dependence of the domestic processing industry. (Jabbar, 2005).	• Dairy processors rely increasingly on local production rather than on imports since the government's three-year safeguard duty on milk powder imports which expired in 2003. • Furthermore, the fluctuation of the Egyptian pound has made imports more expensive relative to local products.	• Import dependency of Ethiopia for milk and dairy products has increased. To bridge the gap between supply and demand, dairy imports increased significantly partly due to increased food aid (WFP) milk powder imports. • It has estimated that imported milk powder accounted for 23 per cent of Addis Ababa market (SNV, 2008).	• Nigeria imports dairy products (mostly milk powder) from New Zealand, Australia, South America, the EU, India, Ukraine, Poland, and other smaller suppliers. • Milk powder is preferred because of its ease of handling for industrial manufacturers of confectionery, ice cream, yoghurt, and other products.	• Imports of dairy products have continued to grow over the last two years as Senegal's milk industry is primarily dependent on imported milk powder. • Importers of powder milk form a strong political lobby and dominate the dairy industry.	• Imports of powdered milk (whole and skimmed) followed by concentrated and condensed milk and UHT. In addition, cheese, butter and yoghurt. (EU equal to 20% of imports). • Tanzanian imports of dairy products are negligible but they are important in targeted urban and niche markets (Sharma et al., 2005).	• Although there are imports of dairy products, according to FAO figures they represent less than 2 per cent of the production. • Furthermore, the total quantity of milk and milk products imported has been declining progressively since 2003 (SNV, 2008).

Dairy market structures found in the selected countries

The described dairy markets of the selected countries can be grouped into two categories: unregulated markets and dual markets, both with different results in terms of the effects that changes in international dairy prices may have on their domestic economies.

Unregulated markets

The main characteristic of this model is the coexistence of domestic production and imports due to the fact that the domestic production cannot cope with the domestic demand. Therefore, there is competition between the domestic and the imported product. It is unregulated in the sense that the government does not intervene in the market.

The model is presented in Figure 1 and comprises two panels; the lower panel represents the raw commodity (i.e., milk) and the upper panel represents the processed product (*e.g.*, dairy product). The import supply of milk powder (S_W) is presented by the flat line at the world price (P^*), the domestic supply is given by (S_F). The demand for the processed product (D_D) determines the import requirement. Examples of this case are the dairy sector of Bangladesh and Egypt.

In this case, the effect of change in import prices on the domestic economy is quite clear because they depress domestic prices which benefits consumers and damage the domestic production.

Dual markets

This is represented in Figure 2, and aims to represents the dairy sector in Nigeria, Ethiopia, Senegal, Tanzania and Uganda. The figure presents three panels. The bottom panels represent the situation of the raw material (i.e., milk) for the informal and formal markets. Note that most of the domestic production is sold in the informal market (rural market) and only a small proportion (which varies by country) finds its way to the formal market. The main reason advanced in the literature for this framework is the existence of high transaction costs coming from an underdeveloped marketing system that is not capable to collect the disperse supply of milk. It is important to point out that the domestic production of milk is in the hands of nomadic producers, where seasonal patterns in production are very important.

The formal market is connected with the processing sector, which mostly operates based on imports (e.g., dried powder milk that is reconstituted), which produces dairy products for an affluent urban population.

As regards the impact of changes in export subsidies on the domestic production, this is relatively small because the competition between the domestic production and imports is limited (nevertheless, a small negative effect would be expected as some of the marketed milk finds its way to the formal market). Furthermore, an export subsidy would reduce the price of an input for the formal market and reduce the price of the processed products benefiting both processors and urban consumers. Clearly, however, this beneficial impact of export refunds is specific to the idiosyncracies of the dairy market.

As the described situation seems to be preserved, one should not expect any difference between the short and the long term. However, despite the fact that export subsidies might not explicitly harm the domestic markets of those countries, it is clear that they reinforce the disincentives for dealing with the high transaction costs created by the peculiar production structure.
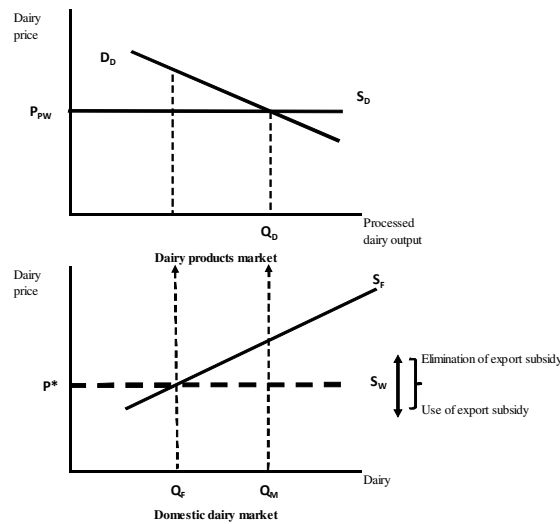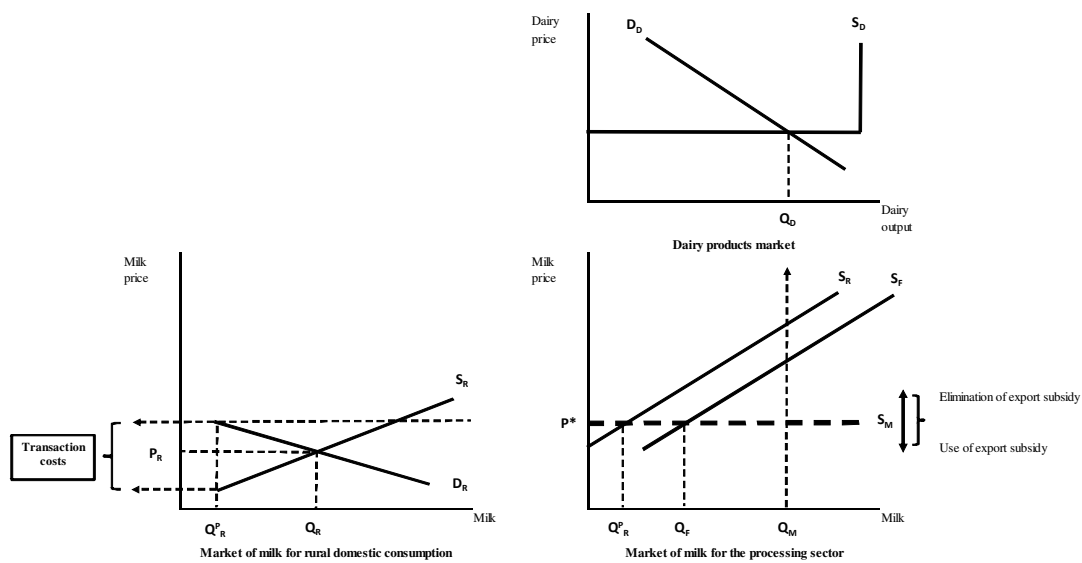
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Figure 1 - Unregulated dairy market

Figure 2 - Dual dairy market

III. Conclusions

Overall, the different analyses show that export refunds may have the possibility to create distortions on developing countries although their elimination may have small impact in terms of prices, production and welfare.

The presence of export refunds may create in developing countries disincentives either to exports, to domestic production or may help to create and maintain industrial sectors that are import dependent and do not invest in integrating domestic resources into the supply chains. Furthermore, use of export refunds to offset domestic disequilibria within export may potentially create greater variability in the world markets generating further disincentive for investment.

It is also important to note as coming from the GTAP analysis that the presence of export refunds may benefits net food importers (per capita largest in Senegal, Rest of North Africa, Rest of West Africa) and damage net food exporters (Latin America, East and South East Asia, Rest of Southern Asia) and their elimination generate the opposite effect. However, as shown by the case study, the level and characteristics of the damage inflicted by export refunds depend on the particularities of the domestic markets in developing countries, which are complex arrangements, with cases where the effect of changes in export refunds will be almost a textbook case and others such

as in the case of dual markets, where the effect will probably be concentrated on urban areas.

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