MTID DISCUSSION PAPER NO. 75

DOMESTIC SUPPORT TO AGRICULTURE IN THE EUROPEAN UNION AND THE UNITED STATES: POLICY DEVELOPMENTS SINCE 1996

Munisamy Gopinath, Kathleen Mullen and Ashok Gulati

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ABSTRACT

Prior to the 1994 Uruguay Round Agreement on Agriculture, many developed countries supported production largely through support prices and government procurement. Since mid-1990s these countries have increasingly favored income support or direct payments over price support policies.

In this study, we outline the farm policy changes in the European Union, EU, and the United States, US, since 1996 and compare their levels of support under various policies. The producer support estimates for the EU are more than twice that of the US, although the value of EU agricultural production is only 30% more than the US production value. In the EU, reductions in the intervention (support) prices for cereals, oilseeds and beef sector have been compensated by increased direct payments, i.e., payments based on historical acreage and yield or animal head counts. In 1996, the US eliminated target prices and deficiency payments for major crops, and acreage set-sides for supply control. They have been replaced with fixed and emergency payments. However price floors (loan rate with deficiency payments) have been retained for major crops. The sugar and dairy sector policies of the EU and the US have undergone few changes since 1996.

In the case of major crops, support is generally higher in the EU (ranging from $67 per ton for cereals to over $1,100 per ton for olive oil) than in the US except in the case of cotton ($456 per ton) and rice ($111 per ton). The intervention support and direct payments for major crops as a percent of border price have remained relatively constant in the EU. The US price support and direct payment for major crops as a percent of either farm or fob price has shown an increasing trend from 1996-2000, with marginal declines in 2001. The US support levels have at least doubled for most major crops between 1996 and 2001. The direct payments are categorized as minimally trade-distorting support by the EU and the US, which led to their placement in the blue box and green box/*de minimis* exemptions, respectively.

The EU and US have increasingly used direct payments, which are *fully* or *partially decoupled* from current market conditions. Whether or not payments with varying degrees of decoupling affect production decisions has been a subject of debate. Although decoupled payments do not depend on current acreage or yield, they could impact production under uncertainty or in a dynamic context. These payments help farmers cover fixed costs, and reduce constraints in capital and labor markets. They also change farmers' attitudes towards risk and create expectations about future payments being contingent on current planting. Under uncertainty "partially coupled policies," like the US emergency payments, can induce a production response through the insurance effect (reduction in the degree of risk) in addition to the wealth effect. A review of modeling attempts shows a consensus that the wealth effects induce a relatively weaker production response than the insurance effect, but some find it of similar or even greater magnitude than the traditional subsidy effects. However, there is a wide range of estimates and substantial disagreement on the absolute magnitude of the insurance effect and its relative impact on production vis-à-vis the traditional subsidy effect. In addition, while many studies have acknowledged the importance of the expectations effects of decoupled payments, few have attempted to quantify it.

The initial EU and US agricultural proposals for the Doha round focused on reducing market access barriers and export subsidies, but refrained from limiting domestic support measures. Developing countries' effective opposition to these proposals led to the collapse of the 2003 WTO Ministerial Meeting at Cancun, Mexico. The recently announced Doha Work Program proposes complete elimination of export subsidies and significant reductions in market access barriers. In the case of domestic support, developing countries' views such as the reductions in product and non-product specific *de minimis* provisions, and the criteria for blue box payments are reflected in the proposal. At the same time, developed countries' views on the continued placement of direct payments in either blue or green box have been included in the proposal. However, agreement on the extent of reductions and the specific modalities is expected in the next 16 months. The final agreement, scheduled for presentation to members at the

Hong Kong WTO Ministerial Conference in December 2005, likely depends on whether or not the new proposals and their modalities would result in meaningful limits on domestic support.

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DOMESTIC SUPPORT TO AGRICULTURE IN THE EUROPEAN UNION AND THE UNITED STATES[1]

Munisamy Gopinath[2], Kathleen Mullen[3] and Ashok Gulati[4]

I.   INTRODUCTION

The Doha Developmental Round of the World Trade Organization (WTO) has set an ambitious agenda for multilateral trade liberalization. The agricultural sector remains in the spotlight with three areas of concern– market access, export subsidies and domestic support. The Doha Round had hit some road blocks (e.g., the failed WTO Ministerial meeting at Cancun, Mexico) due in part to the disagreement between developed and developing economies on the former's domestic support policies and their effects. The recently announced Doha Work Program (August 2004) continues to highlight the differences in developed and developing countries' views on domestic support.[5]

Developing countries argue that their agricultural sectors are seriously threatened by developed countries' domestic support policies (IFPRI Forum, 2003; New York Times, 2003). The positive association between government payments, production and exports in developed countries, accompanied by a rapid decline in world commodity prices during the late 1990s provide the basis for the developing countries' argument. Indeed, OECD countries' domestic farm support has averaged $315 billion per year between 2000-2002, several export prices have been below respective production costs of commodities (e.g., the United States' wheat support), and some subsidy levels have been

greater than the average income of more than half of the world's population (e.g., the European Union's dairy support). In contrast, the developed countries view their support to agriculture as either direct payments exempt from subsidy calculations or green box payments, which minimally affect or do not distort trade. The argument here is that the farm payments are "decoupled" from market conditions to support farm income, and do not provide production incentives.

To illustrate the contention between developed and developing countries consider the classification of domestic support from the Uruguay Round Agreement on Agriculture (URAA) in figure 1. Support to agriculture is classified into amber, blue and green box based on the degree of trade distortion of a support program/policy. The amber box contains the most trade distorting support measures (e.g., border protection; price-based payments) followed by the blue box (e.g., payments based on limited area, animal numbers and/or production). Developed and developing countries agreed to amber box or aggregate measure of support (AMS) reduction commitments, but no limits have been set for blue box (exempt) payments. In addition, three exemptions --*de minimis*, green box and developing countries—have been built into the URAA agreement. The *de minimis* provision excludes from amber box the product or non-product specific support that is less than 5% (10%) of value of production for developed (developing) countries. The developing countries' exemption allows investment and input subsidies to be excluded from the amber box. The green box mostly contains environmental programs, research and development, food aid, insurance, safety nets including income/decoupled support and other minor programs. The key issue of contention between developed and developing economies is the identification and the extent of support to be placed under the exemptions: *de minimis*, blue box and green box. The argument here is that the developed economies' increased use of exemptions has allowed them to report AMS well below their respective URAA commitments, but their total domestic support has either increased or remained unchanged.

Figure 1—Uruguay Round Classification of Domestic Support

Domestic Support

De Minimis Exemptions
Trade-distorting domestic support Exempt for subsidies that are:

Product specific
But less than 5% of value of production (10% for developing countries)

Non-product specific
But less than 5% of value of production (10% for developing countries)

Amber Box (Total AMS)
Trade-distorting domestic support subject to reductions and calculated as:

Subsidies

Product Specific AMS
Above *de minimis*

Non-Product Specific AMS
Above *de minimis*

Price Gap Method (Equivalent Measure of Support – EMS)
The difference between a fixed world reference price (1986-88) and current domestic 'administered' support prices

Blue Box Exemption
Production-limiting programs of payments based on no more than 85% of the base level of production

Developing Country Exemptions (Article 6)
For developing countries only (investment and input subsidies, domestic support to encourage diversification from illicit crops, etc.)

Green Box Exemptions (Annex 2)
Non- or minimally trade distorting policies including direct payments and expenditures on environmental programs, food aid, insurance, income safety nets, etc.

Source: de Gorter et al. (2003).

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Two key events in the new millennium - the 2002 United States' (US) farm bill and the European Union's (EU) Common Agricultural Policy (CAP) reforms including changes proposed at the recently concluded Brussels summit - have not helped resolve the disagreement. In fact, they have made the task of future world trade negotiations harder than before. The 2002 US farm bill has been criticized for expanding and retaining the current policy instruments and support levels for major agricultural commodities (Orden, 2003). The EU members have agreed to combine all support into a single decoupled farm payment by 2006, with an area base and national reserve (support payments) for each of its members. However, some coupled elements such as premiums for specific commodities (e.g., dairy) have been retained in the latest CAP reform. The purpose of this paper is to present the current and proposed future dimensions of domestic support in these two important developed regions, the EU and the US. The functioning of major domestic support instruments in each region is outlined. Changes in acreage, yield and support levels since 1996 for major commodities are traced. We then explore the channels through which developed countries' support policies can affect own/internal markets and world commodity prices. We anticipate that such an analysis will contribute to a better understanding of developed countries' domestic support policies, especially for developing countries, for use in the ongoing Doha Round of trade liberalization.

We begin with a basic comparison of the EU and US agricultural sectors. Here, we compare agricultural production and support between the EU and the US. Then, a more detailed description of the nature and magnitude of support in the EU is given in section III, followed by that of the US in section IV. Section V presents an illustration and review of the effects of domestic support policies in each region on respective domestic markets and world commodity prices. The final section provides a summary and conclusions.

2. A COMPARISON OF THE EU AND THE US AGRICULTURE

- The annual average value of EU agricultural production is about 30% more than that of the US.

- The EU domestic support estimate is more than twice that of the US in both WTO notifications and OECD computations.

- The US has increasingly used direct payments, which are not tied to current area or production or prices, but depend on a farm's historical acreage and yield. They are also referred to as decoupled payments. Some of the EU and US direct payments are tied to either production limits or current prices, in which case they are termed as partially decoupled payments. The US has reported these partially decoupled payments under the *de minimis* exemption, while the EU's production-limiting payments are included in the blue box.

- The US support levels show an increasing trend between 1996 and 1999/2000, and have fallen modestly since. Despite the lack of a clear trend in EU support levels, prices have been held stable through a combination of intervention prices and compensatory payments.

Table 1 presents some basic statistics on the structure of EU and US agricultural sectors. The value of US agricultural production is $195.26 billion, on average over 1996-2001. The EU agricultural production is valued about 30% higher than that of the US. Note that the conversion of ECU to US dollar used the direct exchange rate (Economic Research Service, US Department of Agriculture).[6] The value of EU and US agricultural exports averaged $56.85 billion and $53.77 billion, respectively, during 1996-2001. Crop product exports are more than three times that of the livestock products

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[6]Since US dollar had appreciated against the ECU/Euro for most of the 1996-2001, this conversion may overstate the value of EU production, exports, imports, protection and domestic support.

for both the EU and the US. Similarly, crop product imports account for more than 75% of total EU and US agricultural imports.

Table 1—Basic Statistics on EU and US Agriculture, 1996-2001 Averages

	EU mil. ECU	EU mil. $ [a]	US mil. $
Value of Agricultural Production [b]	240145	254553	195264
Value of Exports[c]	53630	56847	53770
Crops	38259	40555	39809
Livestock	12852	13623	11233
Value of Imports[c]	56135	59503	37094
Crops	47696	50558	28129
Livestock	8439	8945	7366
GDP per capita	21185	22456	32465
Population, 1000 people	375010	375010	277340
Farm Population (% of total)		4.5	2.0
Average Farm Size (acres)		45.5	435.3
URAA Commitment on Domestic Support [d]	69463	72242	20700
Amber Box	47650	49556	16862
de minimis	291	302	7435
Blue Box or Exempt Direct Payments	19792	20584	5471
Other Green Box	19931	20728	11228
Total	87664	91170	40996
OECD's Producer Support Estimate [d]	107811	112123	55932

[a]$/ECU =1.06. Source: Economic Research Service, USDA; 1996-2001 Average
[b]Value at farm gate. Source: OECD
[c]Includes tobacco
[d]1999

Striking dissimilarities between the EU and the US appear in two cases. The first is the average farm size, which in the case of the US is about 10 times that of the EU. Secondly, the Uruguay Round commitments on domestic support for the EU is about three and half times that of the US. However, that gap falls, when actual expenditures or support levels are compared for 1999.[7] The EU reported total producer support (amber, blue and green boxes plus de minimis) worth $91.17 billion in 1999, while the comparable figure for the US is $41 billion, excluding domestic food aid. The corresponding OECD's producer support estimates are $112.12 billion and $55.93 billion for the EU and the US, respectively, in 1999. The OECD compiles a more detailed account of all support to agriculture in member countries. The gap between the WTO and OECD estimates is payments attributable to the different methods used to compute market price support. In WTO notifications, the market price support is measured by the gap between a fixed external reference price and the domestic price. The OECD uses farmgate price as the domestic price, while government notifications use the applied administered price for the computation of market price support (de Gorter, Ingco and Short, 2002; Gulati and Narayanan, 2003).[8] Moreover, the fixed external price can be based on average fob unit values for exporting countries or average cif unit values for importing countries from the years 1986 to 1988, a period when world commodity prices were at very low levels. Moreover, some of the nonproduct specific support is omitted from the computation of green box support (e.g., US input subsidies and income tax credits).

Figure 2 presents a comparison for 1999, the last year for which official WTO notifications are available for both the EU and the US. Note that EU support levels are substantially larger than those of the US, although agricultural production values are not very different.

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[7]We have used the WTO notifications as a starting point since much of the trade negotiations are based on official or government positions and not necessarily on the support measures computed by the OECD.
[8]For instance, section IV points out that the gap between US administered and U.S. farm prices is significantly large.

Figure 2—A Comparison of EU and US Agriculture, 1999
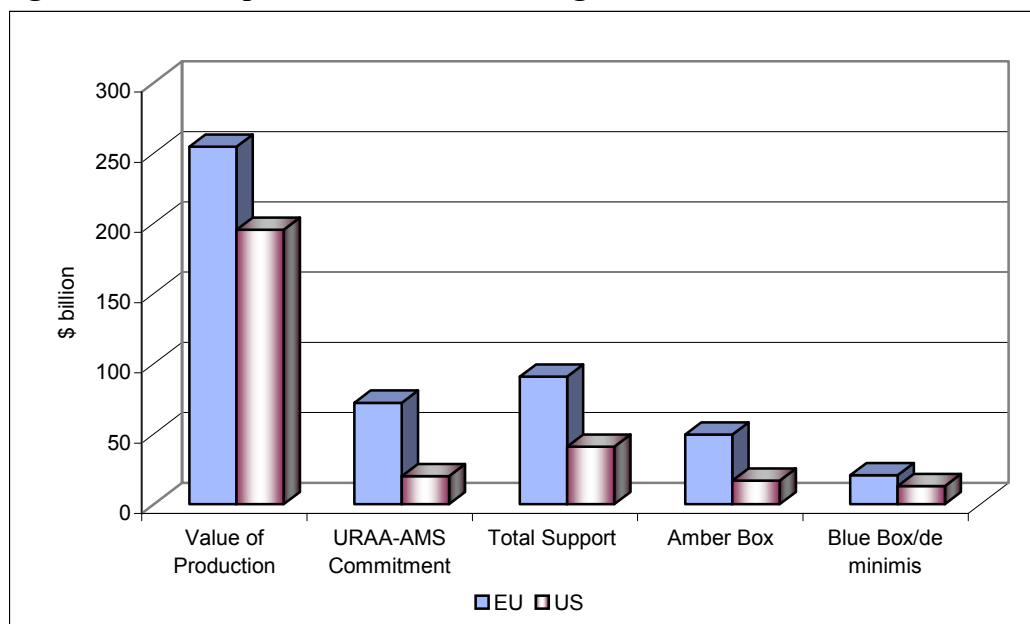
Figure 3 and table 2 present the EU and the US direct (decoupled) payments on a per acre and per ton basis, respectively. Direct payments are not tied to a farm's current production, but to its historical acreage and yield (see Baffes and de Gorter, 2002, for various definitions of decoupling). Since they vary in the degree of "decoupling," some are referred to as fully decoupled, while others that are tied to either production limits or current prices are termed as partially decoupled payments. For the EU, they are the compensatory payments for cereals and oil seeds, headage payments for beef and veal, and production aid for other crops reported in section II. Again, direct exchange rate from the US Department of Agriculture is used to convert ECU into US dollars. For the US, two measures –production flexibility contracts (PFCs) and PFCs plus market loss assistance (MLA) payments –are presented.[9]

Figure 3 compares the arable crops segment of the direct/decoupled payments for the EU and the US on a per acre basis. For the EU, it includes cereals (except rice) and oilseeds, which receive the bulk of these payments and set-aside land. The acreage under

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[9]Section III and IV provide details of EU (compensatory) and the U.S. (PFCs and MLA) payments, respectively.

crops eligible for PFC contracts only are included in the US case. Figure 3 shows that the average EU payments/acre for the arable crops is $134.87 during 1998-2001. The comparable estimate for the US is $54.08 per acre. The US average payments per acre declines to $38.31, if the soybean acreage is included. If the MLA payments are excluded, the US payments averaged $28.32 per acre over 1998-2001.

Figure 3—Direct/Decoupled Payments for Arable Crops (per acre)
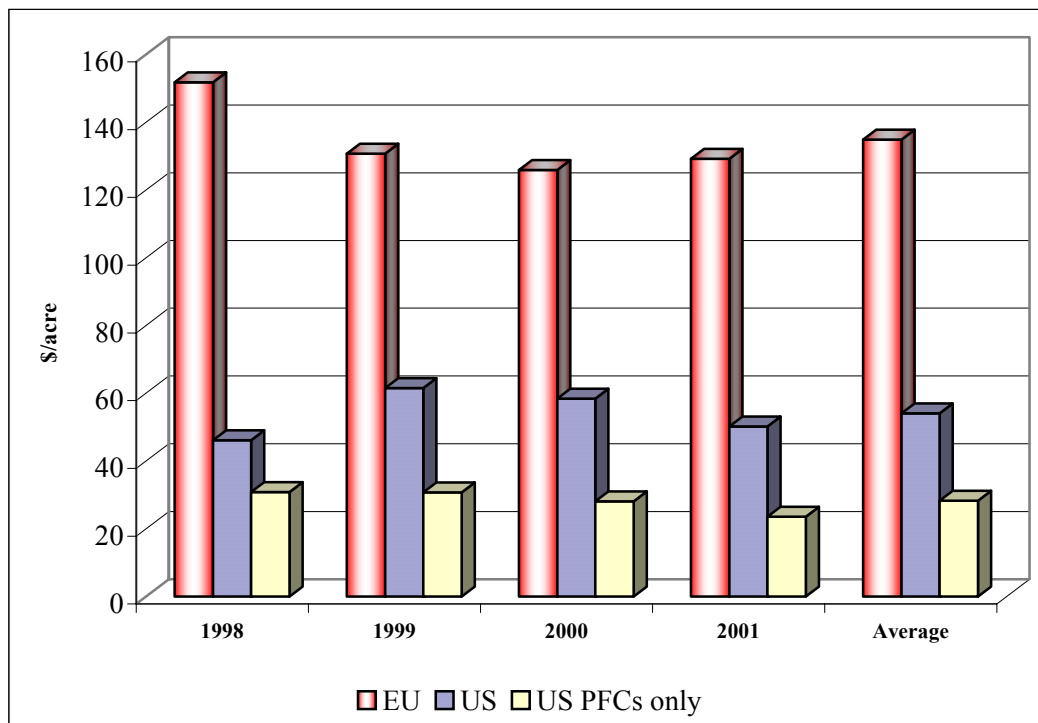
Table 2 shows that direct payments to corn and wheat in the EU are three times that of the US PFCs, on average over 1996-2000/2001. Including the MLA category makes US payments equal to about one-half of that of the EU. Direct payments to barley in the EU is close to three times that of the US. The PFCs plus MLA payments to US rice averaged $79.98/ton during 1996-2001, while EU's compensatory payments to rice are relatively new.[10] The major oilseeds in the EU receive substantial area (direct) payments compared to none for soybeans in the US. Olive oil support in the EU (Greece and Italy) is one of largest among agricultural commodities. The PFCs to US cotton

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[10]EU is a small rice producer and total compensatory payments averaged 80 million euros in recent years.

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averaged $158.73/ton during 1996-2001, but the EU's fiber sector did not receive direct payments (except flax seeds). Conversely, the beef and veal sector in the US did not receive direct payments, but the EU support averaged $821.38/ton during 1996-2000.[11] Overall, US PFCs are about a fourth of the direct/exempt payments of the EU. Including the MLA payments in the US direct payments increases its total to $9.16 billion, about half of the EU exempt payments.

Table 2—Actual Direct/Decoupled Payments Per Ton

	EU ECU/ton 1996-2000 Average	EU $/ton [a] 1996-2000 Average	US PFCs $/ton 1996-2001 Average	US PFCs + MLA $/ton 1996-2001 Average
Cereals				
Corn	29.52[b]	32.29	10.06	15.88
Wheat	47.51[b]	51.98	23.15	36.58
Rice	-	-	51.06	79.98
Barley	67.31[b]	73.64	16.10	26.25
Oilseeds				
Soybeans	-	-	0.00	0.00
Rapeseed	164.14[b]	179.57	-	-
Sunflower	172.64[b]	188.87	-	-
Olive Oil	1130.20	1236.44	-	-
Cotton	-		158.73	250.83
Beef and Veal	750.80[b]	821.38	-	
Total Direct/Decoupled Payments	20.56[c]	22.49	5.30	9.16

[a]$/ECU=1.094, 1996-2000 Average; Source: Economic Research Service, US Department of Agriculture.
[b]Source: OECD's Producer Support Estimates.
[c]1995-1999 Average.

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[11]Some of the support estimates as noted in section III.2.3, figure 5, are based OECD's listing of direct payments, unlike others directly from the European Commission.

Table 3 reports total support as a percent of border (fob or cif) prices, 1996-2001 averages, for selected products in the EU and the US. For the US, total support includes PFCs, MLAs, and (loan) deficiency payments for corn, soybeans and wheat. The US support for rice and cotton included also certificate gains, while the EU's total support included intervention support and compensatory (direct) payments. As before, the conversion from ECU to US dollar is made with the direct exchange rate for the relevant period. Since the major beneficiaries of the support policies differ between the EU and the US, direct comparisons are not possible in a few cases. Moreover, comparisons are limited by the lack of details on the EU payments.

Table 3—All Support Payments as a Percent of fob/cif Prices

	EU		US[d]
Cereals[a]			
Corn	48.8	[b]	21.7
Wheat	33.7	[b]	33.5
Rice	-		63.9
Barley	36.5	[b]	30.1
Oilseeds[a]			
Soybeans	-		9.5
Rapeseed	73.6	[c]	-
Sunflower	77.4	[c]	-
Cotton[a]	-		33.3
Beef and Veal[a]	45.4		-
Sugar			
Internal/fob price ratio	2.76		2.29

[a]Sectors with direct/decoupled payments.
[b]Total support equals intervention price plus compensatory payments minus cif price as a percent of cif Northern Europe price.
[c]For oilseeds, total payments as a percent of Ukraine export price.
[d]Total support equals PFCs, MLAs and LDPs as a percent of fob price for corn, soybean and wheat. For rice and cotton, certificate gains are included as well.

Similar to direct payment differences, EU's total support as a percent of cif price for corn is on average twice as large as that in the US. The wheat support levels are about the same in the EU and the US. The support level for barley in EU is slightly above that of the US. Support to the major oilseeds crop in the US (soybeans) averaged 9.5%, but for those of the EU (rapeseed and sunflower) it averaged 73.6% and 77.4%, respectively. The US rice support as a percent of fob price averaged 63.9% per year during 1996-2001. In the case of US cotton, all support as a percent of cif (Northern Europe) price averaged 33.3% during 1996-2001. For beef and veal, the EU support payments as a percent of border price (Australia-New Zealand price at US ports) averaged 42.9% during 1996-2001. For sugar, the ratio of internal to fob prices in EU is higher than that of the US.

In general, both the EU and US have increasingly used fully or partially decoupled payments during 1996-2001. In the case of the EU, the support commitments (Uruguay Round), actual expenditures and support as a percent of border price are significantly larger than those of the US.[12] The trend in support level is also different between the US and the EU. For the US, support levels show an increasing trend until 1999 or 2000 and have declined since. However, US support levels in 2001 are significantly higher than those in 1996. Although EU support levels do not exhibit a clear trend, prices of major commodities have been held relatively constant through a combination of intervention prices and direct payments.

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[12]The combination of high border support and production quotas makes it harder to derive the precise levels of support in commodities such as sugar and milk. However, a comparison of domestic and external prices is made for sugar and milk in both the EU and the US in sections III.4 and IV.2.4. respectively.

3. THE NATURE AND MAGNITUDE OF DOMESTIC SUPPORT IN THE EUROPEAN UNION

The CAP of the European Union has its roots in the post-World War II turmoil of its member economies. In the late 1950s, six European economies began ceding national agricultural policy authority to the European Commission, which now includes 25 member states.

3.2 BRIEF HISTORY AND BACKGROUND

The food policies of the original members of the European Economic Community - EEC (France, West Germany, Italy, Belgium, Netherlands, and Luxembourg) are largely responsible for the evolution of CAP to date. Following World War II, these six countries faced severe food shortage, while West Germany's problem included loss of productive land to the East. France and West Germany enacted agricultural price support instruments along with border protection measures, while Netherlands (a food exporter) extensively used deficiency payments. Following the Treaty of Paris in 1950, which established the European Coal and Steel Community, the so-called Green Pool negotiations aimed for a Western European Agricultural Community. Since the United Kingdom opposed ceding national authority to supranational institutions at that time, the Organization for European Economic Cooperation (OEEC) established an inter-governmental ministerial committee on food and agriculture.

The Treaty of Rome in 1955 formally established the EEC. By then, some of the original members of the EEC (e.g., France) have achieved self-sufficiency in grain and sugar, and actually faced of a problem of plenty (surplus disposal). Despite the similarity of agricultural support instruments, the magnitude of support and border protection measures significantly differed among the original members. The original Article 38 of the Treaty of Rome suggested that a "common market shall extend to agriculture and trade in agricultural product," but it "must be accompanied by the establishment of a

common agricultural policy," (Ackrill, 2000). Thus emerged the CAP of the European Community, which set out to

- increase agricultural productivity through technical progress and optimum factor utilization
- ensure a fair standard of living for the agricultural community
- stabilize agricultural markets
- assure availability of supplies, and
- ensure that supplies reach consumers at reasonable prices.

Between 1955 and 1959, the EEC analyzed and compared national policies that CAP would replace and put forward in late-1959 proposals for the market mechanisms of CAP. The EEC faced two crucial issues prior to the implementation of CAP, the choice of support instruments and the funding of CAP. For cereals, dairy and sugar the EEC recommended price support, intervention buying (and storage), and variable levies to safeguard against cheap imports. For livestock products other than dairy, and the fruits and vegetables sectors, proposed protection mostly included tariffs and some quality (nontariff) standards. The transition from individual border protection measures (early 1960s) to a customs union (early 1970s) also transferred levies on agricultural trade and domestic sugar producers to the EEC budget. An increasing share of the customs duties accrued to the EEC, so that by 1975 the revenues would pass in full to the EEC budget. The classification of CAP spending into guarantee and guidance expenditures has survived despite several reforms efforts since 1975. The guarantee expenditures are for all measures that directly influenced farm income, while the guidance expenditure dealt with structural measures (e.g., modernization of farms). Guidance expenditure is set not to exceed one-fourth of the total CAP spending.

Set in a common currency (unit account), common prices for cereals and beef emerged in 1967 and 1969, respectively. Member states converted common prices for agricultural products into national currencies using market exchange rates. However, global economic turmoil led to currency de- and re-valuation (e.g., France, Germany) in

the late 1960s to early 1970s. To prevent the transmission of unexpected currency movements to agriculture, members agreed in 1971 to use a country-specific "green rate" for conversion of common prices. For instance, if the French franc appreciated, the price of agricultural products inside France will be lower than before. To counter this, France can use a separate green (undervalued) rate to convert common prices into French francs. Thus emerged taxes and subsidies within countries in addition to CAP, also known as "Monetary Compensatory Allowances," (MCA). These green rates gave members some sovereignty over agricultural policies.

In 1972 EC-6 became EC-9 with the accession of Denmark, Ireland and the United Kingdom. Greece's entry made it EC-10, which became EC-12 when Spain and Portugal joined the community in 1986. Austria, Finland and Sweden acceded in 1995. Following the 1992 Treaty, the EC became EU, which had 15 member states (EU-15) until 2004. Currently, the EU has 25 member states. The traditional resource base of EEC couldn't cover its activities due to increases in CAP membership and prices. In 1979, the implementation of a value-added tax (VAT) of up to 1% of members' respective value-added bases alleviated the funding problem.

Between 1972 and 1984 common prices for cereals, beef and dairy products increased at rates higher than the average rate of inflation among member economies. By late 1970s, dairy products accounted for almost 35% of the EEC budget. Member countries used green rates to continue to raise prices for their respective farmers over and above the rises in common prices. Measures implemented to restrain surplus production and curtail EEC budget included a super-levy for milk production and a co-responsibility levy for other sectors. The levies are to be imposed if production exceeded a guarantee threshold, essentially a (national) production quotas for members.

Significant changes to CAP occurred in 1986 such as the freezing of common prices, the implementation of the guarantee threshold, renamed as "maximum guaranteed quantity" (MGQ) and a co-responsibility levy (e.g., 1.5% of the target price for cereals). If production exceeded MGQ, penalties in the form of an additional co-responsibility levy of 1.5% and a reduction in the following year's target price (3%) are imposed. The

initial co-responsibility levy of 1.5% is returned fully or partially if MGQ exceeded production by a certain percentage. However, the double manipulation of prices continued, i.e., increasing common prices and prices in national currencies (using green exchange rates), the later exceeding the former.

In the early 1990s, the EU faced increasing pressure from the international community to complete the Uruguay Round of trade negotiations. The EU's agricultural commissioner at that time, Ray MacSharry, is largely responsible for reducing production incentives embedded in CAP and replacing them with income support. The MacSharry reforms proposed to abolish co-responsibility levies and the stabilizer mechanisms, and to cut common prices for cereals by 30% and for dairy by 10%. In addition, the reforms proposed to cut dairy quota by 4.5%. However, direct payments (originally proposed in 1985) are to be introduced to compensate for losses arising from cuts in price and quotas.

The final agreement on MacSharry Reforms (1992) however, excluded the dairy sector. The cereals prices have been cut by 29%, but farmers received compensatory (direct) payments. In most cases, the compensatory payments offset the amount of price cut, but are pegged to past (base) acreage and yields. To be eligible for cereal compensatory payments, large farms (producing at least 92 metric tons) are required to set-aside a certain percentage of their cereal acreage. However, base acreage is set at the national or regional and not at the farm level, which provides planting flexibility to farmers. The beef and veal, and sheep sectors witnessed a 15% decline in prices in the MacSharry reforms, but again, farmers received headage (direct) payments for a production limit of 90 animals. Following a three-year transition period, the full implementation of MacSharry reforms began in 1996.

3.2 COMMON AGRICULTURAL POLICY SINCE MACSHARRY REFORMS

3.2.1 *Agricultural Expenditures in the EU Budget*

- Agriculture's share of the EU budget is over 50% on average during 1996-2001.

- Agricultural expenditures, both guarantee and guidance, have averaged about 44 billion euros. The guarantee component accounted for 90% of total agricultural expenditures during 1996-2001.

- France, Spain, Germany, Italy and UK have received significant shares of CAP expenditures.

Agriculture remains a major item of the EU budget (table 4 and figure 4). Between 1996 and 2001, the total agricultural expenditures increased from 43.152 to 45.642 billion European Currency Unit (ECU) or euros.[13] The agricultural expenditures accounted for about 52% of the total EU budget every year, except 2001-2002.

Table 4—Budgetary Expenditure on the Common Agricultural Policy, million ECU

Item	1996	1997	1998	1999	2000	2001	Average
1. Total EU Budget	80457	80003	79245	79249	77879	101051	82981
2. Total Agricultural Expenditures	43152	44714	43273	45267	41903	45642	43992
3. Guaranteed Agricultural Expenditures	39108	40423	38748	39541	40467	42083	40062
-Plant products	24877	26263	26670	26739	25812	26714	26179
-Animal products	12208	11575	9736	9440	9276	9558	10299
4. Exchange Rate ($/ECU)	1.27	1.13	1.12	1.04	0.91	0.89	1.06
5. Total Agricultural Expenditures (mil $)	54803	50527	48466	47078	38132	40621	46605

Data Source: European Commission.

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[13]The ECU has been repalced by euro on 1 January of 2002. The initial value of the euro against other currencies is set to ensure a one-to-one equivalence between the ECU and the euro. We have substituted euro for ECU wherever appropriate.

Figure 4—Agriculture's Share in the EU Budget, 1996-2001

☐ Agriculture
☐ Nonagriculture
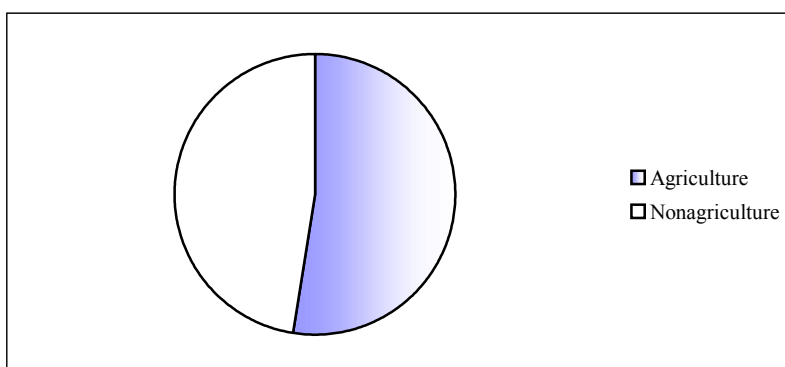
The guarantee component of agricultural expenditures averaged 40.062 billion euros during 1996-2001. Two-thirds of the guarantee expenditures are allocated to plant products, while animal products accounted for the other third. The agricultural expenditures in US dollars reveal a strong negative trend largely due to the strong appreciation of dollar with respect to ECU/euro during 1996-2001. Note, however, that the common prices are converted into national currencies by using a green exchange rate rather than the market rates until 1999. With the creation of a single currency for many of the EU countries, the green rates have become less relevant. However, Denmark, Greece and the United Kingdom maintain green rates for converting common prices and direct payments in euros into respective national currencies. Moreover, a compensatory scheme to offset losses from abolishing green rates has been fully funded by EU in 1999.

Table 5a and 5b present the country share of CAP (guarantee) expenditures and EU production, respectively. France is the largest recipient (9.248 billion ECU in 2001) and producer (56. 835 billion ECU in 2001) within EU. It accounted for, on average, 22% and 23% of EU production and CAP expenditures, respectively. Spain, Germany, Italy and UK (respectively, 5.880, 6.194, 5.348 and 4.380 billion ECU in 2001) are the next four largest stakeholders in CAP, while Netherlands' share has remained below 5%. The production and CAP expenditure shares of the members are similar, except in the cases of Netherlands and Greece.

Table 5a—CAP (Guarantee) Expenditures by Member State

Country	1996 mil ECU	1996 share (%)*	1997 mil ECU	1997 share (%)	1998 mil ECU	1998 share (%)	1999 mil ECU	1999 Share (%)	2000 mil ECU	2000 share (%)	2001 mil ECU	2001 share (%)
Belgium	1146	2.93	973	2.41	851	2.20	1003	2.54	955	2.36	939	2.23
Denmark	1356	3.47	1235	3.06	1154	2.98	1256	3.18	1305	3.22	1114	2.65
Germany	6048	15.46	5774	14.28	5553	14.33	5725	14.48	5642	13.94	5880	13.97
Greece	2817	7.20	2730	6.75	2557	6.60	2571	6.50	2597	6.42	2617	6.22
Spain	4047	10.35	4594	11.36	5294	13.66	5231	13.23	5469	13.51	6194	14.72
France	9558	24.44	9142	22.62	9007	23.25	9348	23.64	8982	22.20	9248	21.98
Ireland	1700	4.35	2034	5.03	1633	4.21	1680	4.25	1678	4.15	1599	3.80
Italy	4220	10.79	5121	12.67	4129	10.66	4656	11.78	5031	12.43	5348	12.71
Luxembourg	20	0.05	23	0.06	17	0.04	23	0.06	21	0.05	30	0.07
Netherlands	1535	3.93	1757	4.35	1373	3.54	1300	3.29	1397	3.45	1156	2.75
Austria	1212	3.10	859	2.13	843.	2.18	839	2.12	1019	2.52	1055	2.51
Portugal	645	1.65	655	1.62	637	1.64	653	1.65	652	1.61	882	2.10
Finland	648	1.66	568	1.41	576	1.49	560	1.42	728	1.80	816	1.94
Sweden	622	1.59	745	1.84	770	1.99	735	1.86	798	1.97	780	1.85
UK	3468	8.87	4401	10.89	4314	11.13	3922	9.92	4059	10.03	4380	10.41
EU-15	39108	100	40423	100	38748	100	39541	100	40467	100	42083	100

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Table 5b—Value of Agricultural Production by Member State

Country	1996 Mil ECU	1996 share (%)	1997 Mil ECU	1997 share (%)	1998 mil ECU	1998 share (%)	1999 mil ECU	1999 share (%)	2000 mil ECU	2000 share (%)	2001 mil ECU	2001 Share (%)
Belgium	6734	3.06	7100	2.83	6687	2.73	6211	2.56	6757	2.72	7034	2.74
Denmark	6976	3.17	8095	3.23	7332	2.99	7138	2.94	7797	3.14	8378	3.27
Germany	33363	15.17	41317	16.47	38348	15.65	37521	15.48	39030	15.71	40637	15.86
Greece	8529	3.88	8819	3.51	8045	3.28	8389	3.46	8709	3.50	8856	3.46
Spain	27785	12.63	29301	11.68	29890	12.20	28819	11.89	29870	12.02	31273	12.10
France	47073	21.40	56112	22.36	56181	22.93	55091	22.72	55849	22.47	56835	22.18
Ireland	4460	2.03	4435	1.77	4877	1.99	4851	2.00	5007	2.01	5193	2.03
Italy	35421	16.11	38519	15.35	38370	15.66	38953	16.07	38587	15.53	39858	15.55
Luxembourg	188	0.09	210	0.08	229	0.09	232	0.10	234	0.09	230	0.09
Netherlands	16904	7.69	18507	7.38	18690	7.63	18549	7.65	19393	7.80	20301	7.92
Austria	3654	1.66	4642	1.85	4515	1.84	4742	1.96	4686	1.89	4897	1.91
Portugal	4843	2.20	5068	2.02	4782	1.95	5312	2.19	5197	2.09	5544	2.16
Finland	2286	1.04	3109	1.24	2805	1.14	2937	1.21	3186	1.28	3243	1.27
Sweden	3369	1.53	4095	1.63	4330	1.77	3928	1.62	4201	1.69	3899	1.52
UK	18332	8.34	21579	8.60	19897	8.12	19790	8.16	19999	8.05	20105	7.84
EU-15	219916	100	250908	100	244979	100	242462	100	248500	100	256282	100

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3.2.2   Major Components of CAP

- For arable crops (cereals and oilseeds), domestic prices are protected by border measures. Intervention prices are those that are guaranteed to EU farmers. Compensatory (direct) payment have been made since 1992 (MacSharry reforms). Export refunds, which are intended to cover the difference between the EU price and world price for sale of a commodity in the world market, have declined in relative importance.
- Large farmers whose production exceeds 92 metric tons are required to set-aside a proportion of their cropland to be eligible for intervention prices. However, set-aside payments are used to compensate farmers.
- Beef and veal production is supported by threshold and intervention prices, which are protected also by import barriers. Headage (direct) payments have been made since 1992, but are limited to 90 animals per farm.
- The sugar sector operates under a quota-intervention price regime protected by border measures. Some in-quota production is eligible for export refunds, but out-of quota production received neither intervention prices nor export refunds.
- The dairy regime is based on a quota, which is distributed to member states. Intervention prices for milk, butter, cheese and milk powder (whole and skimmed) are protected through import tariffs on respective products. Surplus purchases and disposal (using export refunds) are other major policy instruments.

For cereals, a threshold price is set for each crop, which is the minimum price at which imported products may be sold inside the union. The threshold price is protected by border measures (import levies) and is equal to 155% of the intervention price.[14] The

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[14]The variable import levy system or "margin of preference" scheme did apply to all cereals including common and durum wheat, corn, sorghum, barley and rye. However, due to recent record imports of feed wheat and barley from Ukraine and Russia, the EU implemented a tariff rate quota for low and medium quality wheat and barley effective 1 January 2003. For low and medium quality wheat, a TRQ of 2.98 million tons with an in-quota duty of 12 euros per ton and out-of-quota duty of 95 euros per ton was established. Duties for other cereals continue to be based on the difference between 155% of intervention price and a calculated world reference price.

2001/2 marketing-year intervention price for cereals (wheat, corn, barley and others) is 101.31 euros per ton. The intervention price is the guaranteed price below which an intervention body designated by the EU buys in and stores the quantities produced. Aid is also granted to producers in the form of compensatory payment, currently 63 euros per ton. This payment is made on a predetermined base acreage and base (historical) yield levels, in the case of farmers whose production doesn't exceed 92 metric tons. For example, if a wheat farmer's base acreage and base yield were 40 acres and 2 metric tons per acre, then the compensatory payment would total 5040 euros. Since base acreage is set at the national or regional level, individual farmers are not necessarily bound by base acreage limits. Whenever member states exceed their respective base acreage, penalties are imposed in the form of reduction in intervention prices for the following year.

Large farmers, whose production exceeds 92 metric tons, are required to set-aside a proportion of their cropland to be eligible for intervention prices and compensatory payments. These farmers are compensated for foregone production from land set-aside (using base yields), which is currently 105 euros per ton. Durum wheat producers receive supplementary payments, which range from 139 to 345 euros per ton depending on the targeted area of production. Export refunds are intended to cover the difference between the internal price and world price for EU's sale of a commodity in the world market.

Figure 5 presents CAP expenditures on major sectors by functional categories, which do not include the traditional market price support estimates.[15] As indicated in figure 5, storage, export refunds and set-aside payments account for less than 20% of the arable crops' expenditure, meaning compensatory payments have accounted for a major share of CAP expenditures during 1996-2001.[16] In the case of oilseeds, often included in the cereals category due to similar policies, much of the expenditure is on area payments on a per hectare basis.

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[15] For instance, if the intervention and the reference (world) market prices of wheat are 110 and 95 euros per ton, respectively, the market price support equals production multiplied by 15 euros. This is not an expenditure from the CAP's budgetary viewpoint.

[16] In early 1990s, however, export subsidies alone averaged about 3 billion ECU per year.

The beef and veal sector remained the second largest component of the CAP expenditures. Similar to the cereals sector, beef and veal production is supported by threshold and intervention prices (with import tariffs), export refunds, and compensatory (headage) payments. However, the MacSharry reforms placed a limit on headage payments (90 animals per farm). The 2001/02 intervention price for beef/veal (carcasses) is 3013 euros per ton. Headage payments take the form of special, deseasonalization, slaughter and other premiums. For bulls and steers, the special premiums are 185 and 136 euros per head. Figure 5 shows that the direct payments are twice as large as those on storage and export refunds in the beef and veal sectors.

Figure 5—CAP Expenditures by Function, 1996-2001 Average
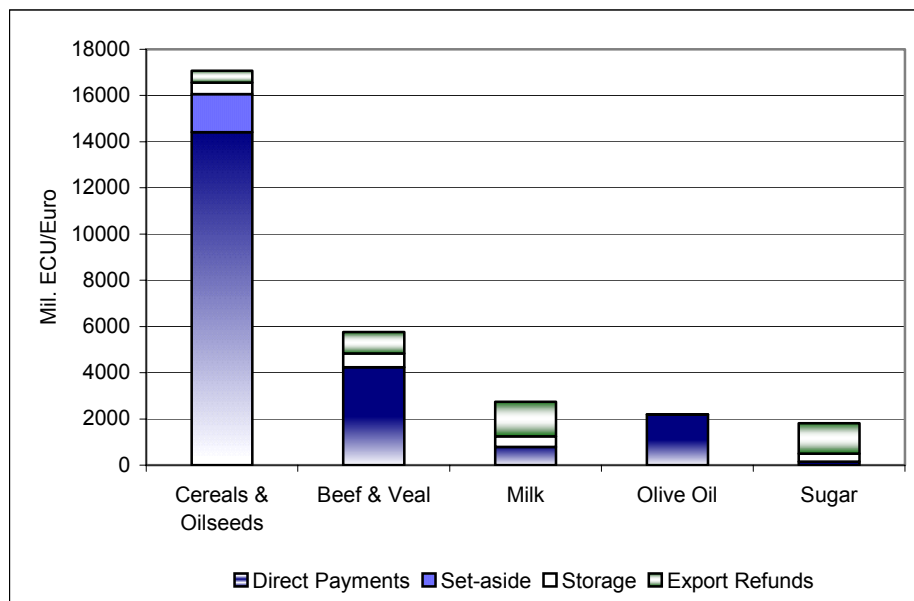
The dairy regime is characterized by a quota system that is administered at the national level along with intervention prices and border protection. Recall that the MacSharry reforms excluded the dairy sector, and so, the super-levies enacted in mid-1980s continued to impact dairy production. Intervention prices for milk, butter, cheese and milk powder (whole and skimmed) is protected through import tariffs on respective products. Surplus purchases and disposal (using export refunds) are other policy

instruments influencing the dairy sector.[17] The 2001/02 intervention prices for milk, butter and skimmed milk powder are respectively 309.80, 3282, and 2055.20 euro per metric ton. Indeed, storage and export refunds accounted for a major share of the total budgetary CAP expenditures in the dairy sector (figure 5).

The EU is the largest producer and consumer of olive oil in world markets. Prior to 1998, the olive oil sector had multiple policy instruments including intervention prices, border protection, public storage and production aid. Since 1998, production aid is based on quantity produced rather than the product of number of trees and average yields. The intervention (internal) price is protected by border measures, but public storage has been replaced with private storage contracts. The current intervention price for olive oil is 3837 euros per ton, and the production aid is 132.5 euros per ton. From the budgetary expenditure viewpoint, production aid (area payments) is the major expenditure item in this sector (figure 5).

The sugar sector in the EU operates under a quota-intervention price regime. Import tariffs are used to ensure an internal price, which is significantly higher than that in the world market. The EU maintains a basic (A) quota, which corresponds to its consumption requirement, but allows additional production and marketing flexibility in the form of a B quota. Production in B quota receives a lower intervention price than that of the A quota, but any production above A and B quota, referred to as C quota does not receive support. Exports have been possible mostly due to production under the B and C quotas. Most of the revenue from a levy on sugar processors and producers is used for export refunds. The current intervention price for white sugar is 665 euros per metric ton. Based on available data, export refund is the major expenditure item in the sugar sector (figure 5).

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[17]Direct aid for farmers based on premium units (the ratio of a farmer's reference quantity and the average milk yield in the community) and area payments for permanent pasture will be implemented in 2006.

3.2.3 Commodity-Specific Expenditures in CAP

- Support for major cereals (wheat, corn and barley) has increased in value and as a share of CAP expenditures, while that for livestock products has declined.

- Within cereals, per unit support for common wheat has remained stable, while that for corn has increased. Support for barley on a per unit basis has declined similar to those for rapeseed and sunflower.

- Expenditure on sugar support shows variability, but that on dairy has declined.

Table 6 presents the trend in the commodity composition of the CAP expenditures.[18] The arable crops category includes cereals and oilseeds. The major cereals are wheat, corn and barley, which together account for more than eighty percent of cereal production (see also table 7a and 7b). Rapeseed, sunflower and soybean are the three primary oilseed crops. The arable crops' share of the CAP expenditures hovered around 40%, with a peak in 1998 (46.3%). In terms of value, arable crops' outlay increased from 16.372 to 17.466 billion ECU during 1996-2001, with a peak in 1998 (17.945 billion ECU). A substantial share (about 75%) of the arable crops' outlay is expended on cereals, while the rest is mostly allocated to oilseeds. Allocations to some protein plants (e.g., lentils) are also included in the arable crops' expenditures.

The expenditures on sugar showed considerable variability - increasing from 1.711 to 2.113 billion ECU between 1996 and 1999, before falling to 1.497 billion ECU in 2001 (table 6). Sugar program's share of CAP expenditures thus increased to 5.3 % in 1999, but fell to 3.6% in 2001. The outlay for olive oil is greater than that for sugar. Expenditure on olive oils increased from 1.988 to 2.524 billion ECU during 1996-2001, and its share of CAP spending increased also from 5.1% (1996) to 6% (2001).

The livestock product industries (meat and dairy) accounted for less than 25% of the CAP expenditures during 1996-2001. The dairy industry's share of CAP

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[18]Note that figure 3 also presents the annual average expenditures during 1996-2001 on major sectors. The arable crops (cereals and oilseeds) received the largest allocation (about 17 billion ECU/euro), followed by beef and veal, milk, olive oil, and sugar in that order.

expenditures has fallen from 8.8% to 4.5% during 1996-2001 (table 6). Expenditures on milk decreased from 3.441 to 1.907 billion ECU between 1996 and 2001. A similar but more variable trend is observed for beef and veal sector, where expenditures decreased from 6.797 to 6.054 billion ECU between 1996 and 2001.

In share terms, beef and veal sector accounted for 17.4% of CAP expenditures in 1996, which fell to 14.4% in 2001 with the low point in 1999 (11.6%).

Table 7a presents CAP expenditures by sector/major crops on a per unit basis. The data used represent all production even though some may not qualify for support (e.g., out-of-quota sugar). For the case of cereals, expenditures per ton have increased in ECU/euro terms, but declined in US dollar terms due to the latter currency's appreciation. Expenditures per ton increased from 60.63 ECU per ton in 1996 to 66.93 in 2001, with an annual average of 63.1 ECU. In the case of oilseeds as well expenditures per ton declined from a high of 180.11 in 1996 to 156.7 ECU in 2001. The annual average expenditure per ton for oilseed crops is 151.1 ECU. Olive oil expenditures per ton increased marginally from 1030 to 1071 ECU during 1996-2000. For sugar, expenditures per ton increased from 96.71 to 115.02 ECU between 1996 and 2000, but fell to 96.58 ECU in 2001. Beef support expenditures declined on a per ton basis between 1996 and 2000, but increased to about 1996 levels in 2001. Expenditures per ton for milk production (equivalents) decreased from 28.34 to 15.59 euros per ton during 1996-2001.

Table 6—CAP (Guarantee) Expenditure by Product

Product	1996 mil ECU	share [a] (%)	1997 Mil ECU	share (%)	1998 mil ECU	share (%)	1999 mil ECU	share (%)	2000 mil ECU	share (%)	2001 mil ECU	share (%)
Arable Crops	16372	41.9	16160	39.6	17945	46.3	17866	45.2	16663	41.2	17466	41.5
Cereals					13696	35.3	13495	34.1	12656	31.3	13383	31.8
Oil Seeds					2369	6.1	2429	6.1	1625	4.0	2097	5.0
Sugar	1711	4.4	1834	4.5	1777	4.7	2113	5.3	1910	4.7	1497	3.6
Olive Oil	1988	5.1	2168	5.3	2237	5.8	2092	5.3	2210	5.5	2524	6.0
Milk	3441	8.8	3487	8.5	2597	6.7	2510	6.4	2544	6.3	1907	4.5
Beef/Veal	6797	17.4	7451	18.3	5161	13.3	4579	11.6	4540	11.2	6054	14.4

[a]Share in Guaranteed Agricultural Expenditures.
Data Source: European Commission.

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Table 7a—CAP Expenditures by Sector/Major Crops (per unit basis)

Commodity	1996	1997	1998	1999	2000	2001	1996-2001 Average
1. Cereals							
Production (mil metric ton)	206.1	205.9	211.1	201.2	213.8	200.0	206.3
Intervention Expenditure (mil ECU)*	12495	12334	13696	13495	12656	13383	13009.8
Expenditure per ton (ECU)	60.63	59.90	64.88	67.07	59.20	66.93	63.1
Expenditure per ton ($)	76.99	67.69	72.66	69.76	53.87	59.56	66.8
2. Oilseeds							
Production (mil metric ton)	12.0	14.3	15.3	16.1	14.1	13.4	14.2
Intervention Expenditure (mil ECU)*	2161	2133	2369	2429	1625	2097	2135.7
Expenditure per ton (ECU)	180.11	148.79	154.67	150.71	115.33	156.70	151.1
Expenditure per ton ($)	228.74	168.13	173.24	156.74	104.95	139.47	161.9
3. Olive Oil							
Production (mil metric ton)	1.9	2.4	2.0	2.1	2.1		2.1
Intervention Expenditure (mil ECU)	1988	2168	2237	2092	2210	2524	2139.0
Expenditure per ton (ECU)	1030.05	905.60	1146.59	1019.49	1071.26		1034.6
Expenditure per ton ($)	1308.2	1023.3	1284.2	1060.3	974.8		1130.2
4. Sugar (Raw and White)							
Production (mil metric ton)	17.7	18.6	17.4	18.4	17.9	15.5	17.6
Intervention Expenditure (mil ECU)	1711	1834	1777	2113	1910	1497	1807.0
Expenditure per ton (ECU)	96.71	98.69	102.14	115.02	106.98	96.58	102.7
Expenditure per ton ($)	122.82	111.52	114.39	119.62	97.35	85.96	108.6
5. Beef and Veal							
Production (mil metric ton)	7.95	7.90	7.65	7.69	7.40	7.27	7.6
Intervention Expenditure (mil ECU)	6797	7451	5161	4579	4540	6054	5763.7
Expenditure per ton (ECU)	854.97	943.64	674.91	595.37	613.18	833.20	752.5
Expenditure per ton ($)	1085.81	1066.32	755.89	619.19	558.00	741.54	804.5
6. Milk							
Production (mil metric ton)	121.4	120.6	121.0	121.7	121.0	122.3	121.3
Intervention Expenditure (mil ECU)	3441	3487	2597	2510	2544	1907	2747.7
Expenditure per ton (ECU)	28.34	28.91	21.47	20.63	21.03	15.59	22.7
Expenditure per ton ($)	35.99	32.67	24.04	21.45	19.14	13.88	24.5

a1996 and 1997 expenditures on cereals and oilseeds are derived using 1999 shares.
Data Source: European Commission.

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Table 7b—Cereal and Oilseed CAP Expenditures by Major Crops, 1996-2000

Commodity	1996	1997	1998	1999	2000	1996-2000 Average
1. Cereals						
Wheat						
Production (mil metric ton)	99.66	94.87	103.77	98.10	103.72	100.02
Expenditure (mil ECU)	6637.37	6504.75	6617.58	6510.41	7290.62	6712.15
Expenditure/ton (ECU)	66.60	68.57	63.77	66.37	70.29	67.12
Common Wheat						
Production (mil metric ton)	91.14	87.55	94.51	89.78	94.53	91.50
Expenditure (mil ECU)	4353.72	4241.75	4259.19	4101.54	4782.03	4347.65
Expenditure/ton (ECU)	47.77	48.45	45.07	45.68	50.59	47.51
Corn						
Production (mil metric ton)	35.48	39.38	36.21	37.49	37.90	37.29
Expenditure (mil ECU)	1017.99	938.53	939.34	922.66	1688.14	1101.33
Expenditure/ton (ECU)	28.69	23.83	25.94	24.61	44.54	29.52
Barley						
Production (mil metric ton)	52.78	52.62	51.73	49.17	51.75	51.61
Expenditure (mil ECU)	3594.21	3558.41	3443.60	3261.27	3515.53	3474.60
Expenditure/ton (ECU)	68.10	67.62	66.57	66.33	67.93	67.31
2. Oilseeds						
Rapeseed						
Production (mil metric ton)	6.85	8.54	9.41	11.42	9.42	9.13
Expenditure (mil ECU)	1541.36	1546.53	1423.65	1085.39	1585.59	1436.50
Expenditure/ton (ECU)	224.98	181.03	151.29	95.03	168.38	164.14
Sunflower						
Production (mil metric ton)	3.93	3.96	3.47	3.05	3.40	3.56
Expenditure (mil ECU)	917.24	738.84	551.61	330.26	596.56	626.90
Expenditure/ton (ECU)	233.63	186.62	159.10	108.39	175.46	172.64

Data Source: OECD Producer Support Estimates.
The production numbers are from OECD to maintain consistency with support payments.

Since expenditures reported by EU are not broken down by commodity for cereals and oilseeds, we obtained the disaggregated, commodity-specific expenditures from OECD's Producer Support Estimates (PSE). The PSE reports the sum of the direct and set-aside payments under, "payments based on limited area/output." The total expenditure for cereals and oilseeds from PSE are very close to those reported by the EU budget. Figure 6 presents the average expenditure per ton during 1996-2000 for major cereals (wheat, corn and barley) and oilseeds (rapeseed and sunflower), while table 7b presents data on production, expenditure, and expenditure per ton for each year of our sample. The trend for wheat, within which common wheat is the major category, is mixed, but payments averaged 67.12 euros per ton during 1996-2000. Expenditures per ton for corn and barley show a clear trend, however, in opposite directions. For rapeseed and sunflower, expenditures per ton have declined (table 7b).

A comparison of table 7a and 7b shows that payments per ton for wheat and barley are closer to the aggregate cereal payments per ton than that for corn. Similarly, rapeseed and sunflower payments per ton in table 7b are about the same as that of the total oilseeds (table 7a).[19]

Figure 6—EU Expenditures per ton for Major Crops, 1996-2000 Average

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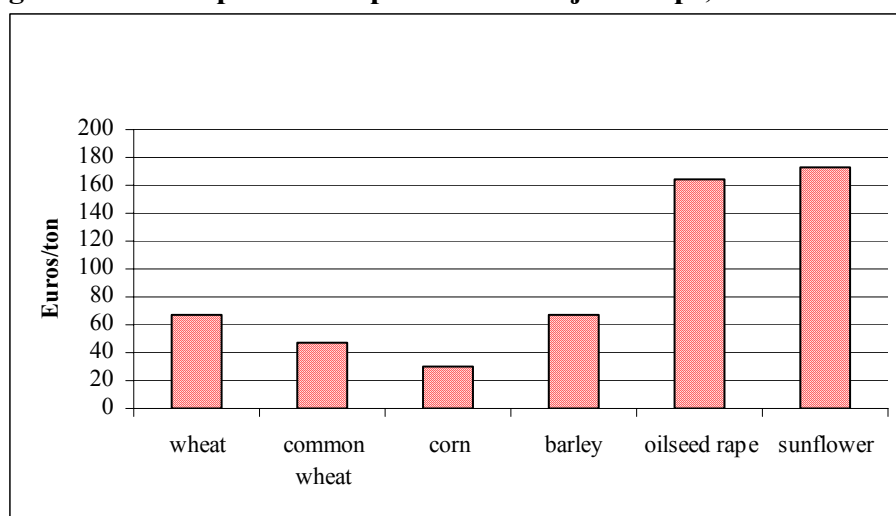
[19]The total payments for rapeseed and sunflower for 1996 and 1997 in table 7b exceed that of the oilseeds' total payments in table 7a. This is due to our allocation of arable crops expenditure into cereals and oilseeds based on the respective sector's share in total CAP expenditures (table 7a).

3.3   PRODUCTION, ACREAGE AND YIELD OF MAJOR COMMODITIES, 1996-
        2001

- Acreage under corn has grown, mostly compensating for the decline in barley and
  wheat. Oilseeds and sugar beet acreage have declined since 1996. Total acreage
  under the major crops remained about 95 million acres.

- Yield of wheat and barley have declined, while that of corn, oilseeds and sugar
  beets have grown significantly during 1996-2001.

- Cereal production has increased between 1996 and 2000, but fallen significantly
  in 2001. Within cereals corn production has grown, while wheat and barley
  production have declined. Oilseeds production has increased significantly, but
  sugar beet production has declined since 1996.

Table 8a presents area under these crops since 1996. Even as world cereal prices
decreased from 1996 to 2000, wheat area increased from 41.91 to 44.39 million acres
between 1996 and 2000, but declined to 41.53 million acres in 2001. Within wheat,
common wheat acreage has fallen, while that of durum wheat has increased. Durum
wheat acreage accounted for more than a fourth of total wheat acreage in 2001. Area
under corn has increased from 10.31 to 11.15 million acres during 1995-2001, with an
annual average of 10.55 million acres during 1996-2001. Barley acreage has fallen from
28.28 to 26.59 million acres between 1996 and 2001.

Area under primary oilseeds has witnessed a small decline from 13.57 to 13
million acres during 1996-2001. This stability masks significant gains in rapeseed and
soybean acreage, which have offset the decline in sunflower acreage. A similar declining
trend is observed for sugar beet area (5 to 4.42 million acres, 1996-2001). In terms of
growth rates, wheat, corn, and barely acreage has grown respectively at an average rate of
–0.18%, 1.57% and –1.23% per year. However, oilseeds and sugar beet acreage have
declined at an average rate of 0.85% and 2.44% per year, respectively, during 1996-2001.
The total acreage in these crops (~95 million acres) remained the same in 1996 and 2001.

The yield per acre of major crops during 1996-2001 is presented in table 8b. Corn yield has increased from 3.440 to 3.622 metric tons per acre, while that of wheat fallen from 2.385 to 2.214 metric tons per acre. Barley yield has seen a small decline from 1.87 to 1.81 metric ton per acre. The yields of oilseeds and sugar beet have increased, but a much faster rate than that of corn. Yield growth averaged 3.09% per year for oilseeds and 1.22% per year for sugar beet. The yield growth rates for wheat, corn and barley averaged –1.48%, 1.04%, -0.55% per year, respectively, during 1996-2001.

Table 8a—EU Acreage under Major Crops (million acres)

Year	Wheat	Corn	Barley	Oilseeds [a]	Sugar beet
1995	40.92	9.31	27.20	13.95	5.28
1996	41.91	10.31	28.28	13.57	5.00
1997	42.74	10.84	28.85	13.96	5.04
1998	42.67	10.34	28.08	14.79	4.92
1999	42.30	10.26	26.86	14.68	4.85
2000	44.39	10.37	26.62	13.05	4.50
2001	41.53	11.15	26.59	13.00	4.42
1996-2001 Average	42.59	10.55	27.55	13.84	4.79

[a]Oilseeds: rapeseed, sunflower and soybean.

Table 8b—EU Yield for Major Crops (metric ton per acre)

Year	Wheat	Corn	Barley	Oilseeds[a]	Sugar beet
1995	2.144	3.253	1.60	0.854	3.175
1996	2.385	3.440	1.87	0.884	3.554
1997	2.222	3.644	1.82	1.027	3.248
1998	2.432	3.502	1.85	1.035	3.643
1999	2.305	3.646	1.82	1.098	3.508
2000	2.370	3.697	1.94	1.080	3.303
2001	2.214	3.622	1.81	1.029	3.776
1996-2001 Average	2.321	3.592	1.85	1.026	3.505

[a]Oilseeds: rapeseed, sunflower and soybean.
Data Source: European Commission .

Table 7a presents data on total production for cereals, oilseeds, sugar beets and milk. Cereal production has increased from 206.1 to 213.8 million metric tons between 1996 and 2000, but fallen to under 200 million metric tons in 2001. The average annual growth rate during 1996-2001 is –0.61%. Oilseeds production increased by an average of 2.21% per year, but sugar beet production has declined at the rate of 1.25% per year.

During 1996-2001, annual increases in corn acreage and yield together have raised corn output by about 2.6% per year. The decline in wheat production is driven mostly by falling yields. Barley production declined due to reductions in area and yield. In contrast, the decrease in sugar production is largely due to reduced acreage. Growth is sugar yield has offset about 50% of the decline in its acreage. Production increased in the case of oilseeds since yield effects outweighed a modest decline in acreage. For beef and veal, production declined from 7.95 to 7.27 million metric tons (-1.78% per year), while milk production stayed relatively constant (0.14% per year) during 1996-2001.

3.4 INTERVENTION PRICES AND DIRECT PAYMENTS AS A PERCENT OF BORDER PRICES

- Total support for common wheat, corn and barley as a percent of cif price averaged about 34%, 49% and 37% per year, respectively, during 1996-2001.

- The intervention price for sugar inside EU is about two and a half times the fob price. For milk, EU prices average about 111% of the US price.

- The overall pattern indicates prices for all these commodities have been held stable through a combination of intervention prices and direct payments.

Figure 7 presents the annual average intervention price, direct payments and cif Rotterdam prices for common wheat, corn and barley during 1996-2001. The intervention price and direct payments averaged 114.72 and 56.51 euros per ton. The average cif Rotterdam prices are 131.07, 116.74 and 128.12 euros per ton, respectively for common wheat, corn and barley (European Commission).

Figure 7—Average EU Intervention and cif Prices for Major Crops, 1996-2001
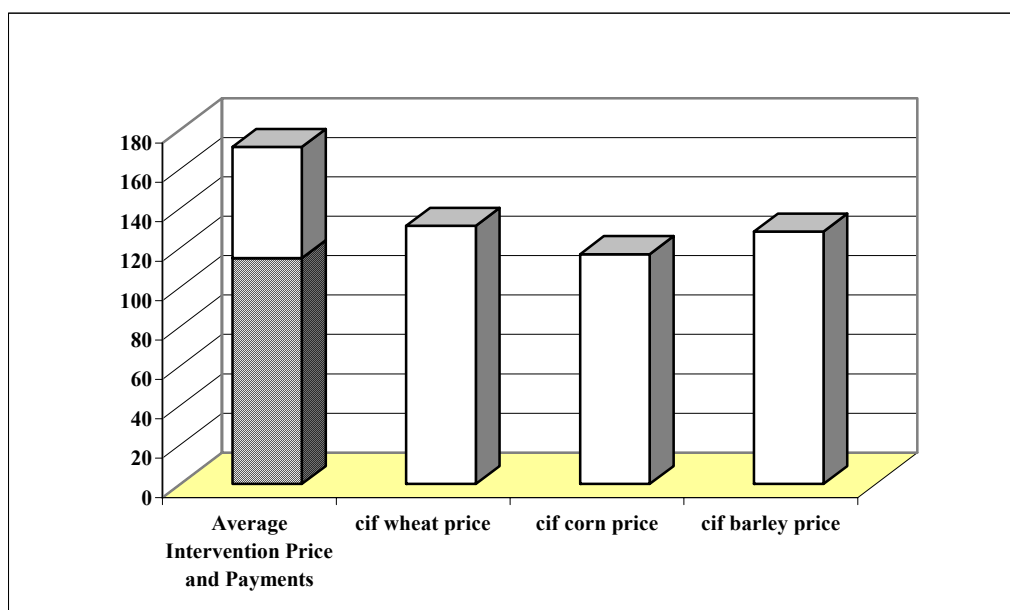
Table 9 presents the trend in EU intervention/target prices for common wheat, corn and barley with respective compensatory payments and border prices. Since the comparison of table 7a with 7b revealed that actual and budgeted direct payments per ton are similar except in the case of the corn, the support levels computed in this section are based on budgeted payments. For sugar and milk, EU intervention and border prices (US price for milk) are presented.

For common wheat, which accounts for a major share of wheat produced in EU, the intervention price and direct payments remained at 119.19 and 54.34 euro per ton, respectively, from 1996 through 1999. While the intervention price has been lowered to 110.25 and 101.31 euro per ton in 2000 and 2001, they are partially offset by higher direct payments of 58.67 and 63 euros per ton, respectively. Most of the cereal production is eligible for direct payments. Hence, it is not clear if the effective price is the sum of intervention price and direct payments.[20] The sum of average intervention price and compensatory payment exceeds the cif Rotterdam price for common wheat in

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[20]This issue is addressed in section V.2.

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every year during 1996-2001. The difference between the sum of support and cif Rotterdam price is lower in high-price years (e.g., 1996), and larger when world market prices fell during 1998-2000. On average over 1996-2001, support price for wheat (sum of intervention price and direct payment) is 34% greater than its cif Rotterdam price.

For corn, the pattern of support and its deviation from cif Rotterdam prices are very similar to that of common wheat. Intervention prices and direct payments for corn and barley are identical to that of wheat. The gap between the sum of support and cif Rotterdam price is narrower in 1996, and has widened since 1997. The annual average support for corn is 49% greater than its cif Rotterdam price during 1996-2001. In the case of barley, support as a percent of cif price averaged 37% per year.

As noted earlier, the sugar sector in the EU operates under a quota-intervention price regime. Figure 8 shows that the intervention price for white sugar inside EU is about two-and-a-half times that of the fob (London exchange) price during 1996-2001. This high support of sugar is not unique to the EU, but similar to that in several other developed countries. Actual production (table 9) exceeded the quota (A and B), which averaged 14.2 million metric tons during 1996-2001. In the dairy sector, intervention prices are set for butter and skimmed milk powder, while milk is supported by target prices. However, quotas at the national level are aimed at regulating production. The average milk price in the EU exceeds that of the US during 1996-2001. Since comparable cif or fob prices are not available, a comparison with the US milk prices is made. On average, EU milk prices exceeded US prices by 11% per year.

Given the significant gap between domestic and international prices, commodity exports from the EU are subsidized. Table 10 presents data on dairy, sugar and beef exports and respective export refunds. The aggregate of all dairy exports is expressed in "milk equivalents," which increased from 40.7 to 44.91 million tons between 1996-2000, before falling to 42.73 million tons in 2001. Export refunds per ton of dairy products declined from 39.43 to 25.91 ECU per ton, but averaged 35 ECU per ton annually during 1996-2001. Exports of sugar, measured in raw sugar equivalents, increased from 6.54 to 8.47 million tons in the same period. However, export refunds declined from 188.03 to 119.05

ECU per ton between 1996 and 2001, with an annual average of 165 ECU per ton. Beef and veal exports have declined dramatically from 1.03 to 0.63 million tons along with export refunds per ton (1519 to 572 ECU per ton) during 1996-2001. While it is hard to compute a price equivalent for the "aggregate" of dairy products, export refunds for sugar clearly form a large share of border prices (see table 9). Similarly, beef refunds account for a significant share of both the intervention (a third) and international prices.

Figure 8—Ratio of EU Intervention and Border prices, and Support Payments for Milk and Sugar
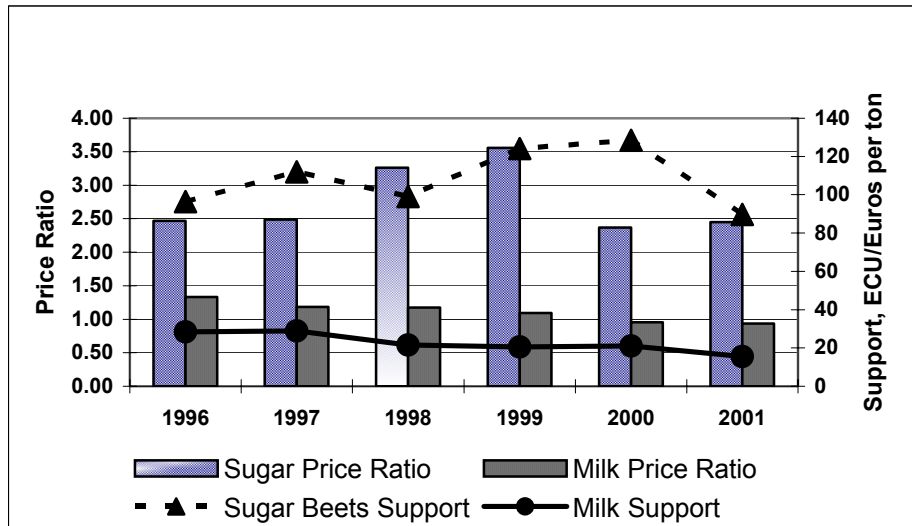
Table 9—EU Prices for Major Crops (ECU/Euro per metric ton)

Commodity	1996	1997	1998	1999	2000	2001	1996-2001 Average
1. Common Wheat							
Intervention Price	119.19	119.19	119.19	119.19	110.25	101.31	114.72
Compensatory Payment	54.34	54.34	54.34	54.34	58.67	63.00	56.51
cif Rotterdam Price	162.39	140.13	112.00	104.24	126.36	141.32	131.07
Support, % of cif Price	6.86	23.84	54.94	66.47	33.68	16.27	33.68
2. Corn							
Intervention Price	119.19	119.19	119.19	119.19	110.25	101.31	114.72
Compensatory Payment	54.34	54.34	54.34	54.34	58.67	63.00	56.51
cif Rotterdam Price	142.57	118.50	104.36	99.00	114.21	121.77	116.74
Support, % of cif Price	21.72	46.44	66.28	75.28	47.90	34.93	48.76
3. Barley							
Intervention Price	119.19	119.19	119.19	119.19	110.25	101.31	114.72
Compensatory Payment	54.34	54.34	54.34	54.34	58.67	63.00	56.51
cif Rotterdam Price	148.19	127.34	104.98	106.64	133.92	147.65	128.12
Support, % of cif Price	17.10	36.27	65.30	62.73	26.14	11.28	36.47
4. White Sugar							
Target Price	665	665	665	665	665	665	665
fob (London Exchange) Price	269.6	267.6	204.1	187.0	281.1	271.5	246.82
Target/fob Price Ratio	2.47	2.49	3.26	3.56	2.37	2.45	2.76
5. Milk							
Milk Target Price	309.8	309.8	309.8	309.8	309.8	309.8	309.80
US Milk Producer Price	232.4	261.2	263.6	283.8	324.4	331.7	282.85
EU/US Price Ratio	1.33	1.19	1.18	1.09	0.95	0.93	1.11
Butter Intervention Price	3282	3282	3282	3282	3282	3282	3282
Skimmed Milk Intervention Price	2055.2	2055.2	2055.2	2055.2	2055.2	2055.2	2055.20

Data Source: European Commission.

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Table 10—CAP Export Refunds for Dairy, Sugar and Beef

Product	1996	1997	1998	1999	2000	2001	1996-2001 Average
1. Dairy - Milk Equivalents							
Exports (million metric ton)	40.70	41.52	40.90	41.80	44.91	42.73	42.09
Export Refunds (million ECU)	1605	1729	1427	1439	1671	1107	1496
Refunds per ton (ECU)	39.43	41.64	34.89	34.42	37.21	25.91	35.59
Refunds per ton ($)	50.08	47.06	39.08	35.80	33.86	23.06	38.16
2. Sugar – Raw Sugar Equivalents							
Exports (million metric ton)	6.54	7.89	8.88	7.80	8.87	8.47	8.08
Export Refunds (million ECU)	1230	1360	1266	1593	1434	1008	1315
Refunds per ton (ECU)	188.03	172.27	142.54	204.28	161.63	119.05	164.63
Refunds per ton ($)	238.8	194.7	159.6	212.5	147.1	106.0	176.43
3. Beef and Veal							
Exports (million metric ton)	1.03	1.06	1.00	0.86	0.81	0.63	0.90
Export Refunds (million ECU)	1559	1498	775	595	661	363	909
Refunds per ton (ECU)	1519	1414	778	689	819	572	965.10
Refunds per ton ($)	1930	1598	871	716	745	509	1061.50

Data Source: European Commission.

3.5   EU DOMESTIC SUPPORT NOTIFICATIONS TO WTO

EU's domestic support notifications to WTO provide a comprehensive view of the various policy instruments. The 1996-1999 (marketing year basis) EU notifications to WTO on domestic support are shown in figure 9:

Figure 9—Components of EU Domestic Support, 1996-1999
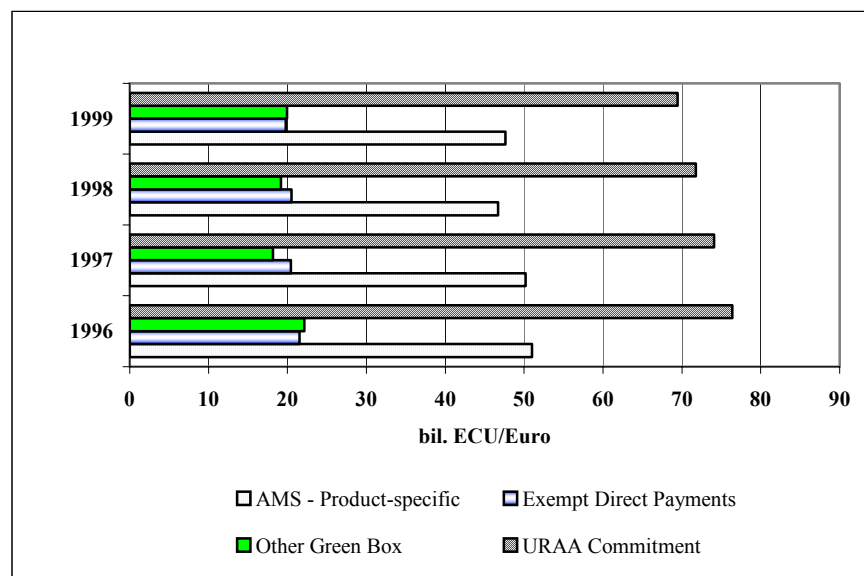
On average over 1996-1999, the product-specific AMS, which is primarily market price support, amounted to 48.88 billion euros. Market price support is estimated by multiplying the difference between intervention and fixed reference (world) prices by the quantity of production eligible for support. Recall that the *de minimis* provision is invoked whenever commodity-specific support is less than 5% of the value of production. Support to minor cereals and some fruits and vegetables have been excluded due to product-specific *de minimis* provision. The non-product specific *de minimis* exemptions (e.g., insurance subsidies, interest concessions) averaged less than 0.5 billion ECU/Euro over 1996-1999.

Direct payments such as compensatory payments to cereal producers including supplementary payments to durum wheat and compensation for set-aside requirements are placed in the blue box exemptions. Oilseed and lentil producers' per hectare compensatory payments, headage payments for beef and veal, and other direct aid to livestock producers (e.g., ewe and goat premiums) are also included in the blue box. These direct payments averaged 20.56 billion ECU per year during 1996-1999. The green box exemptions averaged 19.85 billion euros per year. Its major components are research, structural adjustment, and environmental and rural development programs. During 1996-1999, EU's Uruguay Round commitment on domestic support averaged 72.92 billion euros.

To look at the commodity composition of support, we focus on the latest (1999) WTO notification. Product-specific AMS is estimated as 47.65 billion euros. The major product-specific items included beef (13.09 billion euros), white sugar (5.76 billion euros), butter (4.44 billion euros), common wheat (2.92 billion euros), barley (2.54 billion euros) and olive oil (2.07 billion euros). The non-product-specific items included minor insurance subsidies and interest concessions (0.29 billion euros). Blue box or exempt direct payments are 19.79 billion euros, and the green box support is notified as 19.93 billion euros. Under the URAA, blue and green box payments are not included in the calculation of AMS, which is reported as 47.89 billion euros. Therefore, the 1999 AMS worked out to 69% of the EU's URAA commitment.

3.6   RECENT REFORM EFFORTS: AGENDA 2000, MIDTERM REVIEW AND
        THE BRUSSELS SUMMIT

- Agenda 2000 cut the intervention prices for major crops (cereals, oilseeds) and beef, but increased the compensatory/headage payment rate. Butter and skimmed milk powder prices have been lowered and the sugar regime has been authorized until 2006, when more changes are likely to be introduced.

- The midterm review of the Agenda 2000 has proposed to (i) replace all direct payments by a single income payment per farm, and (ii) limit CAP spending. At the Brussels summit in July 2003, the EU members have agreed to combine all aid to farmers into a single payment to provide production flexibility. Reductions in aid to large farmers will be used to strengthen rural development. However, the EU agricultural budget will remain unchanged until 2013.

- Since 1992, there has been a marked shift from the price support-border protection regime to one that includes price floors and direct payments in major commodities (e.g., cereals, oilseeds, beef and veal). More commodities including dairy products are expected to be placed under the new regime in the next few years. From the viewpoint of developed countries, this is an ongoing shift from coupled policy elements to a mixture of decoupled and coupled policies.

In March 1999, the EU initiated negotiations among members for additional CAP reforms in the context of EU enlargement and the WTO negotiations. Thus emerged Agenda 2000, which involved a deepening of the MacSharry reforms of 1992, for implementation during 2000-2006. Essentially, Agenda 2000 has cut intervention prices, but increased compensatory/headage payments.

As table 9 shows, the cereal support price has been reduced by 15 per cent (18 euro per ton) between 1996 and 2001. The reduction is partially offset by the increase in direct payments of about 9 euro per ton (63 euro per ton). Direct payment to oilseeds producers has been reduced and equalized with the cereals producers. The beef intervention price has been reduced by 20 per cent although the original proposal recommended a 30 percent reduction. As with the case of cereals, direct payments have been increased for beef and veal producers from 163 to 200 euros per head. The supply management limits for cereals (92 tons), and beef and veal (90 animal count) have been retained. As before, large cereal farmers are required to set aside 10% of crop land to be eligible for payments. A proposal to reduce payments by 15% in the dairy sector has been postponed, while butter prices are cut by 10%. At that time, sugar sector has been excluded from the reform package. The Agenda 2000 policy also aimed at capping the

agricultural spending at 40.5 billion euros (constant 1999 prices) per year, excluding guidance expenditures (rural development and other structural measures).

The midterm review of the Agenda 2000 in July 2002 has proposed to replace all direct payments by a single income payment per farm on the basis of historical entitlements. That is, partially decoupled blue box payments would be replaced by fully decoupled green box payments with the aim of reducing economic distortions resulting from domestic farm support policies. While the producer would have full farming flexibility, payments would be conditional on compliance with statutory environmental, food safety, and animal health and welfare standards. In the first stage, the conversion of payments would cover cereals, oilseeds and protein crops, but would be extended to other products over time. There is also a proposal to introduce a system of "dynamic modulation," where all direct payments would be reduced progressively by 3 percent annually so as to achieve a total reduction of 20 percent. The amounts saved would provide additional resources for rural development. A new limit has been set for the total amount that each farmer can receive. After the application of modulation the maximum sum paid to each farm would be 300,000 euros.

At the Brussels Summit in July 2003, the EU members have agreed to further reform CAP based on the midterm review of Agenda 2000. The latest CAP reform maintains the intervention prices but at a lower level for major commodities. However, farmers will be compensated for the lower prices with higher direct payments. Key elements of the new CAP include:

- a single farm payment for EU farmers independent of production, but based on a reference amount in a reference period of 2000 to 2002; payments are linked to the *respect* of environmental, food safety and animal welfare standards;
- farmers who receive more than 5000 euros per year will face a cut in direct payments (3% in 2005, 4% 2006 and 5% in 2007); the estimated savings (1.2 billion euros) will be used to strengthen rural development policy;
- current intervention prices for cereals will be maintained, but the monthly increments will be reduced by half;

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- for beef, EU members have the option of including premiums in the single farm payment or retain a certain percentage of the premium as separate payment;
- dairy payments will be included in the single farm payment beginning in 2008;
- butter prices will be cut by 25% over four years, and the scheduled price reduction of 15% for skimmed milk powder is retained; however, compensation payment per ton has been increased;
- the quota-intervention price regime in sugar is authorized until 2006 only.
- intervention price is cut by 50% for rice, but farmers will receive a higher compensatory payment;
- EU farm budget will not be changed;

In the words of EU Commissioner Franz Fischler, *"Our new policy is trade friendly. We are saying goodbye to the old subsidy system which significantly distorts international trade and harms developing countries…………The ball is in the camp of other countries, such as the US, whose agricultural policies continue to be highly trade-distorting, and have even become increasingly so."* The argument here is that the latest CAP reform strengthens the ongoing shift from coupled to a combination of decoupled and coupled policy instruments. Research on whether or not these changes are partially or fully decoupled, i.e., minimally or do not affect production, prices and trade has just begun, a theme we return to in section V.

4. THE NATURE AND MAGNITUDE OF DOMESTIC SUPPORT IN THE UNITED STATES

Government involvement in US agriculture has a long history, but has been more pronounced since the 1920s. The US farm policy has evolved from New Deal interventions of the mid 1930s towards more reliance on direct payments but still with substantial support.

4.1 BRIEF HISTORY AND BACKGROUND

In the US, the economic boom following World War I subsided in the early 1920s, accompanied by a drastic fall in commodity prices and agricultural exports. The issue of increasing prices to levels before or just after the war remained popular politically. The US Congress approved several versions of the McNary-Haugen bill, which contained provisions to support commodity prices through government procurement. However, the then-President Coolidge vetoed the bills in 1927 and 1928 citing operational difficulties and commodity inequities (Gardner, 2002; Orden, Paarlberg and Roe 1999).[21]

The first significant intervention by the US government in agricultural markets is the establishment of the Grain Stabilization Corporation under the Federal Farm Board in 1930. It aimed to stabilize grain prices (especially wheat), but became quickly defunct. Then came the Depression era and the New Deal policies, which created both short- and long-term interventions in agriculture. Chief among the New Deal policies is the idea of a commodity loan, a short-term measure then, for farmers who placed crops under government storage (Orden, Paarlberg, and Roe, 1999). Farmers could later pay back the loan with cash if prices rose enough to make the sale of their stored crops attractive. If prices did not rise, farmers could simply pay forfeit their crops. Thus emerged the Commodity Credit Corporation (CCC), whose role is to administer the loan and several

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[21]The focus here is on commodity policies and hence, public investments and regulations affecting agriculture are not considered. The latter includes a number of interventions that had direct and indirect effects on agriculture, e.g., irrigation and drainage, research and extension, farm credit, rural development.

other emergency programs. The CCC remains the most important of all US farm policy institutions, and continues to intervene in today's agricultural markets (Gardner, 2002).

The short-term loan program of the Depression era became a permanent subsidy mechanism during World War II. The war and its aftermath (rebuilding Europe) kept the attention away from periodic increases in the loan rates for crops. Simultaneously, price support programs for dairy and sugar emerged with land set-aside requirements to limit supply. Several studies have shown that there has been a sustained increase in the productivity of US agriculture between 1950 and 1970 brought about by technological change (mechanization and biological) and the realization of scale economies. Others have argued that the price assurances along with favorable credit terms may have reduced risk, and enhanced investment and productivity growth in US agriculture (Clarke, 1994). By the early 1970s, as Orden, Paarlberg and Roe (1999) note, farm subsidies had come to be seen by some recipients as part of an underlying social contract, almost the equivalent of property rights.

The Agricultural and Consumer Protection Act of 1973 introduced deficiency payments - difference between market and target prices times the eligible production - to support farm income and stabilize prices. Major field crops except soybeans (wheat, corn, cotton, rice, sorghum, barley and oats) have been supported through deficiency payments. To counter possible expansion in production, especially after 1980, limits have been placed on the quantity of output eligible for subsidies. Each farm had a "payment acreage" and "payment yield" based on its history. The payment acreage had been reduced from 100% to 85%, while the payment yield had been fixed (centered on 1981) during the mid-1980s due to the rise in CCC budgetary outlays and grain stocks. and payment yield. To be eligible for payments, farmers had to set aside a proportion of their cropland, i.e., acreage reduction program (ARP). The payment limits and ARP likely led to the idling of about 70 million acres of cropland in 1983. Dairy and sugar support continued during this period, but as in the case of wheat and corn, payment limits have been applied. Despite these payment limits, between 1965 and 1990 government payments to farmers averaged $10 billion (in 1997 dollars), but in mid-1980s these

payments plus the cost of CCC increased to about $25 billion (Gardner, 2001; US Department of Agriculture, Economic Research Service).

Other forms of support emerged during the 1980s. In the early 1980s, private sector involvement in crop insurance has been given a major push. The muted response from the farming community led to government subsidization of disaster-insurance premiums. In the 1990s, this program has been expanded quantitatively (the premium subsidy increased from 25 to 50%) and qualitatively (product choice - revenue, yield, output insurance). Moreover, the US government reinsured the private companies that provided crop insurance (Gardner, 2001).

The Conservation Reserve Program (CRP) came into existence in 1986, which aimed to idle low productive land and help in soil conservation. Here, farmers submitted bids to the government on the annual rental value and acreage of their low-productive land. The government then chose acceptable bids (rental value and acreage). Farmers with accepted bids then retired the specific parcel of their cropland from production for 10 years, and carried out certain conservation practices. Together with the acreage idling programs, about 60 million acres of cropland have been idled annually between 1987 and 1994. Currently, about 38 million acres are enrolled in CRP (Gardner, 2002).

4.2   THE 1996 FARM BILL (FAIR ACT)

By the mid 1990s a consensus emerged within the US that acreage idling programs had minimal effect on prices, and are largely compensated by expanding acreage in foreign countries. Farmers felt pressured to grow specific crops under government programs, and farm product diversification fell sharply. Moreover, the budget outlays for farm programs increased faster than the overall growth rate in government expenditure. The 1996 Federal Agricultural Improvement and Reform (FAIR) act also referred to as the Agricultural Market Transition (AMT) act eliminated altogether stockpiling and acreage idling, except an expanded conservation program. To provide farmers flexibility in production choices in response to market forces, the FAIR

act replaced also direct government payments by a combination of fixed payments and a "loan deficiency" payment (LDP) program. The risk management programs have been continued, but some are tied to farmers' purchase of disaster insurance. The two major domestic support components of the 1996 farm bill include:

- Fixed payments based on farm history, but not on current acreage and yield;
- Deficiency payments through price floors also referred to as loan rates;

The fixed payments also referred to as PFCs (section II) are based on the history of the farm. Every farm, that had a payment acreage and payment yield under program crops (wheat, corn, rice, cotton and other field crops) prior to 1996, is eligible to receive these fixed payments. To illustrate, consider a farm with 100 payment acres each in wheat, corn, and rice in 1995. These are the same acres for which deficiency payments have been paid in the pre-1996 regime. Suppose payment yields for these crops are 2 tons/acre for wheat, 4 tons/acre for corn and 2 tons/acre for rice (most often, 1980-85 yield average on that specific farm). The fixed payments in 2001 under the FAIR act are set at $17.27 per ton for wheat, $10.63/ton for corn and $46.30/ton for rice. For this farm, the fixed payments for wheat is 85% of the product of payment acreage (100 acres) x payment yield (2 tons) x payment rate ($17.44) = $2936.[22] Similarly, PFCs for corn and rice are 3614 and 7871, respectively. The total PFCS for this sample farm is $14,421. The FAIR act imposed payment limitations of $80,000 per year on three separate farming operations ($40,000 on the first operation and $20,000 each on two additional operations).

The loan deficiency payments or marketing assistance loans worked similar to that of deficiency payments (difference between loan rate and market price). That is, farmers can obtain a loan on their eligible quantity of program crops (loan rate x payment acreage x payment yield). However, instead of forfeiting the commodity (to avoid CCC stockpiling) the farmer is given the option of repaying CCC loans at the "loan repayment

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[22]The payment rate declined for all program crops between 1996 and 2001. The 85% limit is part of the efforts in mid-1980s to reduce output expansion.

rate." This is a price per ton announced each day for each county adjusted daily for movements in market prices relevant to that county. The loan repayment rate will be less than the loan rate so long as market prices are below loan rates, leaving the producer with a "marketing loan gain" (MLG). Alternatively, the farmer can forego the opportunity to put the crop under loan and may obtain a "loan deficiency payment," which equals the difference between loan and loan repayment rate times the quantity eligible for loan. This program existed since mid-1980s with minimal expenditures, but has been used extensively during 1997-2001, since market prices fell below loan rate levels. Annual limit on MLG or LDP continues at $75,000 on the first farm and $37,500 each on two additional operations.

The major midterm change to the 1996 FAIR Act is the introduction of, Emergency Market Loss Assistance or MLA payments. They are not a part of the original 1996 FAIR act, but have been paid to farmers when prices fell during 1997-2001. The MLA payments have been paid to all farmers who had PFCs. The MLA payments in 1998 have been set at 50% of the total PFCs of a farm, and increased to 100% of every year during 1999-2001.

Table 11 presents total CCC actual expenditures for major program commodities - corn, soybeans, wheat, rice and cotton - along with production data for 1996-2001. Unless noted otherwise, the data sources for much of the calculations in tables 11-17 are the Farm Service Agency and the Economic Research Service of the US Department of Agriculture (USDA). The expenditures for corn and wheat include (i) fixed payments referred to as PFCs, (ii) emergency MLA payments, (iii) LDPs, and (iv) MLGs on a marketing-year basis. For rice and cotton, expenditures also include commodity-certificate and user-certificate gains, respectively.[23] Soybean production received LDPs and MLGs only. The production data is total for the US including crops not placed under

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[23]For rice producers facing program payment limits, commodity certificate provides an opportunity to benefit from the lower loan repayment rates. Commodity certificates can be purchased at the prevailing announced world prices. The certificates are available to producers for immediate use in acquiring crop collateral pledged to CCC for a loan. For cotton, user certificates or payments are made to domestic users and exporters of U.S. upland cotton, whenever announced US prices exceed cif Northern Europe prices.

government programs. The share of major crops not placed on government programs is relatively small, since acreage participation rates for these major crops are over 90%.

Expenditure/ton for corn increased from $7.44 in 1996 to $21.67 in 2001, with a peak of $29.6 in the 1999 marketing year (table 11).[24] Soybean production has not received PFCs, but benefits from marketing loans (LDP and MLG) increased from $0.22/ton in 1997 to $43.53/ton in 2001, which is also the peak support in recent years. For wheat, expenditure per ton increased from $31.31 to a peak of $61.16 in 1999, and to $46.40 in 2001. For rice, the expenditure increased from $58.46/ton in 1996 to $153.79/ton in 2001. In the case of cotton, expenditure per ton increased from $170.23 to $440.92 between 1996 and 2001, with a peak of $852.25 again in 1999.

4.2.1   Fixed and Supplemental Payments

- The 1996-2001 average spending on this policy is $9.16 billion.
- Wheat and corn accounted for 42% and 24% respectively of the average spending in 1996-2001.
- Payments to corn more than doubled between 1996 and 2001.

The fixed payments also known as PFCs are made in proportion to what producers had received on average during 1990-1995 or could have received if they had enrolled in the programs available then. However, the PFCs required that land be kept in agriculture, but not used to grow fruits and vegetables. When prices fell in later years (1998-2001), the fixed payments have been supplemented with emergency MLA payments. Figure 10 presents the net expenditures for PFCs during 1996-2001 on a marketing-year basis. Although they are considered as fixed payments and do not tie the farmer to grow a specific crop, they are allocated based on prior production and yield history of farmers. In that sense, there is a crop-specific PFC payment rate, payment-

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[24]Note that expenditure per ton in table 11 does not distinguish between alternative (mutually exclusive) policy choices available to producers (e.g., LDPs or MLGs, but not both). For support measures that account for these alternative choices see tables 15 and 16.

acreage and payment-yield. The supplemental payments are directly related to prices for program crops falling below "certain" historic averages.

Table 11—CCC Actual Expenditure for Major Commodities and US Production, [a] 1996-2002

Year	1996	1997	1998	1999	2000	2001	Average
Corn							
CCC expenditures (mil. $)	1745	3482	5321	7491	7444	5233	5119
Production (mil. Bushels)	9233	9207	9759	9431	9915	9507	9508
Expenditures per bushel ($)	0.19	0.38	0.55	0.79	0.75	0.55	0.54
Production (mil. ton)	235	234	248	240	252	241	242
Expenditures per ton ($)[b]	7.44	14.89	21.47	31.27	29.56	21.67	21.05
Soybeans							
CCC expenditures (mil. $)	0	16	1220	2323	2502	3425	1581
Production (mil. Bushels)	2380	2689	2741	2654	2758	2891	2686
Expenditures per bushel ($)	0.00	0.01	0.45	0.88	0.91	1.18	0.57
Production (mil. ton)	64.8	73.2	74.6	72.2	75.1	78.7	73.10
Expenditures per ton ($)	0.0	0.22	16.35	32.17	33.33	43.53	20.93
Wheat							
CCC expenditures (mil. $)	1940	1412	2717	3827	3593	2472	2660
Production (mil. Bushels)	2277	2482	2547	2299	2233	1958	2299
Expenditures per bushel ($)	0.85	0.57	1.07	1.66	1.61	1.26	1.17
Production (mil. ton)	62.0	67.5	69.3	62.6	60.8	53.3	62.58
Expenditures per ton ($)	31.31	20.91	39.19	61.16	59.14	46.40	43.02
Rice							
CCC expenditures (mil. $)	455	448	729	1331	1495	1463	987
Production (mil. Cwt)	172	183	184	206	191	210	191
Expenditures per cwt ($)	2.65	2.45	3.95	6.46	7.83	6.98	5.05
Production (mil. ton)	7.8	8.3	8.4	9.3	8.7	9.5	8.67
Expenditures per ton ($)	58.46	53.99	87.18	142.4	172.7	153.8	111.42
Cotton							
CCC expenditures (mil. $)	702	1016	1794	3149	1626	1949	1706
Production (mil. Bales)	18.9	18.8	13.9	17.0	17.2	20.3	17.68
Expenditures per bale ($)	37.06	54.06	128.91	185.56	94.58	96.00	99.36
Production (mil. ton)	4.12	4.1	3.0	3.7	3.7	4.4	3.84
Expenditures per ton ($)	170.2	248.3	592.1	852.3	434.4	440.9	456.37

[a]Expenditure under PFC, MLA, LDP and MLG for corn, wheat, rice and soybeans. For cotton, the expenditures include all the above programs and user-certificate payments. All computations are made on a marketing-year basis.
[b]Corn – 56 pounds per bushel; Wheat and Soybeans – 60 pounds per bushel; Rice – 100 pounds per cwt; Cotton – 480 pounds per bale.
Data Source: US Department of Agriculture, Farm Service Agency.

Over $55 billion have been paid to farmers in the form of PFCs and MLA payments cumulatively from 1996-2001. Of this corn and wheat production received about $23 billion and $13 billion, respectively. With approximately 242 million tons of corn produced per year during 1996-2001, the corn PFCs and MLA payments averaged about $15.93 per ton of US corn production during the same time. Similarly, wheat PFCs and MLA payments averaged $36.08 for every ton of wheat produced in the US during 1996-2001. Calculations for rice and cotton for the same duration showed that payments averaged $80.62 for every ton of US rice production and $245.57 for every ton of US cotton production. The total expenditures under PFCs and MLA payments peaked in 1999 or 2000, but showed a declining trend thereafter due to lower supplemental payments in 2001 and the introduction of the new farm bill in 2002.

Figure 10—US fixed and Supplemental Payments, 1996-2001
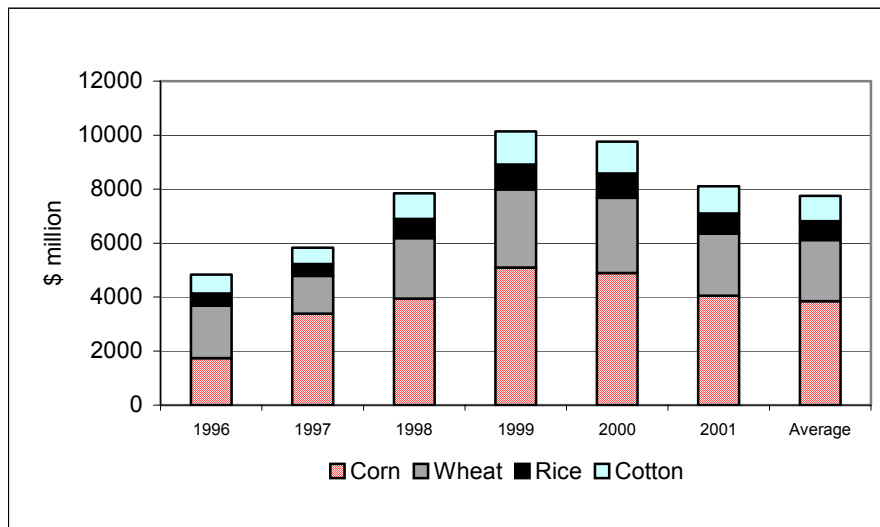

4.2.2   Loan Deficiency Payments and Marketing Loan Gains

- Average spending on LDPs during 1998-2001 is $5.25 billion.
- Soybeans and corn accounted for 39% and 30%, respectively, of the average spending in 1998-2001.

- Payments to soybeans more than tripled between 1998 and 2001. Cotton payments also doubled during the same time.

Figure 11 presents the LDPs by crop for 1998-2001. The LDPs during 1996-1997 are either zero or insignificant. Of the $21 billion spent on LDPs, about $6.4 billion went to corn and another $8.3 billion to soybeans. For wheat, rice and cotton, LDPs are lower relative to that paid out to corn and soybeans.

Figure 11—US Loan Deficiency Payments for Major Crops, 1998-2001
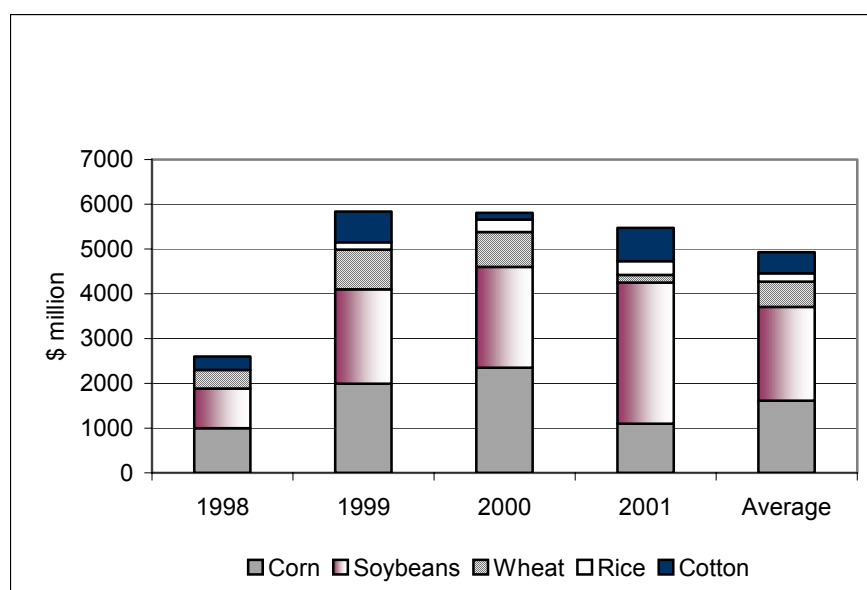
The LDP benefits on a per unit basis can be derived using total production data from table 11 and the payments. The payments on a per unit basis are calculated under the assumption that all production is placed under the LDP program (table 15). Corn LDPs paid out $4/ton in 1998, which increased to $9.3/ton in 2000 and returned to $4.5 in 2001. For wheat, LDPs ranged from a high of $14.2/ton in 1999 to $3.2/ton in 2001. Soybeans witnessed continual increases in LDPs from $11.8/ton in 1998 to $40.1/ton in 2001. Similarly, rice LDPs per ton increased from $0.1/ton in 1998 to $32.3/ton in 2001. In the case of cotton, LDPs fell from a peak of $185/ton in 1999 to $168.5/ton in 2001.

Recall that farmers can choose to receive either LDPs or MLGs, but not both. Marketing loan gains during 1998-2001 are presented in figure 12. Rice MLGs have increased from $13 million to over $198 million, while those of soybeans stayed relatively stable (annual average of $270 million). Corn MLGs show a distinct declining trend, while cotton MLGs peaked in 1999 and have since become negligible. The per unit MLGs are presented in table 12. For corn and wheat, MLGs per ton averaged less than a dollar per year during 1996-2001. The MLG/ton for soybeans averaged $2.44/year. Rice and cotton had the largest MLG per ton relative to the other commodities. They respectively averaged $9.89/year and 53.15/year during 1996-2001. Total MLGs averaged less than $1 billion during 1998-2001 compared to the $5 billion average LDPs, suggesting that most farmers preferred the latter instrument.

Figure 12—US Marketing Loan Gains, 1998-2001
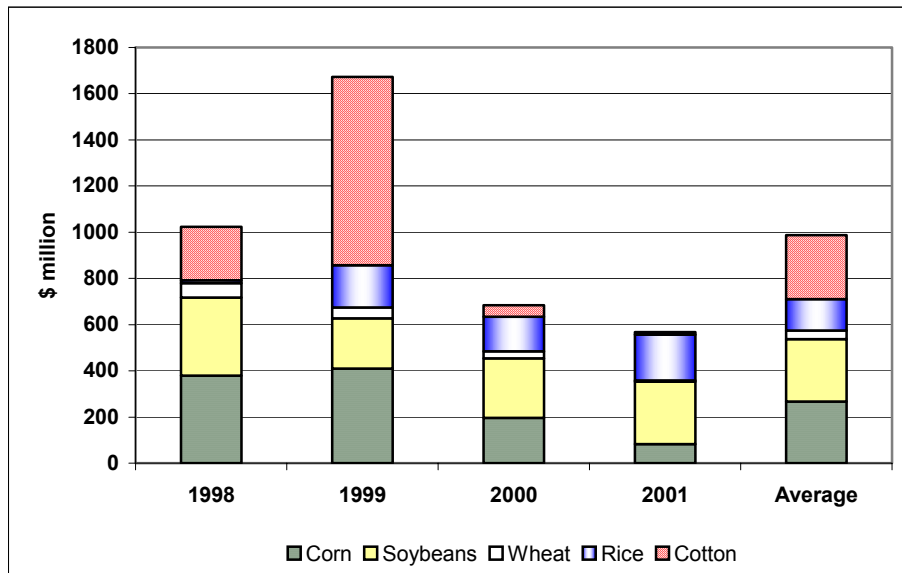
Table 12—US Department of Agriculture, 2002 and 2003 Budgets (Million $)

Item	2001	2002	2003 Proposed Allocation
Commodity Programs	30,044	22,284	17,208
Farm Loan and Grants Program	3,406	3,694	3,806
Farm Bill Legislation	0	4,640	7,825
Conservation Programs	1,757	1,817	1,968
Export Programs			
Export Credit Guarantees	3,227	3,926	4,225
Export Subsidy	15	539	541
Others	1,205	1,334	1,465
Crop Insurance Fund	3,133	2,955	2,825
Marketing and Regulatory Programs	1,475	1,424	1.385
Federal Research Funding	2,405	2,529	2,329
Natural Resources and Environment (excluding Forest Service)	1,492	1,239	1,260
Administrative and Other Expenses	3,347	3,882	4,728
Total	51,506	50,263	48,181

Source: US Department of Agriculture.

4.2.3   Other Programs

- Market price support for dairy averaged $4.459 billion per year during 1996-2001.
- Market price support for sugar averaged $1.07 billion per year during 1996-2001.
- Dairy support showed a marginally declining trend.

The above and other commodity programs accounted for a larger share of expenditures in USDA's budget. Table 12 with the USDA budget shows the support

extended for various programs including commodity programs, research and development, conservation reserve, risk management and other programs.[25]

A number of significant programs exist for other farm products, among which support for dairy and sugar stand out.[26] The CCC's commodity budgets do not include these payments directly, since they are not necessarily paid in cash to farmers. The dairy industry has a market price support program using fixed reference prices, which are protected by import barriers. Market price support under this program is presented in table 13 for 1996-2001, along with data on production and support prices. Price support is total eligible production times the difference between the current administered prices and the fixed, 1986-1988 world reference price. The administered price is about $218/ton during the 1996 FAIR act with a ceiling on eligible quantity (about 1080 tons per operation). The price support program has been originally scheduled for elimination in 1999, but has been renewed for 2000 and 2001. Given the production data, it appears that price support on per ton basis has averaged about $61.32 during 1996-2001.

The value of the sugar price support, computed in a way similar to that of dairy, is presented also in table 13. About a billion dollars accrue to the sugar industry due to the market price support, which is shielded from import competition with high tariffs. The US raw sugar price (cane and beet combined) is on average about two times that of the world raw sugar. However, estimated price support for raw sugar stayed relatively constant at $130 per short ton between 1996 and 2001.

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[25]In addition to the items on table 12, the 2002 USDA's budget included (i) Food Stamp, and National School Lunch programs is worth $39 billion, and (ii) the rural development and forest service accounted for $15 and $5 billion, respectively.

[26]The final bound tariff rate for fluid milk and cream is about 130%, while those on milk powder and cheese are set at 40% and 27%, respectively. For raw cane and beet sugar, the bound rate on tariff is 92%, and for refined sugar the rate is 58%.

Table 13—US Dairy and Sugar Support Programs, 1996-2001

	1996	1997	1998	1999	2000	2001	Average
Dairy							
Milk Production, million tons	69.86	70.80	71.37	73.81	76.00	75.07	72.82
Dairy Price Support Estimate* (mil. $)	4673	4455	4332	4437	4376	4483	4459
Price support, $/ton	66.89	62.92	60.70	60.12	57.58	59.72	61.32
Administered Price, $/ton	218	218	218	218	218	218	218
Sugar							
Raw Sugar Production (Beet and Cane), mil. short tons	7.20	8.02	8.37	9.03	8.77	7.91	8.22
Sugar Price Support Estimate* (mil $)	937	1045	1093	1180	1132	1032	1070
Sugar Price Support, $/short ton	130.1	130.3	130.6	130.6	129.1	130.5	130.2
US Raw Sugar Price, $/short ton	448.0	439.2	441.2	423.2	381.8	422.2	425.93
World Raw Sugar Price, $/short ton	244.8	241.2	193.6	130.8	170.2	182.4	193.83
Ratio of US/World Price	1.83	1.82	2.28	3.24	2.24	2.31	2.29

*Price support is total eligible production times the difference between the current administered prices and the fixed, 1986-1988 world reference price.
Data Source: US Department of Agriculture, Farm Service Agency and Economic Research Service.

4.3   PRODUCTION, ACREAGE AND YIELD OF MAJOR COMMODITIES, 1996-2001

- Acreage under corn and soybean has increased, while that under wheat had fallen during the 1990s. Acreage under rice and cotton has remained stable.

- Yield for these five major crops have grown significantly during the 1990s.

- Soybeans production increased the most during 1996-2001 (4% per year), followed by that of rice and cotton (3% per year). Wheat production recorded a significantly negative growth rate.

The changes in planted US acreage of major crops -corn, soybeans, wheat, rice, and cotton- between 1995 and 1996 and for 1995-2001 are presented in table 14a. Acreage in corn and soybeans has grown significantly since 1995, with the most striking change appearing between 1995 and 1996.[27] While rice and cotton acreage held steady, soybeans and corn gained acreage at the expense of wheat. Comparing the 1991-1995 average acreage with that of 1996-2001, corn, soybeans and cotton gained a total of 14 million acres, while wheat lost about 4 million acres.

Yields of major crops witnessed also significant changes between 1991-1995 and 1996-2001 (table 14b). The US corn yield had the largest improvement followed by wheat, soybeans, rice and cotton in that order. Together, acreage and yield increases, have led to significant increases in soybeans output of about 4% per year between 1996-2001. Rice and cotton output expanded by an average of 3% per year during the same period, while growth in corn output averaged only about 0.7% per year. Wheat recorded a negative growth in output, falling by an average of 2.7% per year and showing significant decrease in output during 1999-2001.

As noted before, US dairy production increased between 1996-2000 with a marginal decline in 2001 (table 13). Sugar production increased between 1996-1999 and has fallen in 2000 and 2001. Although not presented in that table, yield per cow for milk, and raw sugar (equivalent) yield per acre for beet and cane sugar have increased as well. The rate of growth in sugar and milk production averaged about 1% during 1996-2001.

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[27]Acreage idled under government programs fell from about 55 to 35 million acres between 1995 and 1996 (Gardner, 2002; U.S. Department of Agriculture, Economic Research Service). In addition, the FAIR Act's planting flexibility provision allowed shfiting base acres among program crops.

Table 14a—US Acreage Under Major Crops (million acres), 1995-2001

Year	Corn	Soybeans	Wheat	Rice	Cotton
1995	72	63	69	3.1	16
1996	79	64	75	2.8	15
1997	80	70	70	3.1	14
1998	80	72	65	3.3	13
1999	77	73	63	3.5	15
2000	80	74	63	3.1	16
2001	76	74	60	3.3	16
1995-96 Change in Acreage	**7**	**1**	**6**	**-0.3**	**-1**
1991-1995 Average	76	61	70	3.2	14
1996-2001 Average	79	71	66	3.2	15

Source: US Department of Agriculture, Economic Research Service.

Table 14b—US Yield for Major Crops (per acre), 1995-2001

Year	Corn (tons)	Soybeans (tons)	Wheat (tons)	Rice (tons)	Cotton (tons)
1995	2.88	0.96	0.97	2.55	0.24
1996	3.23	1.02	0.99	2.78	0.32
1997	3.22	1.06	1.08	2.68	0.31
1998	3.41	1.06	1.18	2.57	0.28
1999	3.40	1.00	1.16	2.66	0.28
2000	3.48	1.04	1.14	2.85	0.29
2001	3.51	1.08	1.09	2.89	0.32
1991-1995 Average	3.01	0.99	1.01	2.63	0.29
1996-2001 Average	3.38	1.04	1.11	2.73	0.30

Source: US Department of Agriculture, Economic Research Service.

4.4   SUPPORT AS A PERCENT OF FARM AND FOB PRICES

- During the early years of FAIR act, the majority of support has been through fixed payments.

- Total support as a percent of farm price during 1996-2001 averaged 26.1% for corn, 11.1% for soybeans, 41.4% for wheat, 76.6% for rice, and 36.7% for cotton.

- Total support as a percent of fob price during 1996-2001 averaged 21.7% for corn, 9.5% for soybeans, 33.5% for wheat, 63.9% for rice, and 33.3% for cotton.

- The overall pattern indicates raising support since 1996 with its peak in either 1999 or 2000, followed by some modest reductions in 2001.

Figure 13 presents domestic support by policy for the major commodities during 1998-2001, except cotton. Since support payments per ton of cotton are several times larger than those for other crops, they are not included in figure 13. For the case of corn, LDPs/MLGs and MLA payments together accounted for over 50% of the total support, while the rest is from PFCs. For soybeans, LDPs/MLGs is the only form of support. In the case of wheat, rice and cotton, the share of LDPs and MLA payments is over 55% of the total support during 1998-2001.

Table 15 presents prices received by farmers and total payments under the support policies. For corn and wheat, the major support policies are PFCs, LDPs/MLGs and MLA payments. As noted before, soybeans received LDPs or MLGs, while rice and cotton received PFCs, MLA payments, LDPs/MLGs and certificate gains. Note that the computation of all support in table 15 excluded MLGs since farmers received either LDPs or MLGs, but not both. Moreover, it appears from expenditures that a majority of farmers preferred LDPs over MLGs. Revenue from various support policies as percent of farm price for corn, soybeans, wheat, rice and cotton is also presented. The overall pattern indicates raising support since 1996 with its peak in either 1999 or 2000, followed by some modest reductions in 2001.

Figure 13—US Support by Policy in Major Crops, 1998-2001 Average
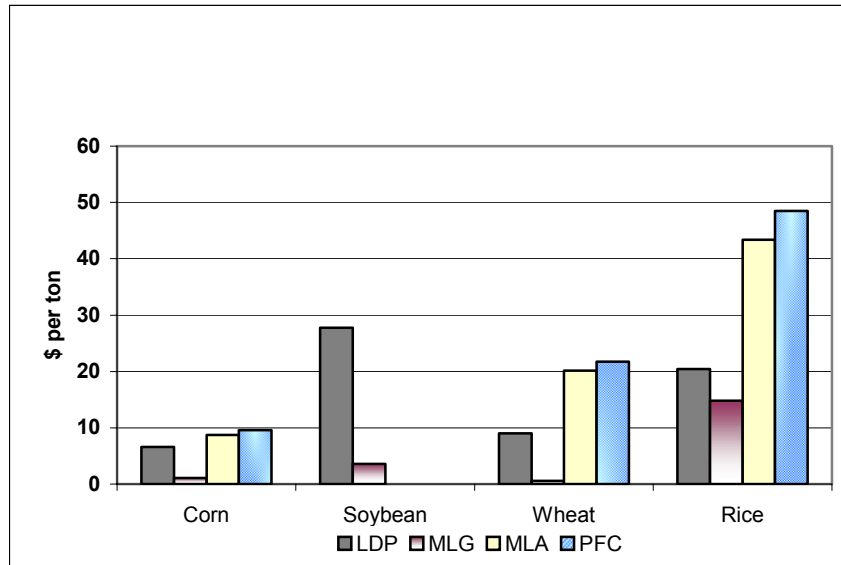
For corn all payments are about 7% ($7.44/ton) of the farm price in 1996, which grew to about 41.26% in 1999 ($29.56/ton) and has declined to 27.5% in 2001 ($21.33/ton). At the peak, support as a percent of farm price is about 6 times that of the 1996 levels, while the 2001 support is about 4 times the 1996 base. For soybeans, LDPs as a percent of the farm price increased from about 6.5% ($11.83/ton) to over 25% ($40.09/ton) between 1998 and 2001. In the case of wheat, all support payments per ton increased from $31.3 in 1996 to $60.4 in 1999, and $46.3 in 2001. As a percent of farm price, support levels in 1999 and 2001 are slightly more than 3 and 2 times that of 1996 levels (table 15).

Table 15—US Domestic support on per unit basis, 1996-2001

	1996	1997	1998	1999	2000	2001	Average
Corn							
Farm Price	106.69	95.66	76.37	71.65	72.83	77.56	83.46
PFC/ton	7.44	14.47	10.62	10.63	9.33	7.85	10.06
MLA/ton	0.00	0.00	5.28	10.62	10.10	8.93	5.82
LDP/ton	0.00	0.00	4.04	8.31	9.34	4.55	4.37
MLG/ton	0.00	0.42	1.53	1.71	0.78	0.34	0.80
% Farm Price							
LDP	0.00	0.00	5.29	11.60	12.82	5.87	5.93
LDP+MLA	0.00	0.00	12.20	26.43	26.70	17.38	13.78
MLG+MLA	0.00	0.44	8.91	17.21	14.95	11.96	8.91
All Support*	6.97	15.12	26.10	41.26	39.51	27.50	26.08
Soybeans							
Farm Price	270.07	237.73	181.15	170.12	166.82	159.84	197.62
PFC/ton	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MLA/ton	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LDP/ton	0.00	0.00	11.83	29.15	29.91	40.09	18.50
MLG/ton	0.00	0.22	4.52	3.01	3.42	3.44	2.44
% Farm Price							
LDP	0.00	0.00	6.53	17.14	17.93	25.08	11.11
LDP+MLA	0.00	0.00	6.53	17.14	17.93	25.08	11.11
MLG+MLA	0.00	0.09	2.50	1.77	2.05	2.15	1.43
All Support*	0.00	0.00	6.53	17.14	17.93	25.08	11.11
Wheat							
Farm Price	158.00	124.19	97.37	91.12	96.27	102.15	111.52
PFC/ton	31.31	20.68	21.58	23.10	22.01	20.20	23.15
MLA/ton	0.00	0.00	10.74	23.10	23.77	22.96	13.43
LDP/ton	0.00	0.00	5.96	14.21	12.85	3.15	6.03
MLG/ton	0.00	0.23	0.90	0.76	0.50	0.09	0.41
% Farm Price							
LDP	0.00	0.00	6.13	15.59	13.35	3.08	6.36
LDP+MLA	0.00	0.00	17.16	40.94	38.05	25.56	20.28
MLG+MLA	0.00	0.19	11.96	26.18	25.21	22.57	14.35
All Support*	19.81	16.65	39.32	66.29	60.91	45.33	41.39

Table 15—US Domestic support on per unit basis, 1996-2001---continued

	1996	1997	1998	1999	2000	2001	Average
Rice							
Farm Price	219.58	213.85	195.99	130.73	123.68	91.93	162.63
PFC/ton	58.46	53.99	57.08	49.80	50.03	37.04	51.06
MLA/ton	0.00	0.00	28.44	49.70	53.57	41.80	28.92
LDP/ton	0.00	0.00	0.12	17.19	32.07	32.42	13.63
MLG/ton	0.00	0.00	1.56	19.57	17.36	20.86	9.89
% Farm Price							
LDP	0.00	0.00	0.06	13.15	25.93	35.26	12.40
LDP+MLA	0.00	0.00	14.57	51.17	69.24	80.73	35.95
MLG+MLA	0.00	0.00	15.31	52.99	57.35	68.17	32.30
All Support*	26.62	25.25	43.69	93.96	125.57	144.60	76.61
Cotton							
Farm Price	1554.24	1459.45	1360.24	1031.75	1137.57	773.81	1219.51
PFC/ton	169.43	145.90	210.15	166.18	153.63	107.12	158.73
MLA/ton	0.00	0.00	104.34	166.02	163.73	118.50	92.10
LDP/ton	0.00	0.67	100.11	185.37	40.57	168.29	82.50
MLG/ton	0.00	6.38	75.99	220.56	13.37	2.60	53.15
% Farm Price							
LDP	0.00	0.05	7.36	17.97	3.57	21.75	8.45
LDP+MLA	0.00	0.05	15.03	34.06	17.96	37.06	17.36
MLG+MLA	0.00	0.44	13.26	37.47	15.57	15.65	13.73
All Support*	10.95	16.58	37.94	61.22	37.01	56.64	36.72

*All Support includes PFC, LDP, MLA and certificate gains (rice and cotton). MLG was not included since farmers get either LDP or MLG.
Farm prices are from US Department of Agriculture, Farm Service Agency; Economic Research Service.

Payments to rice have increased the most from government programs, both in terms of value and as a percent of farm price during 1996-2001. All support payments (less MLGs) in 1996 was $58.5/ton, which increased to $155.3 in 2000, before falling to $132.9 in 2001. All support as a percent of rice (farm) price increased from 26.6% in 1996 to over 144.6% in 2001. All support payments for cotton increased from $170.23/ton to $631.68/ton between 1996 and 1999, and it is $438.3/ton in 2001. Support payments per ton for cotton in the form of PFCs, MLA payments LDPs, and MLGs averaged $158.73, $92.10, $82.50 and $53.15, respectively, during 1996-2001. Again, as a percent of farm price, support increased from about 11% to 56.6% during 1996-2001.

The producer support estimates (PSE) of the Organization for Economic Cooperation and Development (OECD) are based on farm prices as well. However, OECD's PSEs are based on market price support and some of the payments based on output (e.g., LDPs). The classification of payments by OECD is different than the policy-based numbers presented in this study. However, the nominal assistance coefficients of OECD are, on average, similar to the figures in table 15.

Table 16 presents the fob prices (cif price in the case of cotton), and all support for each of these commodities. In general, fob prices (US Gulf for corn, wheat and soybeans, US Houston for rice, and cif Northern Europe for cotton) are larger than the farm prices, incorporating marketing, transportation and other costs (Economic Research Service, USDA). All support as a percent of fob price of corn increased from 6.2% to 23.1% during 1996-2001. The upward trend is also reflected in the support for soybeans (0% to 21.6%), wheat (15.1% to 37.3%), rice (21.7% to 110.3%) and cotton (9.8% to 47.5%). For the case of raw sugar, the US price is on average 229% of the world price, while dairy price support accounted for about 28% of the reference price during 1996-2001 (table 13).

Table 16—US Support Payments ($) as a Percent of fob Prices ($/ton)

|	1996	1997	1998	1999	2000	2001	Average
Corn							
fob price	120.86	109.44	92.52	87.79	88.18	92.52	98.55
All Support*	7.44	14.47	19.94	29.56	28.77	21.33	20.25
% of fob Price							
LDP	0.00	0.00	4.37	9.47	10.59	4.92	4.89
LDP+MLA	0.00	0.00	10.07	21.57	22.05	14.57	11.38
MLG+MLA	0.00	0.38	7.36	14.04	12.34	10.02	7.36
All Support*	6.16	13.22	21.55	33.67	32.63	23.05	21.71
Soybeans							
fob price	283.14	296.0	252.31	194.40	191.19	185.49	233.76
All Support*	0.00	0.00	11.83	29.15	29.91	40.09	18.50
% of fob Price							
LDP	0.00	0.00	4.69	15.00	15.64	21.61	9.49
LDP+MLA	0.00	0.00	4.69	15.00	15.64	21.61	9.49
MLG+MLA	0.00	0.07	1.79	1.55	1.79	1.85	1.18
All Support*	0.00	0.00	4.69	15.00	15.64	21.61	9.49
Wheat							
fob price	207.02	159.96	126.34	111.58	114.36	124.0	140.54
All Support*	31.31	20.68	38.29	60.40	58.64	46.31	42.60
% of fob Price							
LDP	0.00	0.00	4.72	12.73	11.24	2.54	5.21
LDP+MLA	0.00	0.00	13.22	33.43	32.03	21.06	16.62
MLG+MLA	0.00	0.15	9.21	21.38	21.22	18.59	11.76
All Support*	15.12	12.93	30.30	54.13	51.27	37.34	33.52
Rice							
fob price	269.16	308.42	267.69	164.95	121.91	120.47	208.77
All Support*	58.46	53.99	85.62	122.84	155.30	132.93	101.52
% of fob Price							
LDP	0.00	0.00	0.05	10.42	26.31	26.91	10.61
LDP+MLA	0.00	0.00	10.67	40.56	70.25	61.61	30.51
MLG+MLA	0.00	0.00	11.21	42.00	58.18	52.02	27.23
All Support*	21.72	17.50	31.98	74.47	127.38	110.34	63.90
Cotton							
cif price	1733.70	1589.30	1299.70	1164.80	1261.80	923.0	1328.72
All Support*	170.23	241.93	516.08	631.68	421.02	438.32	403.21
% of fob Price							
LDP	0.00	0.04	7.70	15.91	3.22	18.23	7.52
LDP+MLA	0.00	0.04	15.73	30.17	16.19	31.07	15.53
MLG+MLA	0.00	0.40	13.87	33.19	14.04	13.12	12.44
All Support*	9.82	15.22	39.71	54.23	33.37	47.49	33.31

*All Support includes PFC, LDP, MLA and certificate gains (rice and cotton). MLG was not included since farmers get either LDP or MLG.

Fob prices are from US Department of Agriculture, Economic Research Service.

4.5   US DOMESTIC SUPPORT NOTIFICATIONS TO WTO

Domestic support notifications to WTO provide a comprehensive view of the various US policy instruments. The 1996-1999 (marketing year basis) US notifications to WTO on domestic support are shown in figure 14:

Figure 14—Components of US Domestic Support, 1996-1999
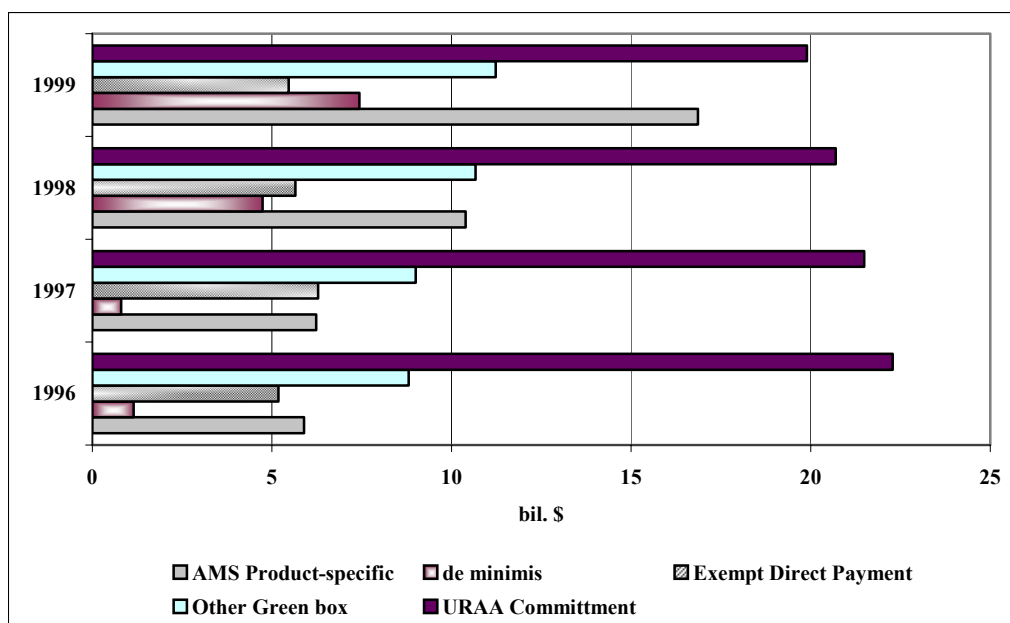
On average over 1996-1999, the product-specific aggregate measure of support (AMS), which is primarily market price support, amounted to $9.85 billion. It is estimated by multiplying the difference between intervention and reference (world) prices and the quantity of production. The nonproduct-specific *de minimis* provision is invoked for MLA payments and crop insurance, which averaged $3.53 billion per year. The PFCs averaged $5.65 billion per year during 1996-1999 and have been placed in the green box since they are considered to be minimally trade-distorting support. Other green box support, which included research, structural adjustment and rural development assistance, averaged $.9.93 billion per year. During 1996-1999, Uruguay Round commitment on US domestic support averaged $21.1 billion per year.

The 1999 US domestic support notification to WTO shows that the amber box or product-specific items amounted to 16.86 billion. It includes dairy price supports ($4.44 billion), LDP and marketing loan gains ($8.07 billion), sugar support ($1.18 billion) and other smaller programs. The nonproduct-specific *de minimis* items include MLA payments ($5.47 billion), crop insurance program values ($1.51 billion), and input subsidies ($0.44 billion). The PFCs, and other green box support (excluding domestic food aid) for 1999 are $5.47 billion and $11.23 billion, respectively. In 1999, the amber box actual ($16.86 billion) is lower than the US commitment on AMS ($19.90 billion).

4.6   THE 2002 FARM BILL (FSRI ACT)

The 2002 US farm bill, Farm Security and Rural Investment (FSRI) Act, carries forward several policies of the FAIR act without substantial changes (Eidman, 2002). The major components of the 2002 farm bill are similar to that of the 1996 farm bill.

- Fixed payments based on farm history, but not on current acreage and yield. However, farmers can update acreage and yield prior to the implementation of this farm bill. Commodity list is extended to other oilseeds (e.g., soybeans).

- Deficiency payments through price floors also referred to as loan rates. The list of commodities eligible had been expanded to be consistent with that of the fixed payments.

- Counter-cyclical payments with target prices (well above price floors) are set for most crops.

The PFCs are referred to as fixed payments, but have been expanded to include soybeans, other oilseeds and peanuts (table 17). The direct payment rates for the program commodities are similar to the 2001 rates in the FAIR act. Payment acreage is to be determined using two options (Orden, 2003). The first is to set base acres for a commodity equal to those in FAIR Act for 2002 PFC payment. In this option, oilseed acres during 1998-2001 can be added to the base so long as the total base acres do not exceed available cropland of a farm. The second option is to update base acres to reflect the 1998-2001 average planted acres, plus those prevented from planting due to

conditions beyond the control of the farmer (e.g., drought). The option chosen here is to be applied to direct and supplemental (counter-cyclical) payments for program crops.

Marketing assistance loan rates are set for major crops and this instrument has been extended to peanuts, wool, mohair and honey. Farmers continue to have the option of taking out a loan and repaying it at a lower rate (marketing loan gain) or accept LDPs. The loan rates for wheat and other field crops have been increased, while that of soybeans is lowered in the 2002 farm bill (table 17).

What has been emergency MLA payments in the late 1990s has become a legislated policy instrument under the 2002 farm bill. The counter-cyclical income support payments (CCP) are available for wheat, feed grains, rice, cotton, soybeans, minor oilseeds, and peanuts. Target prices are set for each of these crops and payments are computed as follows:

CCP rate = [target price – direct payment rate – (the higher of the commodity price or loan rate)]

Payment acreage is chosen using one of the two options outlined earlier for the PFC/direct payments. If farmers chose the second option, i.e., updating base acres to reflect 1998-2001 plantings, payment yield can be updated as well for the counter-cyclical payments. The target prices serve as the final price for producers of these program crops. As table 17 shows, the gap between target prices and loan rates (after subtracting direct payment rates) is fairly large. Notice that in all cases except wheat and rice, the target prices exceed the 2001 farm price plus all support payments (PFCs, LDPs, MLGs and MLA payments) in table 15.

Table 17—US Direct Payment Rates and Loan Rates under FAIR (1996) and FSRI (2002) Acts

Commodity	1996 FAIR Act		2002 FSRI Act		
	Direct Payment Rate[a]	Loan Rate	Direct Payment Rate	Loan Rate 2002-2003	Target Price 2002-2003
Corn ($/ton)	10.63	74.41	11.02	77.95	102.36
Soybeans ($/ton)	0.00	193.27	16.17	183.72	213.11
Wheat ($/ton)	17.27	94.80	19.11	102.88	141.83
Rice ($/ton)	46.30	143.30	51.81	143.30	231.48
Cotton ($/ton)	132.28	1146.39	154.32	1146.39	1596.13
Sorghum ($/ton)	14.70	78.54	16.08	90.94	116.66
Barley ($/ton)	9.65	75.78	11.02	86.35	101.50

[a]Rates for 2001-2002.
Source: US Department of Agriculture, Farm Service Agency and Economic Research Service; Eidman (2002).

The total cost of the commodity-side of the 2002 farm bill is expected to be $190 billion during 2002-2011 (10 years). Annually, support under these commodity programs is anticipated in the neighborhood of $19 billion. With favorable price scenarios for the later part of the farm bill, much of the spending is anticipated in the early years. (2002-2007). Note that these figures are exclusively for commodity programs, and do not include other expenditures outlined in table 12 (USDA budget).

With regard to other programs, the price supports for dairy are continued at about $218 per ton (the same as in the FAIR act), and a counter-cyclical payment (income support) program has been introduced. Sugar market price support program has been continued as well. It appears that the $19 billion support limit does not include estimates of market price support for dairy and sugar, which are anticipated to be about the same or more as in table 13. Effectively, the trade policies (high tariffs) continue to isolate the US dairy, sugar and peanut markets from the rest of the world.

The 1996 farm bill initially had a two-tiered price and income support, but the decline in prices in 1998 led to additional support (MLA payments). The placement of

MLA payments in the nonproduct-specific *de minimis* provision rather than the amber or green box suggests some ambiguity on its effects on production and trade. The 2002 farm bill has continued the price and income support, but in three tiers: direct payments, loan rates with deficiency payments and target prices with counter-cyclical payments. Similar to the EU case, the new US farm bill strengthens the ongoing shift from coupled instruments to an environment with decoupled and coupled policies. Recent research efforts on whether or not these changes are partially or fully decoupled, i.e., minimally or do not affect production, prices and trade are reviewed in the following section.

5.   DOMESTIC AND INTERNATIONAL MARKET EFFECTS OF SUPPORT IN THE EU AND THE US

- Payments based on price floors and price triggers have direct effects on acreage, agricultural production and trade.

- Income support or decoupled payments may have direct and/or indirect impacts on production and trade in a dynamic context and in the presence of uncertainty. However, few studies have quantified these effects.

- A review of literature suggests that domestic support policies of developed countries affect price levels in world commodity markets.

5.1   DOMESTIC SUPPORT AND INTERNAL MARKETS: AN ILLUSTRATION

The impacts of price and income support on production, trade and world prices are dependent on, among other factors, the degree to which a policy is coupled to or decoupled from current production and prices (OECD, 2000; Rude, 2000). "Fully coupled" policies such as market price support (e.g., LDPs in the US and intervention prices in the EU) are generally considered more trade distorting than "decoupled" payments based on historical area in production (e.g. PFCs in the US). Partially coupled payments include MLAs, which have been disbursed as supplemental PFCs during times of low commodity prices in the US. Thus, if MLAs were fully anticipated (like CCPs are

now), they would seem to be at least "partially coupled" to current market conditions, with production impacts between those of decoupled PFCs and fully coupled LDPs (Orden, 2003; Mullen, 2001). Area and headage payments in the EU are also at least partially coupled in the sense that they are based on fixed area (set at the national or regional level) and animal numbers, but remain tied to current production.

There is consensus that market price support has a direct effect on the prices received by farmers and hence, affect production incentives and markets. In a static framework with price certainty, the subsidy effect of market price support is measured by the increase in production (movement along the supply curve) resulting from the policy. With the incorporation of uncertainty and risk aversion into the analysis, "fully coupled" and "partially coupled" policies impact production through at least two additional and distinct channels (OECD, 2002).

The first is the reduction in price variability, which decreases the degree of risk faced by farmers. In response, farmers may increase investment and production through the "insurance effect." Secondly, the payments may change farmers' attitudes towards risk. Farmers may be willing to take on more risk (including expanding agricultural production) at higher levels of wealth. Thus, price and income support can influence production decisions through the "wealth effect."[28] If the payment program is decoupled from current production and prices, the wealth effect alone is expected. However, if the program provides at least partial compensation when market prices fall, then there are insurance and subsidy effects, in addition to the wealth effect (OECD, 2002). For example, payments made under the LDP and CCP programs increase farm prices and income (subsidy and wealth effects), and also truncate the distribution of these prices at the loan rate and the target prices, respectively (insurance effect). Together the wealth and insurance effects are often referred to as the "risk reduction effects."

Decoupled payments are not related to current production or prices, and have often been placed under the "minimally trade distorting" (green box) payments or other

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[28] The wealth effect will increase production only if the decision-maker's preferences are consistent with decreasing absolute risk aversion (DARA) (Hennessy, 1998).

exemptions in WTO notifications. Both the EU and the US have increasingly used payments with varying degrees of decoupling since the mid-1990s. Recall that the annual average spending on direct payments in the EU and the US are $20.35 and $5.30 billion, respectively (table 2). Including MLA payments raises the total direct payments in the US to about $9.16 billion/year during 1996-2001. While direct income payments are generally thought to be less production distorting than market price (fully coupled) support, these payments may affect production decisions in a dynamic context or in the presence of uncertainty (de Gorter et al., 2003). In addition to the wealth effect outlined above, there are several other mechanisms through which decoupled payments can affect production. For instance, direct income support may lessen constraints due to imperfect input markets, cover fixed production costs, and create expectations about future payments and the criteria to receive them.

Rude (2000) noted that decoupled payments could lessen constraints facing farmers in capital and labor markets. For example, credit constraints due to imperfect information may prevent farmers from investing based on market signals. However, direct payments may allow banks to make loans that they otherwise would not; permitting farmers to stay in agriculture and even increase investment in their operation. Decoupled payments can also help farmers cover fixed costs and stay in business when they would otherwise not (Chau and de Gorter, 2001). Chau and de Gorter (2001) demonstrate that even if direct income payments are made on infra-marginal output only, fixed costs can be offset. In many cases market revenues do not cover total costs, but the addition of government payments raises revenue and permits farmers to recover full economic costs. Often maintaining the land in agricultural use is required to receive direct payments. Since the payments improve farmers' ability to cover costs, a farmer who would have otherwise had to exit the industry can remain in business and even expand production beyond the amount for which payments are determined. Finally, a farmer might maintain or increase acreage and production levels in anticipation of

possible restructuring of the program at a future date ("expectations effect").[29] Some make a distinction between expectations about changes in the level of support -the wealth dimension, and about changes in the rules of eligibility -the production dimension (Burfisher and Hopkins, 2003).

To illustrate the effects of domestic support on agricultural production, consider figure 15. The production possibilities between food (F) and manufactures (M) are illustrated in panel A with the initial period price ratio ($p_1 = P_F/P_M$). Note we do not assume whether the country is in autarky or free trade during the initial period. All we are concerned here is about initial production levels (F^* and M^*).

Now suppose the concerned country provides two kinds of support to food producers – price and income support. Price support is in the form of a subsidy that covers the gap between market price and a predetermined support rate for food price, whenever the latter is less than the former.[30] Income support is given to producers as a transfer payment with no linkage to current production. Suppose, the market price for food begins to fall (e.g., 1996-2001 period). Panel B of figure 15 illustrates the effect of price support, wherein the producers of food maintain their current production rather than decrease it in response to changes in prices. The maintained production levels will invariably affect the total global supply of food, if this country is fairly large (the EU and the US are indeed large). Then the lack of movement along the supply curve will bring about additional price changes, unless growth in demand through income and other changes completely absorb the new supply. Effectively, prices will further fall and create a larger wedge between producer and consumer prices. Support of this form for several years will widen the producer-consumer price gap and thus, continually increase government payments.

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[29]Tthe 2002 U.S. farm bill provided farmers an option to update "payment acreage" and "payment yield." The new "single farm payment" policy of EU has its reference years as 2000 to 2002.
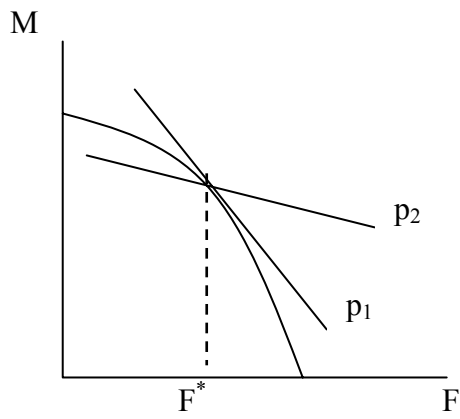[30]The price floor is not necessarily the "expected producer price." Since the probability of prices lower than loan rates is eliminated, the latter is likely to be greater than the former.

Figure 15—Effects of Price and Income Support on Production and Price Changes
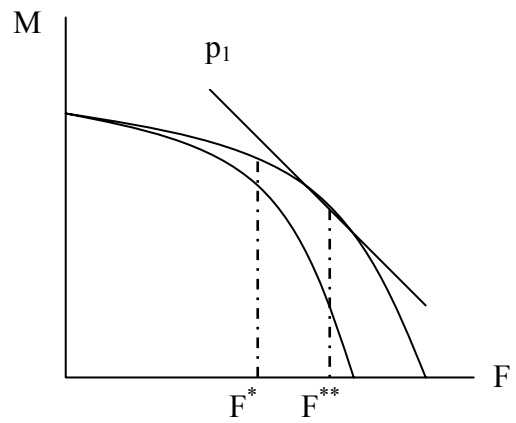
Panel A
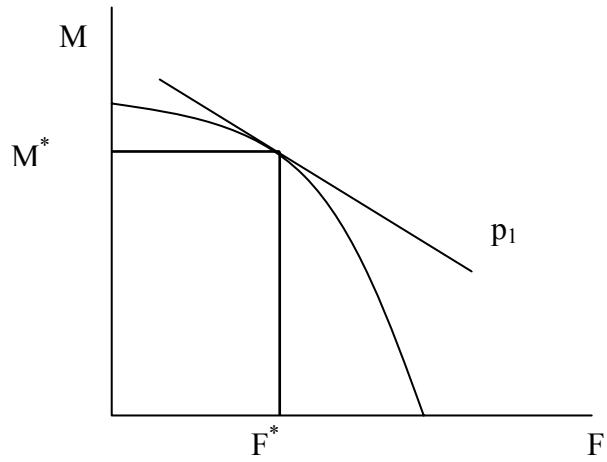
Panel B

Panel C

How does the income support affect food production? This has been an area of substantial disagreement between the developing and developed countries, but has until recently received very little analytical attention. Nevertheless, the following lays out the possible ways this type of support can impact production and prices. Consider panel C of figure 15 for a simple illustration. If a combination of the various effects of decoupled payments translates into investments (acreage or capital), then the production possibilities for this economy would realize a biased shift toward food production. Holding all else constant, food production will continue to expand (F^{**}). Combined with the price effects illustrated in panel B of figure 15, the total effect is likely to create a greater wedge between producer and consumer prices. So, even in the absence of trade barriers for these commodities, large income transfers to food producers can affect prices.

5.2   EFFECTS OF DOMESTIC SUPPORT ON PRODUCTION AND PRICES: A REVIEW OF EMPIRICAL ESTIMATES

Given the recent history of policies with varying degrees of decoupling, only a few studies have explored their acreage, output and price effects. In this section, we begin with a review of evidence on the effects of fully coupled policies followed by those of the partially decoupled or decoupled policies.

For the US, Gardner (2001) finds that the LDPs alone have raised producer prices by 20% over the market prices for grains and soybeans. Given aggregate supply and demand elasticities (0.2 and –0.5, respectively), he finds that output probably expanded by about 3% per year during the last four years. Assuming full transmission, he suggests that the world market prices would decline by about 6% per year because of LDPs alone. Westcott and Price (2001) find similar but smaller effects from LDPs.

Hennessy (1998) describes how US farm programs can affect production decisions through the wealth, insurance and the coupling (subsidy) effects under uncertainty. All three effects together increase output by about 3 percent in his analysis of an input subsidy program. Although the absolute increase in production due to the risk reduction and subsidy effects are small, the relative increase in production due to the risk

reduction effects are large compared to the increase due to the subsidy effect. He finds the effect of coupling (subsidy effect) accounts for only 10% to 20% of the total change in production, while the insurance effect accounts for 65% to 78% and the wealth effect accounts for 8.5% to 14% of the total change in production.

Mullen (2001) incorporates the wealth and insurance effects into an expected utility framework for analyzing the impacts of LDPs on wheat production in Kansas. During 1998, she finds that these two effects together elicit a greater production response than that caused by the traditional subsidy effect. Loan rates appear to have raised producer prices by 5.2% over market prices and reduced variance from $1.11 per bushel to $0.65 per bushel. Disaggregating the total impact of LDPs on wheat production into the subsidy, insurance and wealth effects, Mullen (2001) finds that less than one-third of the production increase is attributed to the subsidy effect. The insurance effect, generated by the reduction in variance of producer prices is the dominant effect (59.8 % of the total). The remaining 7.2% of the increase in production is attributed to the wealth effect. Her results indicate that at least for the crop, year and region studied, the risk reduction effects are significant. Taking the package of policies in the 1996 US Farm Bill: fully coupled LDPs, decoupled PFCs and partially coupled MLAs, Mullen (2001) finds that the subsidy effect is responsible for only 35 percent of the increase in output. The wealth and insurance effects contribute 11 percent and 54 percent, respectively, to the increase in production. While the relative increase in production due to the risk reduction effects compared to the subsidy effect in this study are not as large as in Hennessy (1998), the results confirm the importance of accounting for the risk reduction effects in analyses of the production enhancing effects of farm programs under uncertainty.

With regard to the effects of partially decoupled policies, Orden (2003) suggests that the CCPs may stimulate increased production through their revenue insurance effects, and indirectly through the wealth and expectations effects. Preliminary evidence suggests that assuming farmers are risk averse, the production impacts (via the risk reduction effects) of the CCP program in the US is less than those of LDPs, but can be of similar magnitude (Anton and Le Mouel, 2003).

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A few other studies have estimated the combined effects of partially decoupled and decoupled policies. For instance, Adams et al. (2001) find that every $1 billion in PFC and MLA payments increase acreage under the program crops by 275,000 acres. Based on the finding by Adams et al. (2001), Gardner (2001) suggests that output effects from PFCs and MLAs are about one percent, implying that they have about half of the downward market price effects of the marketing loan program. However, Westcott and Young (2001) found that PFCs have minimal effects on production, i.e., acreage increased by 0.3 percent.

Mullen (2001) finds the production effects of PFCs, i.e., the wealth effect to be around 2 percent. However, the estimates of the wealth and insurance effects of MLAs are somewhere in between those of PFCs and LDPs, if they are considered to be fully anticipated, i.e., partially decoupled payments. Goodwin and Mishra (2002) suggested that the effects from PFCs are modest, but that from MLA payments are stronger. Specifically, MLA payments may have encouraged corn acreage over soybean acreage. Since soybeans did not receive PFCs or MLAs, much of the expansion in its acreage can be attributed to either LDPs or other factors. They report also that these payments are positively correlated with farmers' acquisition of new land holdings. Goodwin and Mishra (2002) point to some anecdotal evidence that farmers do not want to reduce acreage or idle land, since "history" matters for future government payments (expectations effect). Roe, Somwaru and Diao (2002) used a dynamic general equilibrium model to focus on the effects of PFCs. They find that land values and land rental rates are affected by these payments, but production effects of PFCs are about 0.2 percent per year.[31] A recent USDA report based on farm-household survey data (same as those used by Goodwin and Mishra, 2002) and a general equilibrium model suggests that PFCs have a negligible impact on farm investment and production, although land values

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[31]Roe, Somwaru and Diao (2002) argue that the effects of PFCs are small, if consumption bundles of farm and nonfarm households are similar (homothetic preferences). The negative effects on nonfarm households are offset by the increased consumption and investment of farm households. The real issue here is whether farm households' investment pattern is similar to that of nonfarm households.

are shown to increase by about 8 percent due to the payments (Burfisher and Hopkins, 2003). [32]

The acreage, investment and production effects from decoupled payments are generally found to be small, although there is some disagreement in the literature on just how small the impacts are and whether or not they directly impact production decisions. Even if decoupled payments do not raise production and investment directly, the "expectations" effect, acknowledged in most studies, is important. So, the combination of these payments and price supports can cause the effects illustrated in panel B and C of figure 15.

In addition to the growing literature on the effects of US domestic support policies with varying degrees of decoupling, several studies have measured the production effects of compensatory payments in the EU. However, unlike most of the US studies which compare the 1996 or 2002 Farm Bills with a "free market" scenario, most recent analyses of the impacts of EU domestic support compare recent CAP reforms to previous reforms. Recall that the 1992 CAP reform resulted in lower guaranteed prices and increased income support provided through area and headage payments. The Agenda 2000 reforms further decreased the guaranteed prices, while increasing the direct payments for cereals and beef, and decreasing oilseed payments to progressively align them with the cereal payment levels. As the CAP has become progressively more decoupled, many studies have attempted to analyze both the degree of decoupling and the production impacts of these policy changes.

Cahill (1997) finds that the 1992 compensatory payments are "effectively fully decoupled" for wheat, rapeseed and soybeans and are "partially decoupled" in the case of coarse grains and sunflower. He defines an "effectively fully decoupled" policy as one that results in a level of production and trade that would have occurred if the policy were not in place. A "partially decoupled" policy is one that results in a level of production greater than that which would have occurred without the policy, but does not exceed that

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[32]Bourgeon and Chambers (2000), and Innes (2003) show that decoupled policies that transfer income in a lump-sum way are not optimal, since they encourage efficient as well as less-than-efficient producers.

which would have occurred if the policy were fully coupled. Moro and Sckokai (1998) apply the Cahill (1997) methodology to a sample of Italian farmers and find that the 1992 compensatory payments are not fully decoupled. Guyomard et al., (1996) show that in the case of France, the 1992 compensatory payments are partially decoupled, although they have only small effects on production, conditional on a fixed area in grains and oilseed production. In an analysis of the Agenda 2000 package, Gohin and Guyomard (2000) find that it is less production and trade distorting than the 1992 CAP for cereals and oilseeds because of the compulsory set-aside requirement for professional producers. Their analysis highlights the importance of considering the rate of decoupling and level of production distortion for the entire policy package, rather than for each individual policy instrument.

Unlike these studies that assume the effects of area payments as infra-marginal production subsidies (i.e. the marginal cost for output receiving payments is below the world price), de Gorter et al. (2003) argue that the blue box area payments to the major field crop sector in the EU are fully coupled in the acreage decision. In the EU, direct payments are made on a fixed base area that is set at the national or regional level. Individual farmers have eligible acres on which to receive payments and area set-asides, but no base area. If the total acres planted in the region exceeds the base area, a proportional reduction in the per unit subsidy is applied to each farmer in the region. The authors conclude that under these conditions there is no incentive for an individual farmer to limit plantings and farmers plant where marginal cost equals market price plus the per unit subsidy. And in fact, the data observed since the launch of the EU area payments shows that there have been frequent overshoots.

Several studies have included elements of price uncertainty and risk aversion in order to capture the impacts of the wealth and insurance effects of direct payments (Ridier and Jacquet, 2002; Sckokai and Moro, 2002). Ridier and Jacquet (2002) analyze the effects of different policy scenarios that gradually decouple support from production for beef farmers in two regions in France. The study explicitly takes into consideration farmers' attitudes towards price risk in a multi-period model. The authors conclude that

direct payments that are decoupled from production and based on area do have an impact on income stabilization. In the context of CAP reform, moving from support prices to decoupled payments leads to fewer cattle numbers in both regions and less intensive techniques. The results confirm that decoupled payments provide a weaker incentive to produce than more coupled subsidies. Yet, the analysis does not compare decoupled payments to a scenario with zero payments to quantify the risk-reducing production incentives.

Similarly, Sckokai and Moro (2002) model a 5% decrease in cereal intervention prices that are partially compensated by an increase in cereal area payments. Their model assumes farmers' preferences are consistent with DARA and that farmers maximize expected utility given output price uncertainty. They disaggregate the price effects from the wealth and insurance effects and find that the size and direction of the policy change (in this case one that decreases minimum prices and increases direct payments) is mainly determined by the insurance effect. For example, in the case of cereals other than durum and maize the negative output response to reduced expected prices (-1.47%) is nearly totally offset by the positive response to increase in area payments (1.36%). The insurance effect (-0.26%) is negative because of the increased price volatility due to lower guaranteed prices, while the wealth effect is a relatively small and positive (0.06%).

In a study of the effects of decoupling on Irish farmers, FAPRI-IRELAND (2003) analyzes the crop mix for cereal producers and finds that given the presence of decoupled direct payments, farmers may have incentives to move into more risky production practices. They hypothesize that in the presence of lump-sum no-risk payments, farmers may produce crops with relatively higher returns (wheat), but which may be more risky in terms of yields and inputs than other cereals (barley and oats). For the farms in the study, subsidy payments make up 47% to 74% of overall gross margin per hectare depending on farm size. In general, the larger the farm, the less is the contribution of subsidy payments to gross margin. In an analysis of the entire EU, they find that the move from Agenda 2000 baseline to full decoupling of direct payments leads to a modest

one to two percent decrease in production of wheat and barley. Other studies (e.g. Binfield et al., 2003) also show that the Mid-Term Review-type reforms (lower guaranteed prices, full decoupling, etc.) reduce area and production, with results dependent on baseline and policy assumptions. Conforti et al., (2002) find that decoupling of direct payments leads to a 5-15% reduction in production of cereals, oilseeds and beef compared to the Agenda 2000 baseline.

5.3   DOMESTIC SUPPORT AND INTERNATIONAL MARKETS

How does EU and US domestic support affect world markets and, in turn, affect prices and production in other (developing) countries? To answer that question, we need to place the domestic support policies in a broader context. One recent study finds that the removal of all export subsidies, tariffs, tariff rate quotas, and output and input subsidies in high-income countries would increase rural value-added in low- and middle-income countries by more than $60 billion per annum (Beghin et al., 2002). World Bank estimates place the global welfare gains from the full removal of all protection (border and domestic) at more than $350 billion, with the largest gains coming from tariff reform (World Bank, 2003). In a study by Diaz-Bonilla (2003), developing country net exports increase by $31.4 billion when the US only liberalizes agricultural trade (export subsidies, market access and domestic support), $42.6 billion when the EU liberalizes and $60.8 billion when all industrialized countries liberalize (a 198% increase from the 1997 baseline).

Focusing specifically on domestic support, Gardner (2002) estimates that US commodity support policies (including LDPs, direct payments and crop insurance) increased the supply of cereals and soybeans by about 4 percent and decreased world prices by about 6 percent over the period 1998-2001.[33] While this study only takes into consideration the subsidy effect of LDPs, Orden (2003) points out that the insurance effect can induce impacts of similar magnitude, while Hennessy (1998) and others have

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[33]Gardner (2002) cautions that the conservation reserve program has reduced supply by about 7% over the period 1998-2001, more than offsetting the output increase due to the LDP, PFCs and other programs.

shown that the relative magnitude of the insurance effect can be up to three times greater than the subsidy effect. Likewise, using Hennessy's (1998) results show that the wealth effect may have production inducing impacts of similar magnitude to the subsidy effect. The OECD (2001) calculated the effects of crop support measures in Canada, the EU, Japan, Mexico, Switzerland and the US on production and world prices. They model the effects of a simultaneous10% decrease in the rates of market price supports and payments based on output, area planted, historical entitlements, and input use on world prices and find that cereal and oilseed prices increased from 1.3% for oilseeds to 3.0% for wheat. A 10% reduction in just market price support elicited the largest increase in world prices (from 0.3% for oilseeds to 1.1% for wheat). Meanwhile, a 10% reduction in just payments based on historical entitlements leads to just a 0.1% to 0.2% increase in world prices.

Given the result that payments based on historical entitlements are relatively less production distorting than other types of payments, Dimaranan et al., (2003) formally address impacts on developing countries of a reform scenario where a 50% reduction in tariffs and export subsidies in OECD countries is compensated by land payments designed to maintain farm income in each member country. They find that this scenario results in increased welfare for most developing countries. Meanwhile, a 50% reduction in domestic support for all agricultural commodities in the OECD results in a decrease in the welfare of developing countries as a group. Argentina, Brazil and India are the notable exceptions. Rae and Strutt (2002) and Hoekman et al., (2002) reach similar conclusions that border measure reforms generate far greater trade and welfare gains for developing countries than domestic support cuts. However, as Hoekman et al., (2002) caution, developing countries rely on tariffs to reduce price volatility, while developed countries have in place domestic support policies that have the same effect. Thus global liberalization of agricultural tariffs without concurrent domestic support reforms in OECD countries may lead to welfare losses in developing countries. Thus, the authors conclude that substantial reduction in developed country domestic support measures are

important because they lead to welfare gains for net-exporting developing countries.[34] In addition, domestic support reforms in OECD countries could also permit developing country governments to pursue welfare improving trade liberalization policies of their own.[35]

6. SUMMARY AND CONCLUSIONS

The components of domestic support policies of the EU and the US during 1996-2001 are presented here on a commodity basis and program basis. The annual average value of EU agricultural production is about 30% more than that of the US. However, the EU domestic support estimate is more than twice that of the US. In general, support levels for most commodities show an increasing trend in the US until 1999 or 2000, and have fallen modestly since. Average annual US support as a percent of border price ranged from a high of 71.2% for rice to 10.7% for soybeans during 1996-2001. Despite the lack of a clear trend in EU support levels, prices have been held stable through a combination of intervention prices and compensatory payments. EU domestic support levels as a percent of border prices are generally higher than those of the US. In addition, production and acreage of several major commodities in the EU and the US have remained stable or increased during 1996-2001.

The EU and the US domestic farm support policies provide a combination of price and income support. While price support has been acknowledged to have direct effects on production and prices, the effects of direct payments have received limited

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[34]A population of over 375 million people in the European community with higher (average) per capita income points to a large market for food products. The EU import duties, no doubt, deter imports, but at the same time lower the world market prices for a number of developing country exporters. This scenario applies to a lesser extent in the case of the U.S., where high tariffs prevail mostly in sugar, dairy and peanut sectors. In addition, export subsidies account for a significant share of CAP expenditures. While the U.S. does not explicitly subsidize exports, credit guarantees to exporters averaged about $3.5 billion. Together, tariffs and export subsidies adversely affect agriculture's terms of trade in the rest of the world, especially in the net-exporting developing countries.

[35]The fall in world commodity prices and bounded tariffs from the URAA may, however, limit the reform options of developing countries' with high agricultural employment. Many developing countries have raised and lowered tariff within the WTO bound rate (like countervailing duties that account for production subsidies in exporting countries) to tide over world market fluctuations.

attention. The direct payments' effects on wealth and risk aversion, and thus, on farm investment and planted acreage of major crops, have been the focus of few empirical studies. Initial findings for the US suggest some effects on production, but raises concerns on the "expectations" effect of direct or decoupled payments. That is, most farmers did not reduce or idle acreage under program crops since farm history is critical to payment acreage and payment yield in future government programs. As of now, very little work has gone into measuring this "expectation" effect, but most authors agree it is difficult to measure.

There is agreement that domestic support payments (coupled versus decoupled) have differential impacts on EU and US acreage and production of major crops. However, developing countries are concerned about the effects of these programs on world market prices since the EU and the US hold large production and trade shares in world markets. More specifically, developing countries claim that the continuation of the developed countries' support programs on a large scale would result in output expansion and substantial downward pressures on world prices. Furthermore, the partial or full transmission of the world market price changes due to support programs can bring about rapid structural change especially in countries which are heavily dependent on agriculture. Inadequate educational infrastructure and the lack of safety nets may push the populations of some of these (developing) economies into hopelessness and poverty.

The initial EU and US agricultural proposals for the Doha round focused on reducing market access barriers and export subsidies, but refrained from limiting domestic support measures. Developing countries' effective opposition to those proposals, especially the classification of support in the URAA, has been a major reason for the collapse of the WTO negotiations at Cancun, Mexico.

The Doha Work Program approved by WTO members on August 1, 2004 has outlined specific proposals for progress on each of the three pillars – market access, export subsidies and domestic support. In the case of domestic support, some proposals reflect developing countries' views such as the reductions in product and non-product specific *de minimis* provisions, and the criteria for blue box payments (e.g., fixed and

unchanging areas and yields). Other proposals reflect developed countries' views such as the bounds to blue box payments and the continued placement of direct payments in either blue or green box. However, the extent of reductions and the accompanying modalities are to be worked out during the next 16 months. The final agreement, expected at the Hong Kong WTO Ministerial Conference in December 2005, likely depends on whether or not the new proposals and their modalities would result in meaningful limits on domestic support.

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