Domestic Support to Agriculture and Trade:

Implications for Multilateral Reform

Jared Greenville

ICTSD

International Centre for Trade and Sustainable Development

Issue Paper

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ICTSD welcomes feedback on this publication. This can be sent to Jonathan Hepburn, Senior Programme Manager, Agriculture (jhepburn@ictsd.ch) or to Fabrice Lehmann, ICTSD's Executive Editor (flehmann@ictsd.ch).

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LIST OF ABBREVIATIONS

AMS	Aggregate Measure of Support
EU	European Union
DVA	domestic value added
FVN	fruits, vegetables, and nuts
GDP	gross domestic product
GTAP	Global Trade Analysis Project
GVC	global value chain
MPS	market price support
NRA	Nominal Rate of Assistance
OECD	Organisation for Economic Co-operation and Development
PSE	Producer Support Estimate
R&D	research and development
SCT	single commodity transfer
TSE	Total Support Estimate
US	United States
USD	US dollar
WITS	World Integrated Trade Solution
WTO	World Trade Organization

FOREWORD

In recent decades, huge progress has been made throughout the world in lifting vast numbers of people out of poverty, creating jobs, and protecting our fragile planet. At the same time, however, millions of people still do not live dignified lives in which their basic needs are met, and cannot be sure that their children and future generations will have a safe place to live in which they can survive and prosper.

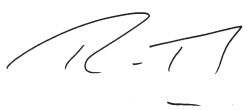
Since the Second World War, governments have collaborated to develop institutions and common legal frameworks which in retrospect can be seen to have provided the basis for the steady growth in prosperity that has since transformed so many people's lives. In the area of trade, as elsewhere, the agreements that have emerged from this process have been far from perfect: indeed, they have often been unfair in important ways. At the same time, because they have built on a legal framework that centres on principles of equal treatment and non-discrimination, they have nonetheless been widely seen to provide an enduring basis for closer economic integration between countries and world regions.

Despite recent achievements, there is no room for complacency. As climate change threatens to intensify the common challenges we face in the years ahead, countries will need to redouble these efforts to collaborate, rather than mistakenly assume that any one country can succeed alone. Working together across national borders will be critical to ensuring respect for fundamental rights, and ensuring that people are free to live meaningful and fulfilling lives.

In September 2015, governments at the United Nations took a major step towards defining a common framework for future action, when they adopted seventeen Sustainable Development Goals as part of the new Agenda 2030. Among other things, this included a commitment to end hunger and all forms of malnutrition by 2030. Better functioning markets for food and agriculture are integral to this bold new vision: governments agreed, for example, to "correct and prevent trade restrictions and distortions in world agricultural markets" as one of the measures they would take to help achieve this goal.

In December of the same year, members of the World Trade Organization took an important step towards this objective when they agreed to eliminate agricultural export subsidies at the global trade body's Nairobi ministerial conference. The agreement built on other recent developments at the WTO, such as the outcomes on trade facilitation and food security at the Bali ministerial two years previously. Negotiators are now exploring options for further progress ahead of the December 2017 conference in Buenos Aires, Argentina. While the vast majority of governments have expressed a desire to see progress in addressing the trade distortions caused by agricultural subsidies, a few countries remain concerned about the impact of new commitments on their own domestic producers.

This paper, by Jared Greenville, therefore seeks to provide trade negotiators and other relevant policy actors with current and specific information on the degree to which global markets for key agricultural products and product groups are affected by distortions resulting from government policies, with a view to helping inform the debate over updating global rules in this area in the run-up to the Buenos Aires ministerial conference and beyond. As such, we hope it will represent a useful contribution to how governments can help to ensure that policies and rules affecting the global food system are equitable and sustainable.



Ricardo Meléndez-Ortiz
Chief Executive, ICTSD

EXECUTIVE SUMMARY

Progressing multilateral agricultural trade negotiations has proven to be difficult, with mixed outcomes achieved since the Doha round at the WTO began in 2001. However, the recent 2015 agreement on the removal of agricultural export subsidies as well as other measures related to special safeguards and public stockholding for food security has kindled hope that further agreement on domestic support and market access might be achievable in the near future.

Given this backdrop, this paper seeks to provide some information relevant to informing discussions on possible reforms to domestic support by providing an update on changes in support to agriculture across major agricultural producing economies. It takes a closer look at the changes that have taken place in economies covered by the OECD's *Producer Support Estimate* (PSE) database in the nature and level of support provided over time. In particular, it explores which commodities are the focus of most government support, and the effects that this support has on agricultural trade.

The PSE data shows that support to agriculture has experienced a general decline in aggregate terms across the OECD members and nine emerging economics covered since the early 2000s; however, there have been divergent trends within different subgroups of economies. Specifically, some OECD and emerging economies show stagnating high or increasing levels of support to their agriculture sectors. For these economies, there is a high reliance on forms of support that are most distorting to trade and markets. In others, support has been decoupled from production and overall levels reduced.

Overall, across all economies examined, the support that remains is concentrated on a small number of targeted production activities: rice, maize, beef, pork and dairy. In total, these five sectors capture around 75 percent of the total single commodity support (based on 2015 support levels) and around 35 percent of all support measured. Most single commodity support is delivered through market price support and has remained relatively stable over time.

Within the major commodities targeted by government support, trends over time vary and can be broken into four groups: falling levels of support across both market price support and other categories (beef, dairy and wheat); rising levels of market price support but falling levels of other support (maize and pork); stable support across both market price support and other categories (rice); and falling market price support but rising levels of support provided under other categories (sugar).

Focusing on non-market price support reveals that these measures are influencing trade and reducing global welfare. For the five most supported commodities, the changes in trade volumes are mixed and depend on both current support levels and the presence of other trade barriers (assuming market price support through trade protections remain in place). Further, market distorting domestic support negatively influences the gains from participating in global agriculture and food value chains. The impacts of removing domestic support highlight the importance of also progressing reforms to market access barriers to complement the potential benefits on offer from multilateral reforms.

Importantly, when undertaking reforms to agriculture, the right type of support remains important. Domestic support that is provided in a non-distortionary manner and focuses on the provision of public goods has the potential to improve welfare.

1. INTRODUCTION

Current multilateral agricultural trade negotiations have proven to be difficult, with the current round that began in 2001 as yet failing to reach a conclusion. However, there have been some successes. Most recently, in 2015, an agreement was reached on the removal of agricultural export subsidies as well as other measures related to special safeguards and public stockholding for food security (ICTSD 2016). This agreement has kindled hope that something else might be achievable in the near future in other areas of the negotiations: domestic support and market access.

In particular, there has been renewed interest in looking again at domestic support, including helping to address the issues related to public stockholding for food security purposes around administered prices. This paper seeks to provide some information relevant to informing discussions on possible reforms to domestic support. It does so by taking a closer look at the changes that have taken place in countries covered by the Producer Support Estimate (PSE) database of the Organisation for Economic Co-operation and Development (OECD),[1] both in the aggregate and for individual commodities, and in the nature and level of support provided over time. Further, it seeks to explore some of the possible effects that changes to support may have on markets and what this may mean for the direction of future negotiations.

Much has already been written about the current round of negotiations at the World Trade Organization (WTO) and the potential for an agreement to be reached—including a range of assessments of package options. In general, reports by various authors have shown that there is merit in further reducing the distortions that exist in agricultural markets and that a failure to do so may result in future costs. This then leaves the issue of what possible steps could be taken to realise some of the gains that are on offer, and whether some steps are more important to take than others. Domestic support in this paper is measured based on its economic effects and not with reference to the WTO Agreement on Agriculture (see Box 1). The focus is therefore on the distortions to agricultural markets rather than on individual country performance against their WTO commitments as measured by the Aggregate Measure of Support (AMS) framework.

1 Countries covered include: Australia, Canada, Chile, the European Union (EU), Iceland, Israel, Japan, the Republic of Korea, Mexico, New Zealand, Norway, Switzerland, Turkey, the United States (US), Brazil, Colombia, the People's Republic of China, Indonesia, Kazakhstan, the Russian Federation, South Africa, the Ukraine, and Viet Nam.

Box 1: Differences between the PSE and AMS

While both the PSE (see Box 2 for further details) and the AMS in the WTO are used in similar ways to assess levels of domestic support provided to agriculture, there are important differences between them.

The AMS was developed for the WTO Uruguay Round Agreement on Agriculture to assess countries' commitments under the agreement through a structured monitoring approach. The AMS is based on the theoretical concept of the PSE and the two indicators are constructed in a similar way. Both include market price support (MPS), budgetary transfers, and revenue foregone, and are measured on an annual basis. However, because they were developed for different purposes—the PSE to monitor and evaluate progress of agricultural policy reform and the AMS to form the basis for a legal commitment within the WTO Agreement on Agriculture to reduce domestic support—there are important differences in terms of policy coverage and the economic value of measured support.

The AMS has a narrower policy coverage than the PSE, and includes only domestic policies deemed to have the greatest production and trade effects (classified to the so-called Amber Box). Unlike the PSE, it excludes trade policies covered under the WTO market access and export subsidisation disciplines; production-limiting policies (Blue Box); those policies deemed non- or least trade-distorting (Green Box); and certain trade-distorting policies (for example, input subsidies) when the level of domestic support is smaller than a specified *de minimis* level. Further, the classifications of various budgetary transfers also differ with the PSE focused on the way in which policies are implemented as its basis for categorisation. In this way, the PSE assesses whether a payment is decoupled from production or not through the way in which it is delivered to farmers. This classification allows distortion to be separated between production distorting or non- (or less-) distorting. The PSE thus does not exclude transfers based on certain criteria.

The PSE is a measure of the "current" value of transfers from consumers and taxpayers to producers while the AMS is not. In the PSE, MPS is calculated using actual producer and border prices for commodities in a given year while in the AMS, the MPS is calculated using the difference between annual administered prices fixed by policy makers and world prices according to a base period (generally the three-year 1986–88 average). This results in an MPS value that is very different from what is actually being transferred from consumers to producers.

Source: Adapted from OECD (2009).

The rest of this paper is structured as follows: Section 2 explores changes in aggregate levels of support provided to farmers as measured by the OECD's PSE including changes in the composition of that support (Box 2). Section 3 takes a closer look at the payments within the PSE that accrue to individual products. Section 4 discusses the possible effects of removing domestic support on agricultural trade and welfare, and Section 5 explores the possible future steps for removing distortions in agricultural markets and the role to be played by reforming domestic support.

Box 2: The OECD's PSE

In the OECD's PSE, support is understood to represent gross transfers to agriculture from consumers and taxpayers arising from governments' policies that support the sector. In this way, support includes all direct budgetary transfers from governments to agricultural producers or to the sector in general, along with any transfers that are created through policy decisions. The PSE reflects the provision of support or the level of effort made by governments, as implied by their agricultural policies, but it does not measure policy *impacts* on production, farm incomes, consumption, trade, or environment. Measures are classified according to their implementation rather than their intended effects. For example, a subsidised insurance policy may be in place to maintain farmer incomes in times of low prices, but, as the policy influences the price of an input into the producer's production, it is counted as an input subsidy.

From a practical viewpoint, this means that the PSE includes both measures that are traditionally viewed as domestic support: those of direct subsidies to outputs and inputs, along with measures that create price effects in a domestic economy, such as tariffs and other trade restrictions (tariffs, quotas, licensing or non-tariff measures are captured in estimates of MPS). The various classifications used to differentiate the policies mean that these differing effects are all recorded within the database and, therefore, analysis can focus on specific areas of interest.

For this paper, measures of MPS capture support provided through administered prices and policies related to trade restrictions. Measures that involve direct government budgetary outlays directed to individual farmers are captured by payments related to outputs, inputs (variable, fixed, or tied to current land area), and those of decoupled payments (representing payments to those classified as farmers but unrelated to the product they produce or the level of output produced). Within this grouping of support, MPS and support directed to outputs or inputs represents the most production-distorting form of support and, thus, the type of support that is most likely to affect domestic and world agricultural markets. Decoupled support, on the other hand, is less production distorting as it is provided directly to households independently to, or at least less dependent on, production.

Source: OECD (2016c).

2. DOMESTIC SUPPORT IN THE AGGREGATE: COMPOSITIONAL SHIFTS AND CONVERGENCE

Overall measures of support (MPS and direct government budgetary support), as captured by the OECD PSE, point to a fall in the level of support as a percentage of gross farm receipts (the sum of the value of production plus the budgetary support provided to the sector) provided to agricultural producers across the countries covered. Average support levels across OECD countries fell from 32 percent of gross farm receipts in 2000 to 17 percent in 2014 (OECD 2015a).

However, in terms of absolute support levels, amounts have been increasing and there appears to be a convergence in the use of producer policies by developed OECD countries and those in some large agricultural producing developing countries[2]—in particular, those that directly support individual farmers through measures that provide MPS or payments related to inputs used or outputs produced (Figure 1). Since 1995, effective transfers to individual farmers by larger developing countries have been increasing, driven in part by rising levels of development and incomes within these countries, and, for some, a push towards policies aimed at achieving self-sufficiency in particular agricultural products (such as in China and Indonesia). In developed countries, a mix of reforms in some countries and changes in world food prices has played a role in the changes observed in the total levels of support, with total nominal support remaining relatively constant. It should be noted, however, that estimates of support are sensitive to changes in exchange rates. In the instance of large exchange rate movements, as was seen in 2015 with the US dollar (USD), aggregate changes in support can vary depending on the currency used (Box 1). Nevertheless, as measurement in all currencies is sensitive to this, it remains a caveat of the analysis.

2 The nine economies that were included in the PSE database in 2015 included: Brazil, China, Colombia, Indonesia, Kazakhstan, the Russian Federation, South Africa, the Ukraine and Viet Nam. Costa Rica and the Philippines will be included in 2017.

Box 3: Implications of exchange rate movements on the PSE

While support is measured for each country covered by the PSE, the estimates and, in particular, the aggregates across countries are influenced by exchange rate movements. During 2014 and 2015, movements in exchange rates of some countries relative to the USD have been particularly significant. Exchange rates affect the calculation of agricultural support in two distinct ways.

First, exchange rate movements can account for a significant portion of the change in MPS even when domestic policies and world prices do not change. For given world prices expressed in USD, a change in the external value of a country's currency alters the reference prices for the agricultural products which are expressed in the local currency. As a consequence, a weaker local currency will, all other factors being equal, increase reference prices calculated for the given country. If domestic prices do not move in line (or fully in line) with those at the border, the exchange rate movement will reduce the country's market price and overall support level. Strengthening local currencies will have the opposite effects on support levels.

Second, changes in exchange rates affect changes in monetary values such as the total PSE or the Total Support Estimate (TSE) when expressed in a common currency. A declining (increasing) external value of a local currency will result in a falling (rising) support estimate when expressed in the foreign currency, such as the USD or the Euro. While this matters for international comparisons, it is particularly important for aggregates across countries such as OECD totals or totals for all countries like those presented in this paper.

The strong movement in exchange rates in 2015 has direct implications for the aggregate PSE calculated and cross-country comparisons. In USD terms, the data suggest that total PSE in the OECD has fallen by 14 percent between 2014 and 2015, while in all countries it fell by 3 percent. In contrast, when expressed in Euros, total support for these two aggregates has increased by 2 percent and 16 percent in the same period.

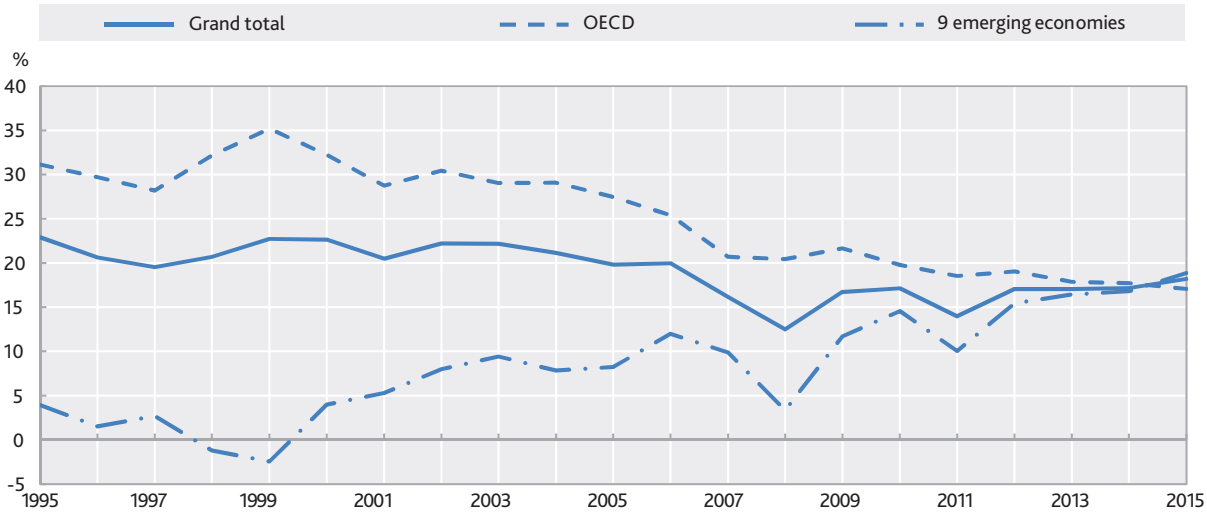
However, these problems can be overcome by using relative indicators: the %PSE (representing the PSE as percentage of gross farm receipts) and the %TSE (TSE as a percentage of gross domestic product (GDP)), or by comparing relative support on a sector-by-sector basis as both the nominators (total PSE or TSE) and the denominators (gross farm receipts or GDP) are affected by exchange rate movements in exactly the same way. These indicators are robust with respect to exchange rate movement. Therefore, both estimates are presented in this paper.

Source: OECD (2016a).

In 1995, the nine developing economies for which the OECD collects information on agricultural policies accounted for just under 5 percent of the total measured PSE (OECD and emerging economies). By 2015, these nine countries accounted for over 51 percent of the total. Most of this change has been driven by increasing support levels in China and Indonesia, with countries such as Brazil and South Africa, which both had low levels of support in 1995, maintaining and even decreasing these low levels.

Figure 1: Trends in PSE: OECD and emerging economies

PSE % 1995 to 2015 (USD terms)



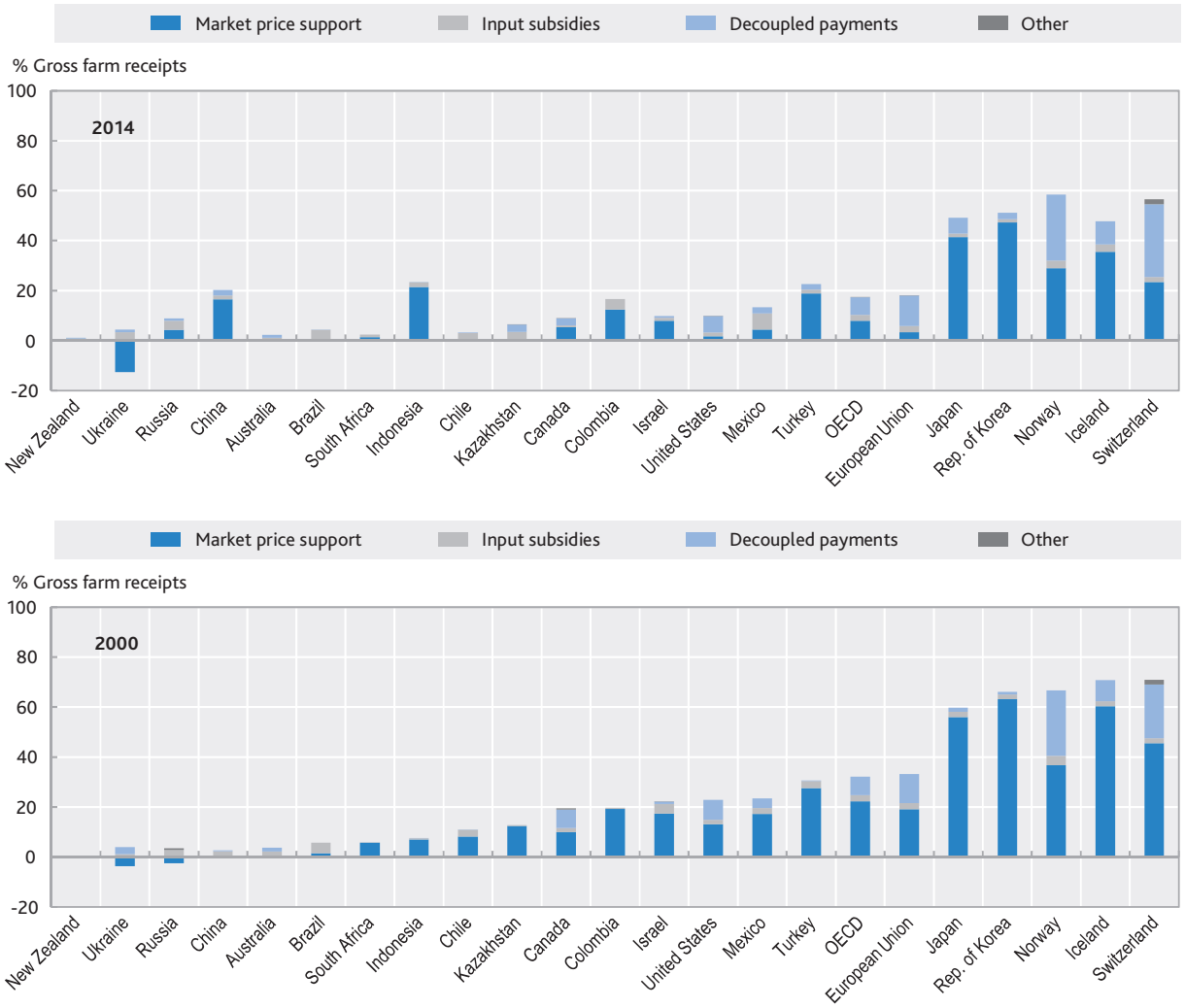
Notes: The nine developing economies that were included in the PSE database in 2015 were: Brazil, China, Colombia, Indonesia, Kazakhstan, the Russian Federation, South Africa, the Ukraine, and Viet Nam (from 2000 onwards).
Source: Author estimates based on OECD (2015a).

The composition of support provided to agricultural producers has also changed alongside the aggregate level of support (Figure 2). Overall, OECD countries still dominate the high rates of support, particularly Switzerland, Iceland, Norway, Korea, and Japan. However, for many OECD countries, the share of the PSE made up of the most distortionary type of policies has fallen since 2000. This is most notable for the EU where in 2014 around 68 percent of its support consisted of decoupled payments (payments not directly related to production, such as the EU's single payment scheme) compared to around 35 percent in 2000. Japan has also taken steps in this direction but to a much lesser extent. Within some emerging countries, notably Indonesia and China, the growth in PSE has been driven by a growth in the use of policies that are most distortionary in terms of their impact on trade— including MPS (which represents the difference between domestic prices and that of an undistorted reference price, and captures the impact of tariffs and other border barriers), output-based payments, and input subsidies. Other economies, such as Brazil, show both a falling PSE and a shift towards decoupled payments.

The change in the composition of support by some OECD countries has also been driven by changing objectives. For the EU, for example, policies are increasingly focused on non-commodity outputs from the sector related to the environment and other objectives such as cultural landscapes, biodiversity, and rural development.

Figure 2: Composition of the PSE

% of gross farm receipts, 2000 and 2014



Source: OECD (2015a).

3. SUPPORT TO PARTICULAR COMMODITIES IS CONCENTRATED AND HAS BEEN MAINTAINED

While changes have been witnessed in the aggregate PSE, particularly with average levels in percentage and absolute terms falling in some countries, there appears to have been significantly less change when looking at the support provided to specific commodities. Within the PSE framework, where support is targeted towards particular types of producers, it is captured within the single commodity transfer (SCTs) measure. This measure collects all government support that can be attributable to the production of particular commodities, be it direct payments such as output or input subsidies, or conferred by other interventions such as tariffs or quotas that create price gaps between domestic and international markets (MPS). The payments covered include all those made by governments irrespective of the classification that may exist under the Agreement on Agriculture.

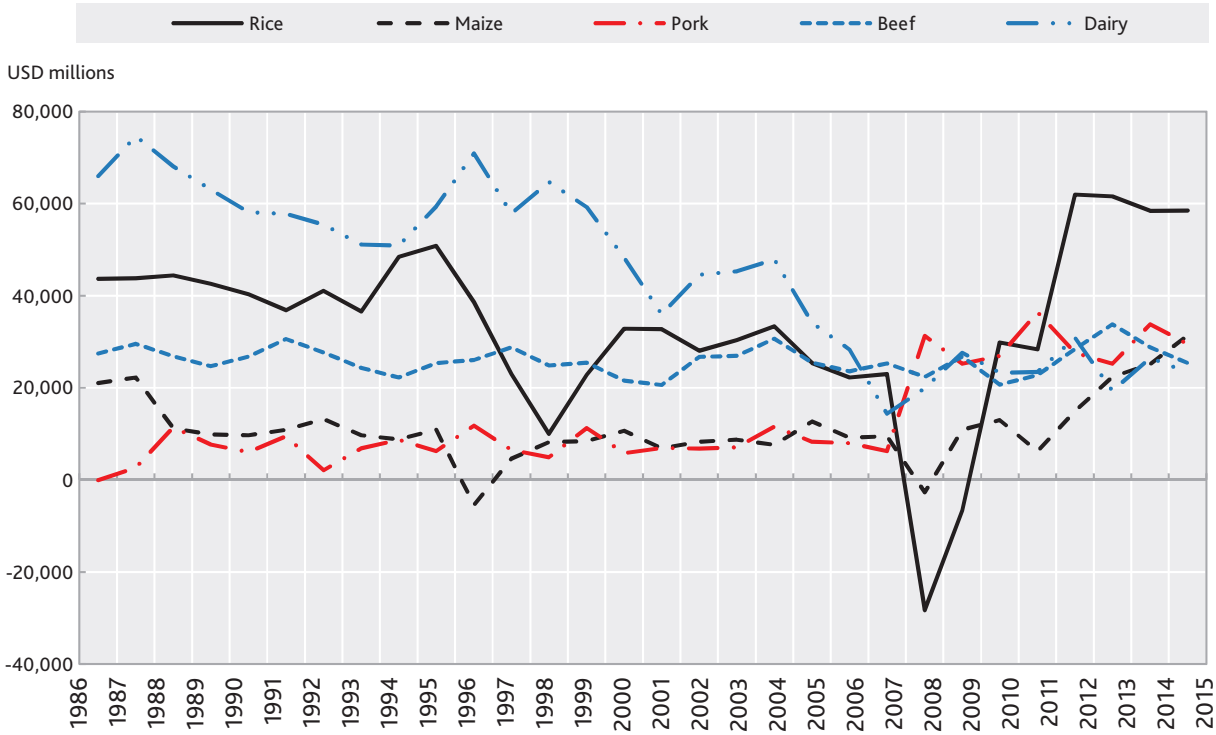
Looking at the absolute levels of support provided to single commodities reveals that trends over time have been relatively flat, with recent increases for some products since the mid-2000s (rice,[3] wheat, and pork) (Figures 3 and 4). Overall, within the PSE database, the rice, maize, pork, beef, and dairy sectors are the most supported sectors by governments (in absolute terms). In total, these five sectors capture around 75 percent of the total single commodity support (based on 2015 support levels). Of the remaining single commodity payments, wheat has been a focus of governments on and off over time. Similarly, support to poultry has risen since 1995, but in more recent years it has fallen.

However, in relative terms, since 1986 there has been an overall fall in the level of commodity-specific support as a percentage of gross farm receipts—that is, total gross farm receipts of the sectors in countries providing support sectors and not including the sectors of countries where no commodity-specific support is provided. For the top 10 supported commodities, support has fallen from 39 percent of gross farm receipts in 1986 to 20 percent in 2015 (top six shown in Figure 5). Part of the fall has been driven by rising international prices that have led to a narrowing of price gaps and a fall in MPS despite no policy change occurring. That said, support in these sectors remains high relative to the value of production.

3 High levels of support for rice are due to support being concentrated in some of the world's largest rice producers and, from a percentage viewpoint, because the share of support is only explored relative to gross farm receipts in the countries examined rather than total value of global production. High percentage rates of support for Colombia are due to border protections (MPS).

Figure 3: Top five supported single commodities in countries covered by the OECD PSE database

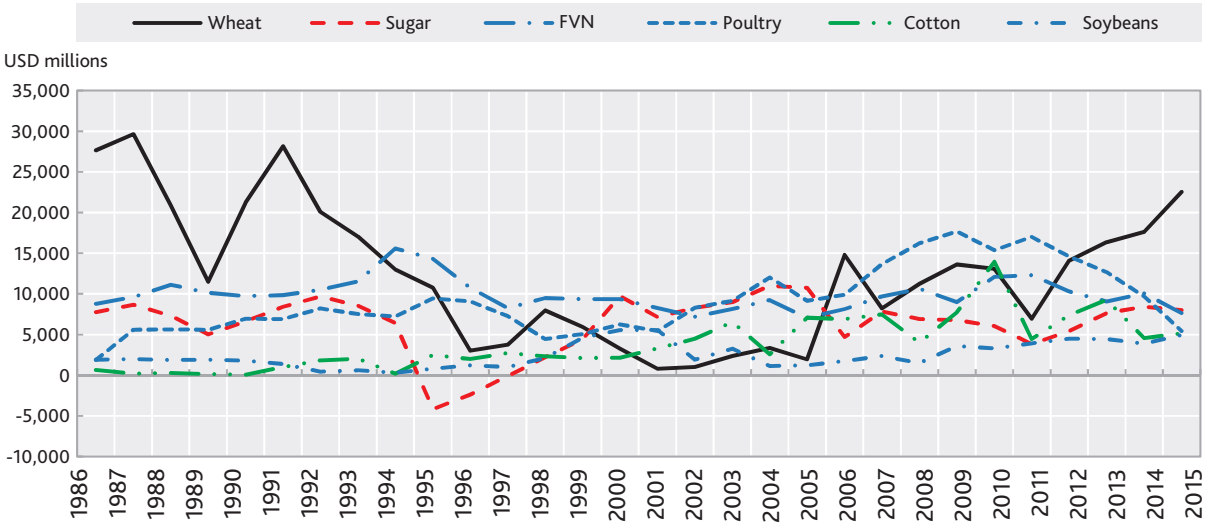
Real USD millions, 1986-2015



Notes: Real value calculated by deflating values in USD by the US GDP deflator.
Source: Author estimates based on OECD (2016a).

Figure 4: Remaining supported commodities in countries covered by the OECD PSE database

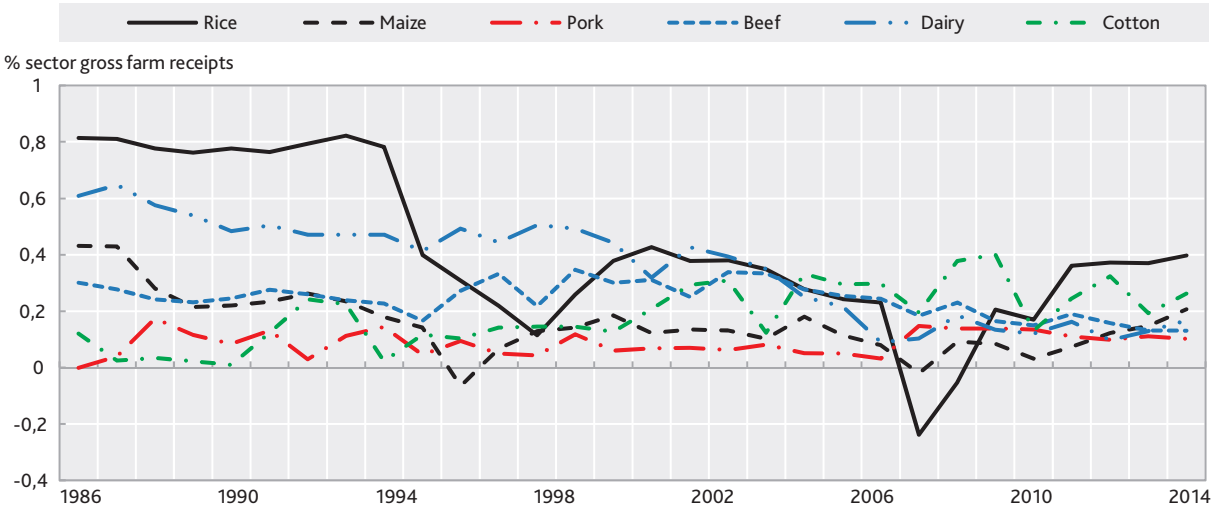
Real USD millions, 1986-2015



Notes: FVN (fruits, vegetables, and nuts) represents the combined support for various individually supported crops within this broader categorisation.
Source: Author estimates based on OECD (2016a).

Figure 5: Single commodity support share of gross farm receipts in countries covered by the OECD PSE database

% of gross farm receipts of sectors receiving support

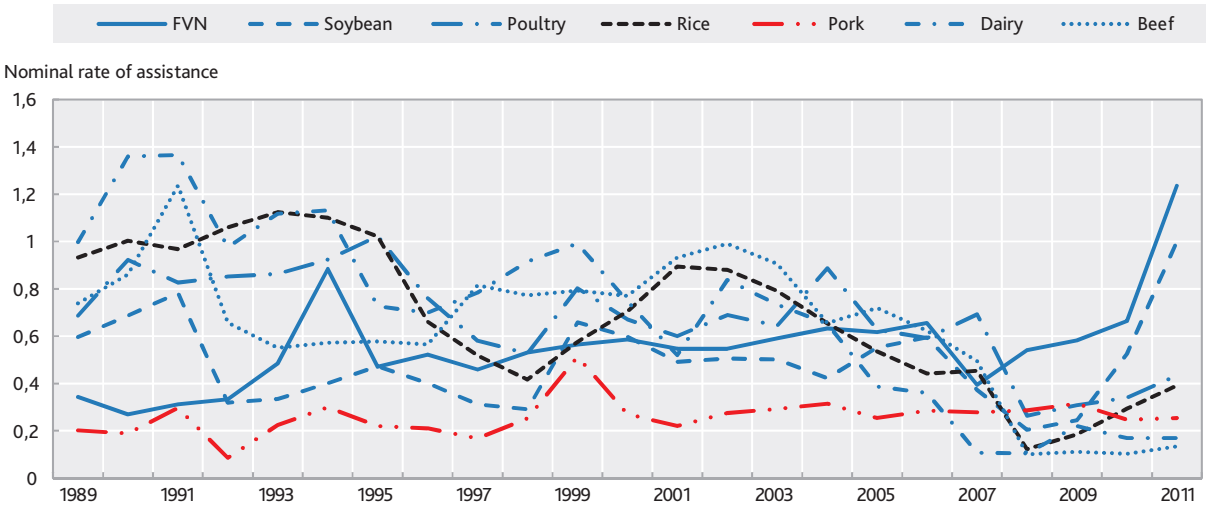


Source: Author estimates based on OECD (2016a).

Beyond the OECD's PSE database, other data on support provided to specific commodities point to a similar set of commodities and similar trends. Although recent data are not available, the World Bank's Nominal Rate of Assistance (NRA) database points to the same commodities being the focus of government support but with a higher degree of support provided to FVN. The NRA is defined as the percentage by which government policies have raised gross returns to farmers above what they would be without the government's intervention (or lowered them, if NRA<0). Specifically looking at output subsidies (so as to better capture domestic support), trends in the NRA also show a declining level of government intervention up to the food price spikes of 2007/08, after which support is seen to increase.

Figure 6: Nominal rate of assistance estimates point to a similar targeted commodity mix

Average NRA from output subsidies for main supported commodities



Source: Author estimates based on World Bank (2012); Anderson and Valenzuela (2013); Anderson and Nelgen (2013).

3.1 Who is Supporting What?

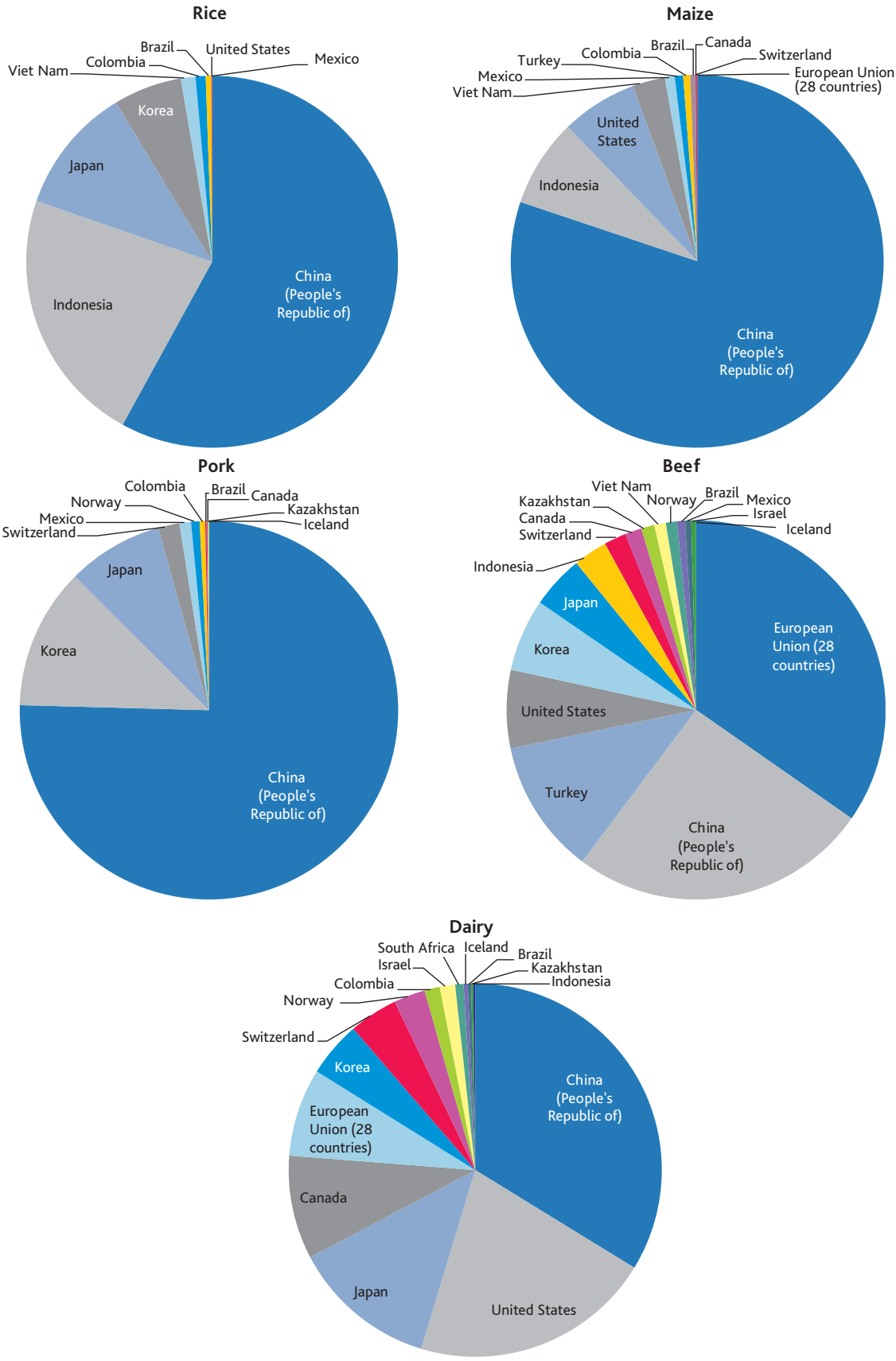
From a trade perspective, it is not only the level of support that is an issue but also who is providing that support. If support is concentrated in countries which have the ability to influence global agricultural markets or which are significant agro-food traders, then the support is likely to be more distorting than if it were spread diffusely across a wide range of countries that have a limited ability to influence world agricultural markets. However, even in the latter case, if support is such that it represents a significant share of the sector's production, or places a significant burden on the rest of the economy, then it will create costs for domestic households and other industries. Looking at who provides support within the PSE database for the top five supported commodities, data indicate that much of the support is provided by large agro-food producing countries who are heavily involved in international trade.

For a number of commodities, what is noticeable is that a significant amount of the absolute support provided comes from major agricultural producing and trading nations (Figure 8). A number of large OECD members, in particular the US and the EU (along with Japan and Korea), account for a significant share of total support for beef and dairy. Canada also accounts for significant shares of support provided to dairy, with both Japan and Korea also providing significant levels of support to their rice industries.

China plays a significant role in the total level of support that is provided for rice, maize, and pork. This is a combination of both size and policy choices. China is the world's largest agricultural producer and, therefore, providing even low levels of support to a large number of producers can amount to a significant absolute value of support. However, it is not only size that plays a role; policy choices have also been responsible, with the relative levels of support for rice and maize being around 30 percent of gross farm receipts in those sectors and around 10 percent for pork (Figure 8).

Figure 7: Country support to top five supported commodities

Share of total single commodity support



Notes: SCTs do not include non-targeted payments that accrue to all producers in a country. For example, they exclude a fertiliser subsidy that is available to all agricultural producers and not targeted to specific activities. Estimates based on SCTs alone, therefore underestimate the support provided to these producers in some countries.
Source: Author estimates based on OECD (2016a).

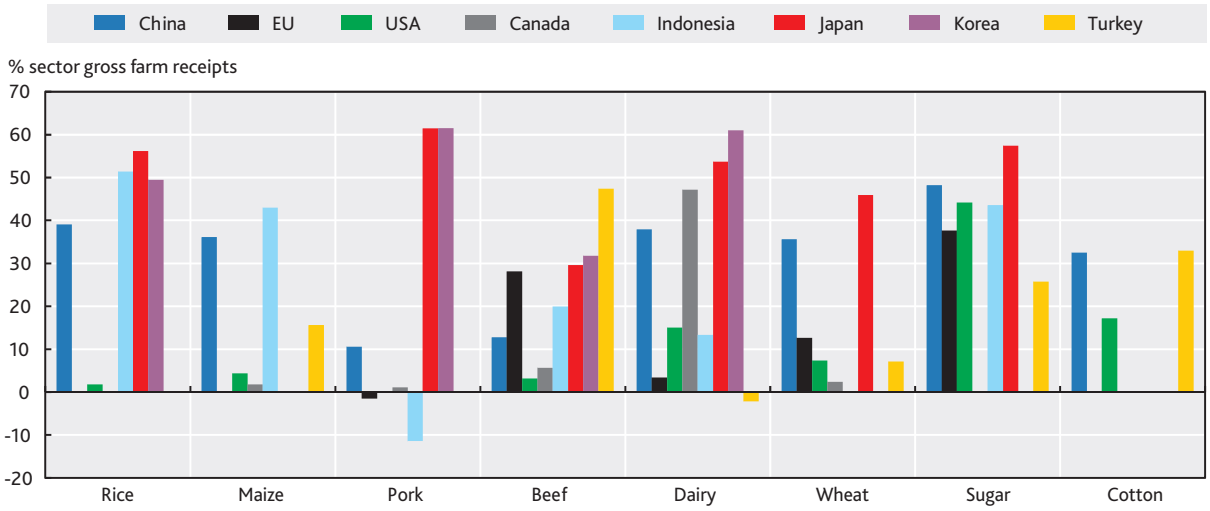
Looking at the relative support levels by individual commodities (Figure 8) reveals that the sugar industry is also relatively highly supported by a number of countries—both OECD and emerging countries. This is in contrast to cotton where, captured in the PSE database, support is predominately provided by three countries—China, the US, and Turkey.

The relative support levels also provide some context to the contribution to absolute levels of support shown in Figure 7. In particular, China, which has high absolute levels, is not the highest when looking at support in relative terms. Indeed for a number of commodities, it is OECD countries that provide the highest levels of relative support.

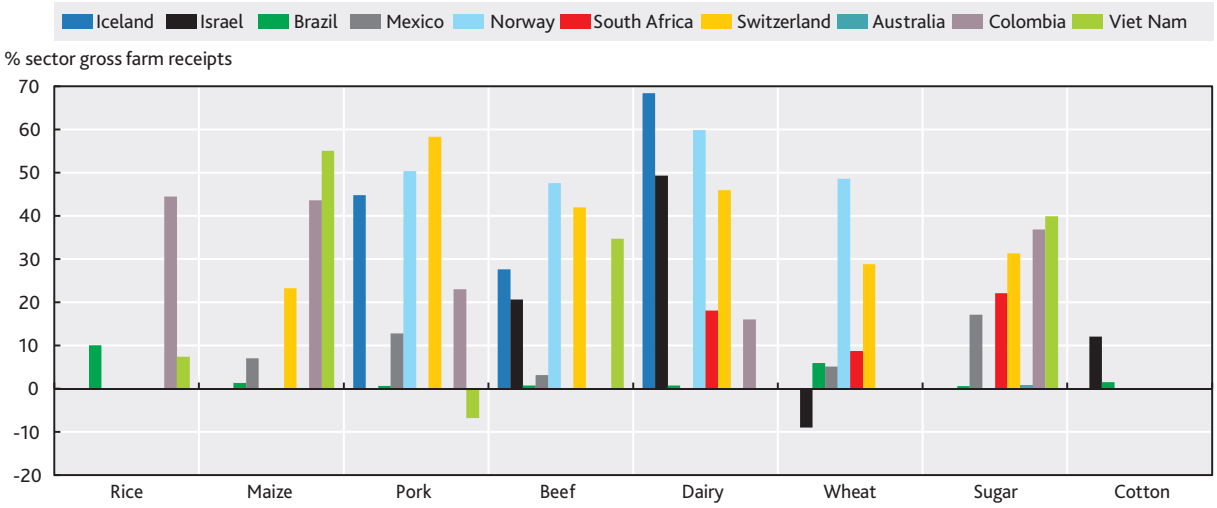
Figure 8: Relative support by country by product

% of sector gross farm receipts in each country in 2015

Main supporting countries



Other countries

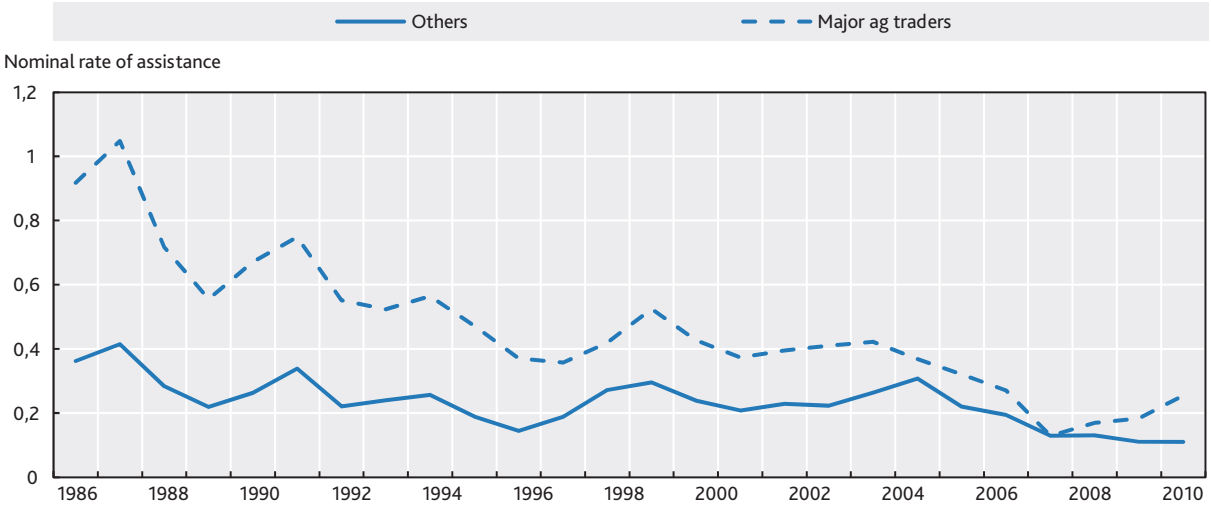


Source: Author estimates based on OECD (2016a).

World Bank NRA data also support the finding that it is the major agricultural traders who are providing the highest levels of domestic support to agriculture (Figure 9). Focusing on the top agro-food exporters and importers (those in either the top 20 exporters or top 20 importers) shows that, on average, support provided to agriculture is higher than to those outside this major trading group. Considering that the top 20 traders account for around 70 percent of total agro-food exports and imports (OECD 2016b), the impact of these distortions on trade could be significant.

Figure 9: Major agro-food traders provide higher levels of domestic support

Average NRA from output subsidies, 1986–2011



Source: Author estimates based on World Bank (2012); Anderson and Valenzuela (2013); Anderson and Nelgen (2013).

3.2 How Has the Support Evolved?

Across the main supported commodities, the composition of support has changed over time revealing a number of differing trends. Through looking at the different components of support as set out in the PSE database, changes in the way support has been provided to the five key commodities identified above (rice, maize, pork, beef, and dairy) along with wheat and sugar (due to past high levels and persistent high relative levels respectively) can be explored. The database provides the means to differentiate the support provided to individual commodities between: MPS (due to the presence of border restrictions such as tariffs along with administered prices); output subsidies (such as the deficiency payments made to maize, wheat, and cotton producers under Brazil's premium equaliser paid to the producer programme); variable input subsidies (such as Indonesia's seed subsidy); fixed capital formation subsidies (such as the US environmental quality incentives programme for conservation measures); and payments made on the basis of current area and production required (such as China's direct payment for grain producers programme).[4] Looking at the changes in the levels and composition reveals four main categories of changes (in real terms):

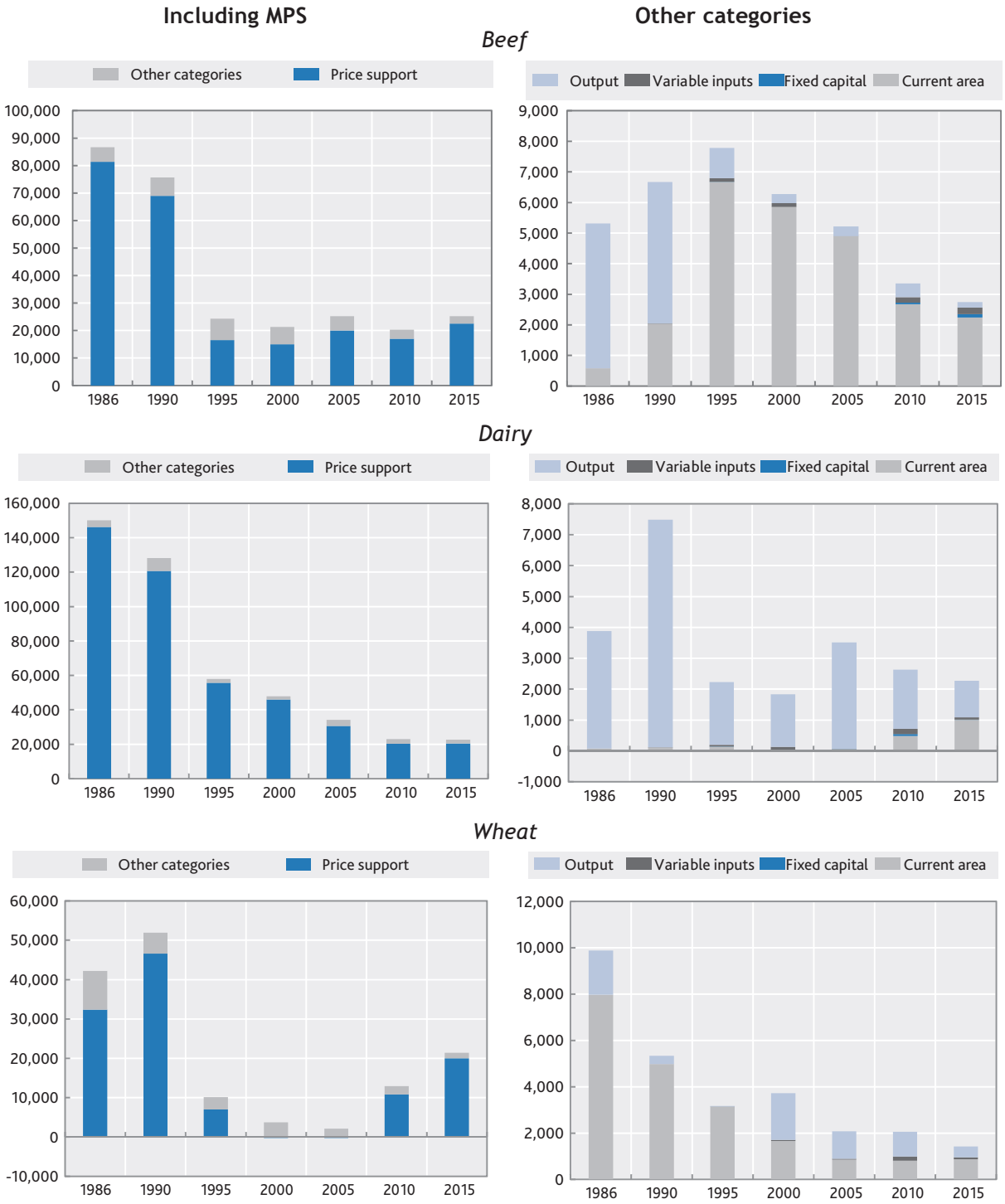
1. Falling levels of support across both MPS and other categories *(falling support)*;
2. Rising levels of MPS but falling levels of other support *(rising MPS)*;
3. Stable support across both MPS and other categories *(stable support)*; and
4. Falling MPS but rising levels of support provided under other categories *(rising direct payments)*.

Three commodities—beef, dairy, and wheat—have all seen ***falls in real support levels*** over the past 20 years (Figure 10). The major source of change for these commodities has been a reduction in MPS, falling sharply from the 1990s (although support for wheat has increased since 2010).

4 The database also provides for a further category of subsidies paid on the basis of non-current area with no production required, but for these commodities no country made use of such support payments.

Figure 10: Falling support levels for some commodities

Real values (USD) selected years, all countries

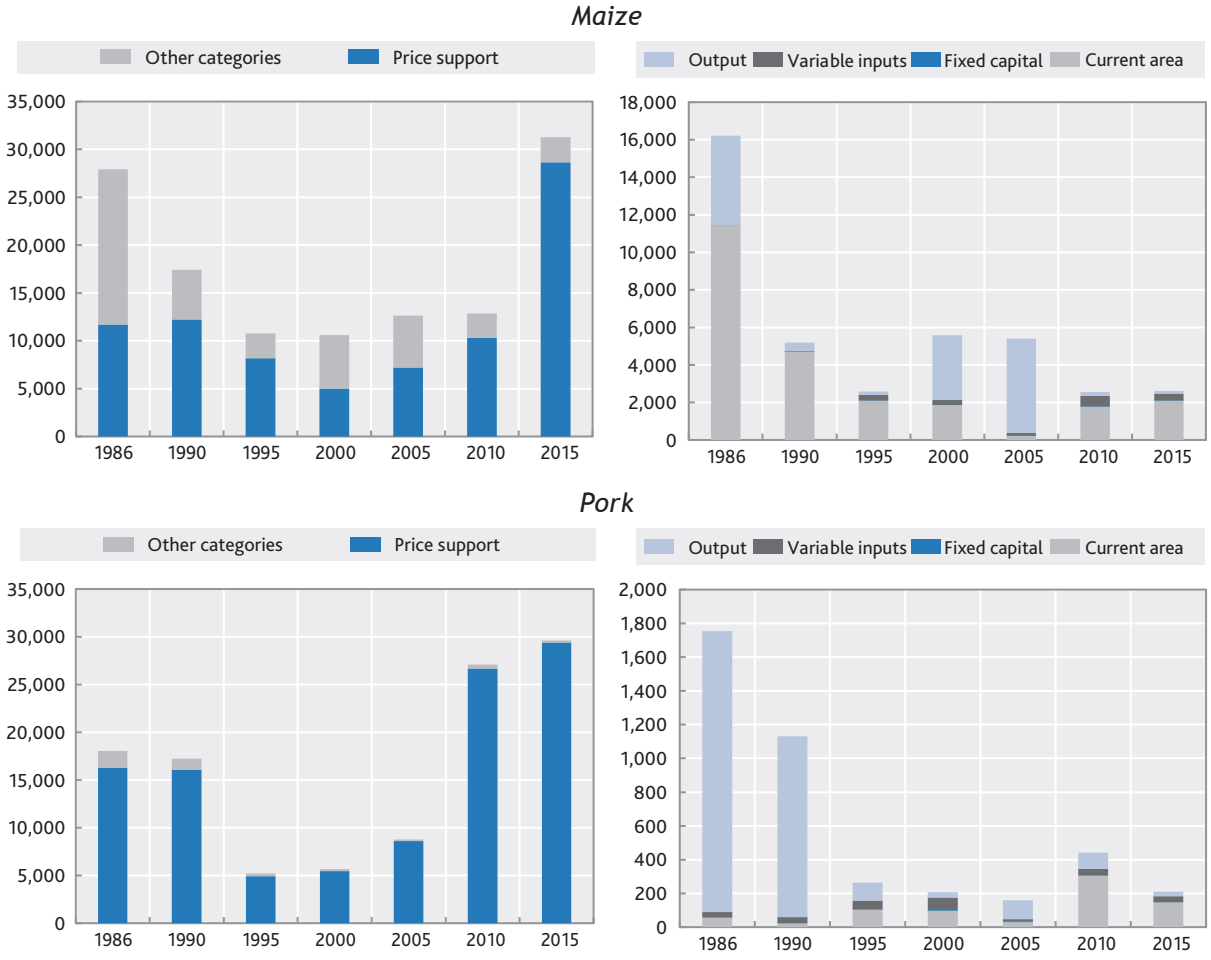


Notes: For the other categories of support, what is noticeable beyond the falling levels is a shift away from output subsidies to area-based payments (partly decoupled). The dairy sector has the highest share of remaining output subsidies but even these are much reduced from levels seen in the 1990s.
Source: Author estimates based on OECD (2016c).

The second group of commodities is those which have seen a ***shift towards MPS*** (Figure 11). This shift has been seen in the support provided to maize and to pork, and has been driven by changes in the policy stances of the major supporting countries. For maize, the changes have been driven by changing policy effects and stances in China and the US. China's MPS for maize has increased significantly over time. However, this may change as reforms are being implemented to move away from this type of support (Box 4). In the US, support has fallen and shifted away from direct output subsidies.

Figure 11: Rising MPS levels for some commodities

Real values (USD) selected years, all countries



Source: Author estimates based on OECD (2016c).

Box 4: China's evolving maize and other MPS policies

As commodity prices on international markets started to fall after 2011, the positive price gap in China between domestic and international prices widened, stocks of various commodities (grains and cotton in particular) escalated, and agro-food imports increased. In this context, in 2014–15 and early 2016, the Chinese government undertook several initiatives to reverse this trend.

For maize, the floor price for the 2015 crop for "state temporary reserves" was lowered by ¥260 (US$41) to ¥2,000 (US$317) per tonne. This was the first decline in the floor price for maize since 2007, when this system was introduced. Further reforms of the maize purchasing and storage system were announced in late March 2016 with maize prices set to be allowed to be determined by market forces and maize producers to receive subsidies to stabilise revenues. The reform will be implemented in key maize producing areas: in Heilongjiang, Jilin, Liaoning, and Inner Mongolia.

Changes were also made for other crops, with:

- Minimum prices for wheat and rice in 2015 being kept at the 2014 levels;
- The stock holding programme for cotton being abandoned in 2014–15 and switched to a trial subsidy programme based on a target price system. The new system was applied in Xinjiang province, the key cotton production area in China. The scheme provides for compensation to be paid to farmers if the price falls below a target price of ¥19,100 (US$3,193) per tonne, with payment made on the basis of certified production sold (90 percent) and certified planted area (10 percent);
- A pilot target price programme with a direct subsidy being introduced for soybean producers in the 2014/15 season in four northeast provinces of Heilongjiang, Jilin, Liaoning, and Inner Mongolia, based on the difference between the government target price and the market price as registered. For the 2015/16 season, the level of the target price in the four provinces remained unchanged from the previous year;
- The system of floor purchase prices for rapeseed for the 2015/16 season being discontinued and only partly replaced by very limited direct subsidy to farmers; and
- The floor price for sugar cane being lowered to ¥400 (US$63.7) in marketing year 2014/15 from ¥475 (US$75.6) two years prior.

The above measures have helped to stabilise domestic prices for some commodities (wheat and rice) or have contributed to falls for some others (maize, rapeseeds, soybeans, cotton, and sugar), but as international prices fell even more, the price gaps in 2015 continued to increase, with the exception of cotton, for which the price gap declined quite strongly.

Source : OECD (2016a).

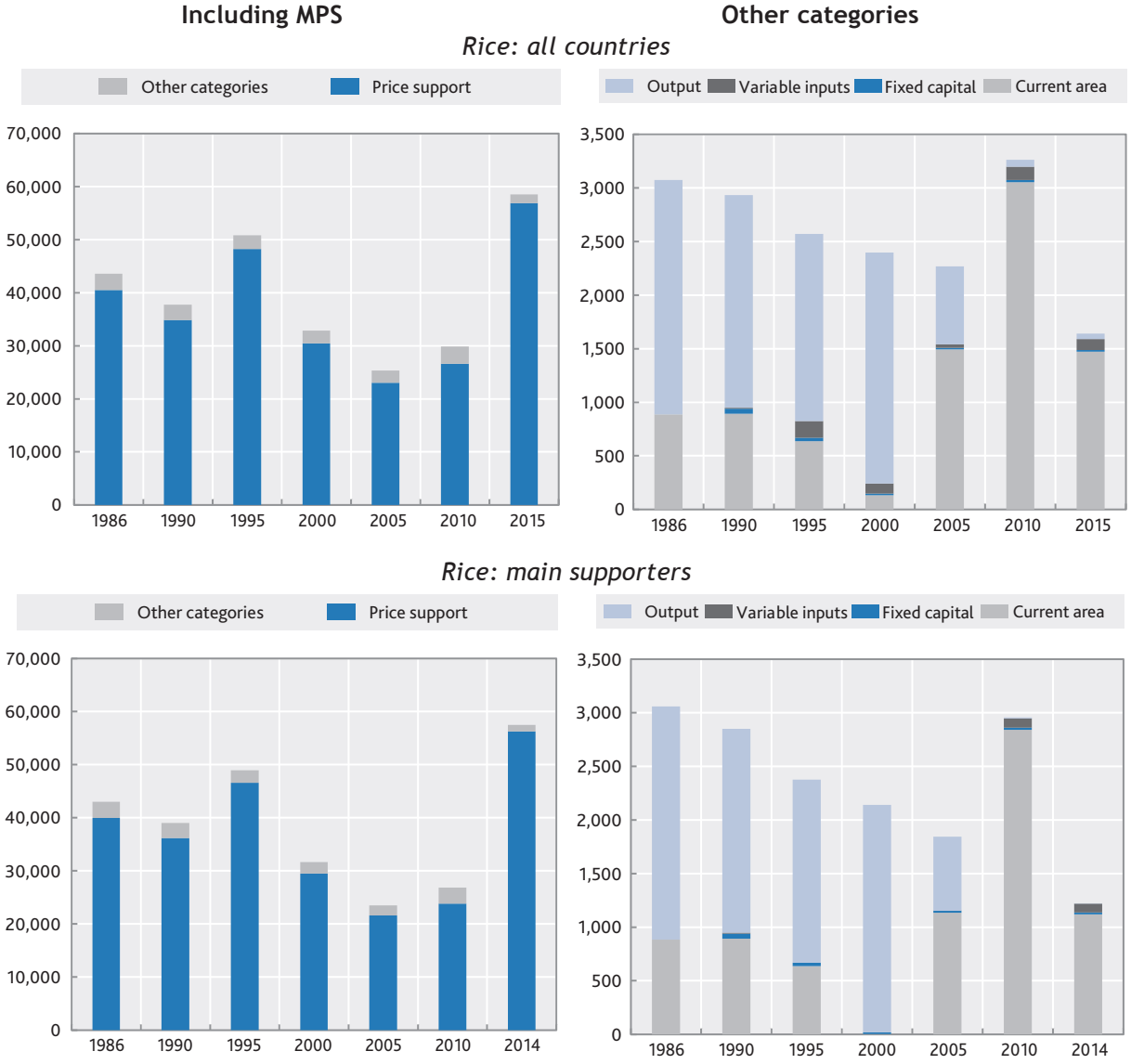
There have been shifts away from the use of output subsidies for pork (mainly in the Russian Federation) to a greater use of MPS. Increases in MPS are due to policies in place in China, Japan, and the Russian Federation.

The mix of support for rice has been relatively stable across both MPS and other domains over time (Figure 12). Support for MPS dipped during the early 2000s but has subsequently increased. However, in the main supporting

countries, MPS levels have actually increased over this period. In terms of other forms of support, levels have declined in real terms since 1986, but the changes have not been consistent. Prior to the food price spikes of 2007/08, there had been a general fall and shift away from output subsidies to area payments. However, closely following the price spikes, subsidy levels increased again, but appear to have fallen in most recent years.

Figure 12: Stable support for rice, but increasing for main supporters

Real values (USD) selected years



Notes: Main supporting countries defined over the seven individual commodities examined and include the US, the EU, China, Japan, Korea, Turkey, Indonesia, Canada, Switzerland, the Russia Federation, and the Ukraine.
Source: Author estimates based on OECD (2016c).

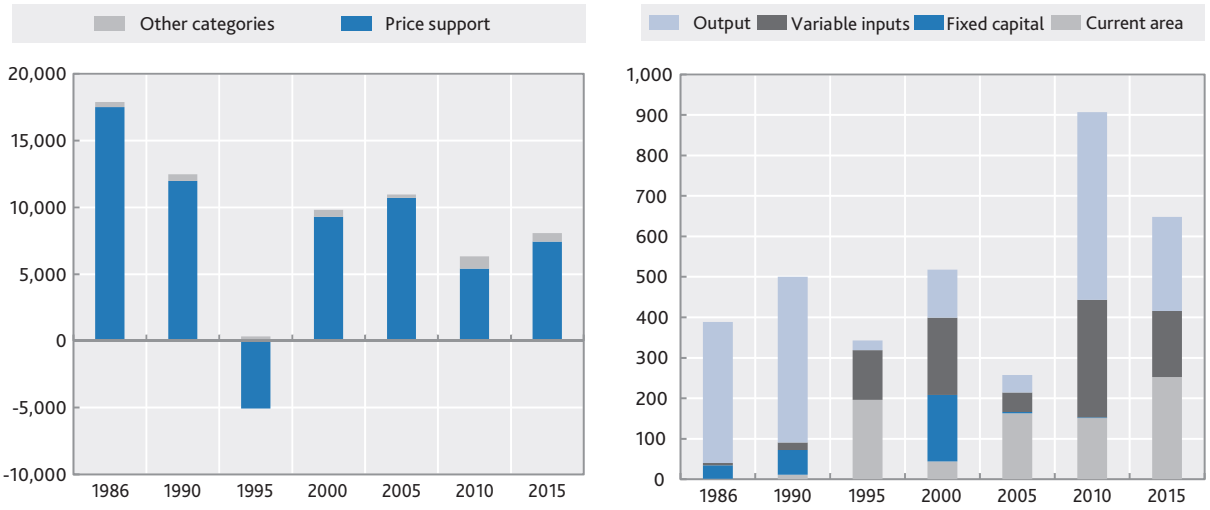
The final category of support changes relates to sugar (Figure 13). Since 1986, MPS has fallen, but support in other forms has increased. In particular, there has been an increase in the use of variable input and area payments to the industry over the period. However, in relative terms, this form of support is minor compared with MPS (which is the case across all commodities).

Figure 13: Rising levels of other support for sugar

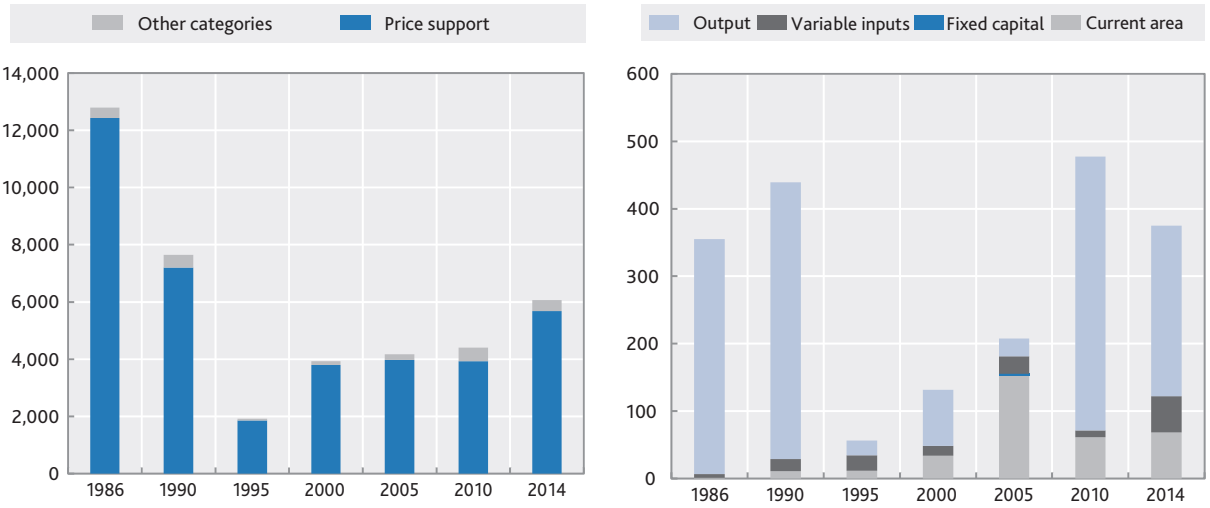
Real values (USD) selected years

Including MPS **Other categories**

Sugar: all countries



Sugar: main supporters



Notes: Main supporting countries defined over the seven individual commodities examined and include the US, the EU, China, Japan, Korea, Turkey, Indonesia, Canada, Switzerland, the Russia Federation, and the Ukraine.
Source: Author estimates based on OECD (2016c).

It should be noted that these figures do not capture movements away from single commodity support to other forms of more general support outside the observed falls in total support. It is therefore not necessarily the case that the falling levels of product-specific support to beef, dairy, and wheat are accompanied by actual falls in domestic support to the sector as a whole. Nevertheless, when moving from single commodity support to general payments (except those related to agriculture-wide inputs such as fertiliser), the forms of support used have been generally less distorting than those provided under payments directed at specific commodities.

4. IS DOMESTIC SUPPORT AFFECTING AGRO-FOOD TRADE?

The size of domestic support to agriculture, and in particular to some commodities, is significant. If the supported commodities are also those that are heavily traded, then this would suggest that levels of domestic support may be significantly influencing current trading patterns across the world.

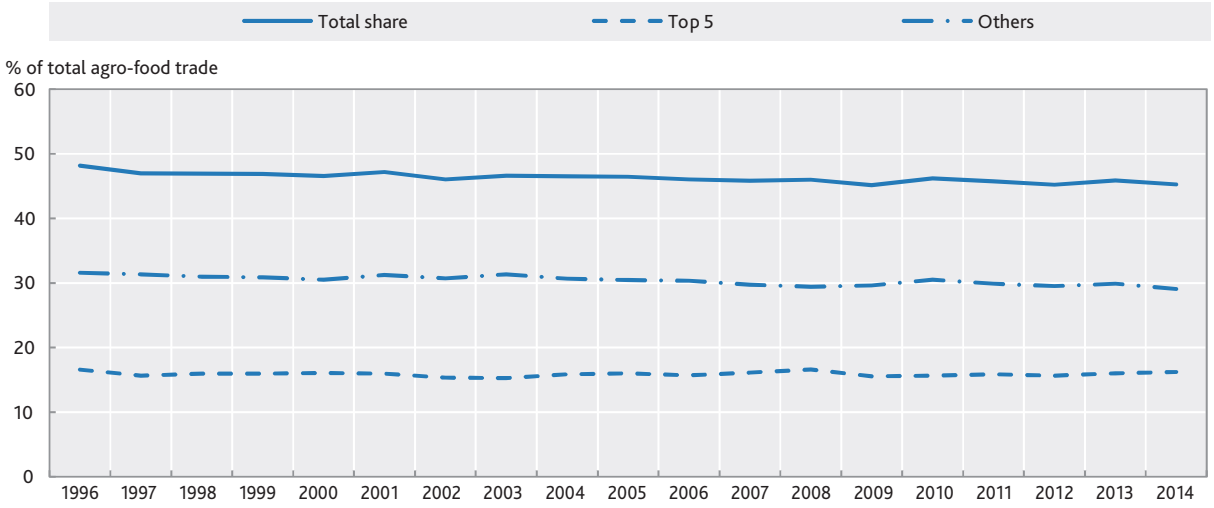
Linking the supported commodities to levels of trade reveals that many of the supported commodities are heavily traded. In fact, the top 11 supported individual commodities are also those that account for close to 50 percent of total agro-food trade by value (Figure 14). The top five supported commodities account for around 15 percent. The share of these commodities in total agro-food trade has also been relatively stable across time.

Support levels have recently increased for both rice and soybeans. At the same time, trade in these products has been growing faster than the average for agro-food overall, driven by rising productivity in a number of developing-country producers. The rising levels of support may be occurring in response to the growing competition from international markets, with some countries reacting to this pressure and taking further steps to insulate domestic producers (Figure 15).

Overall, the importance of supported commodities in total agro-food trade suggests that the domestic support policies in use by a number of agricultural producing countries could be having a significant impact on world trade and the value created from agricultural activities.

Figure 14: Share of supported commodity trade in total trade

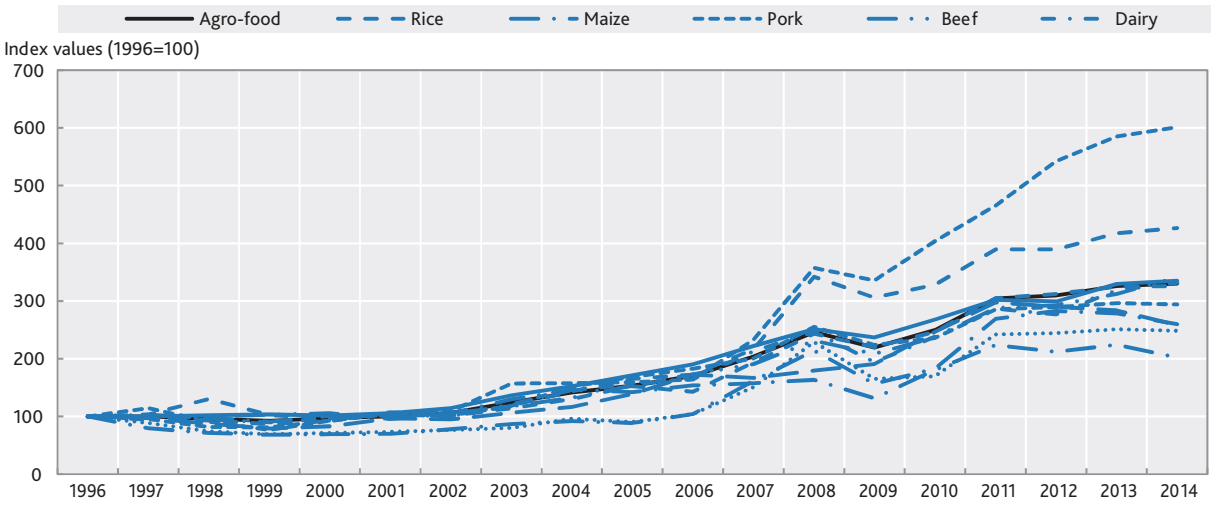
1996-2014



Source: Author estimates based on WITS (2016).

Figure 15: Changes in trade in supported commodities

Index values (1996=100), 1996–2014



Source: Author estimates based on WITS (2016).

4.1 What Might Happen if Domestic Support Was Removed?

To explore the effects on global markets of removing domestic support, a computable general equilibrium analysis was conducted making use of the Global Trade Analysis Project (GTAP) model. The GTAP database includes PSE data on domestic support provided to individual commodities (as shown above) along with that provided to individual agricultural producers in general (for example, programmes such as Indonesia's fertiliser subsidy that is not targeted to specific commodities). The domestic support data are aggregated at the individual GTAP sectors level—sectors represent broad groupings of similar commodities. Domestic support is divided across: support provided as output subsidies; that of subsidies to value-added inputs (land, labour, and capital); and that of subsidies to intermediate inputs (such as seeds and fertilisers). In this way, MPS[5] is excluded and this effect is captured by the tariff levels present in the model (although this does exclude the effects of minimum (administered) price support schemes and non-tariff measures that contribute to the MPS measured by the PSE). Given this, GTAP provides an opportunity to assess the effects of the particular domestic support policies distinct from tariffs or other barriers that limit market access—ranging from import licensing and quotas to non-tariff measures applied at the border. For this analysis, support to individual commodities in the form of subsidies paid to value-added factors of production (land, labour, capital, and natural resources), subsidies paid on intermediate inputs (products from other production activities such as machinery and fertilisers), and output subsidies has been examined. Such programmes range from direct seed and fertiliser subsidies to subsidies provided to credit and insurance products.

The way in which domestic support (excluding that provided by MPS) is likely to affect trade flows is complex. Support targeted towards inputs used in the production process has the potential to decrease costs and thereby make domestic production cheaper, allowing it to

5 In the GTAP database, all MPS is excluded from the calculation of subsidies paid to individual agricultural sectors (Huang 2013). Where MPS is created by tariffs or quotas, the effect is captured in the *ad valorem* equivalent tariffs in the database. Where MPS is created by administered prices, in the absence of trade barriers (or if a country is a net exporter), the effects are not captured in the database and the levels of domestic support present are therefore likely to underestimate the true support levels for some commodities.

displace imports. However, at the same time, interventions in factor markets (land, labour, and capital) will have effects on other non- or less-protected agricultural activities, potentially decreasing production of these products. This is because such policies make it cheaper for producers to use these factors in the protected production, and so they use more, reducing the availability (and increasing the cost) of these factors in other sectors. Alternatively, support may partly offset the factor market effects created by market access barriers in other agricultural sectors. Further, the end effects on prices can influence other agricultural activities as many agricultural products are used as inputs into the production of other agro-food products. In aggregate, such influences will have ambiguous impacts on trade depending on the nature of support provided, its targeting, and how a country that makes use of domestic support interacts with international markets.

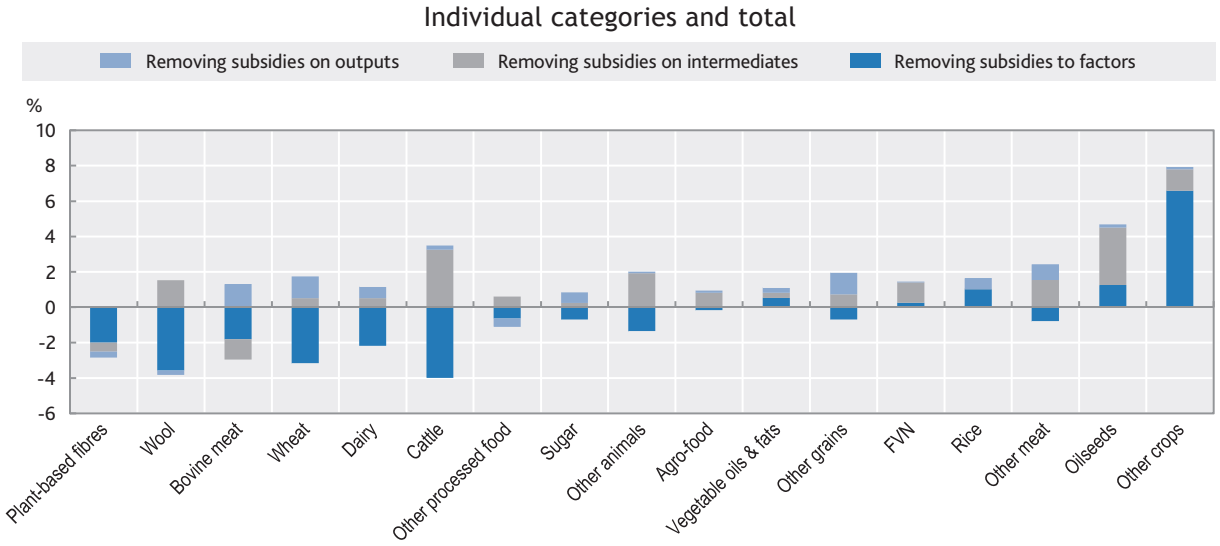
To gain insight into these complex inter-linkages, a stylised analysis was conducted which assumed that all domestic support in the form of input and output subsidies was removed. The analysis suggests that current domestic support policies are negatively affecting trade in agro-food products (Figure 16). Overall, if current domestic support policies were to be removed or restructured so as not to be market distorting, world trade in all agro-food products would increase. For the five most supported commodities, the changes in trade volumes are mixed. Overall trade for meat products would increase but this would comprise falls in trade of beef (bovine meat) and increases in the trade of other meat products (pork and poultry). Trade would be expected to increase for grains, rice, and other grains (maize). For dairy, trade volumes would fall. The increases in trade are driven by a reallocation of production worldwide and within individual countries. There would be both an increase in the production of supported commodities in countries which did not provide support and a shift to the production of other commodities in the countries where support was previously provided. The decreases, however, occur as, despite falling production in some countries as domestic support is withdrawn, supplies do not increase in other countries as changes in relative prices (and demand effects) mean that production increases are directed towards other commodities.

Figure 16: Removing domestic support is generally trade promoting

Notes: Sectors shown in red represent those which receive the highest levels of SCTs as captured in the OECD PSE database. The paddy rice, sugar cane and beet, and raw milk sectors are excluded as limited trade is observed in these sectors.
Source: Author estimates from GTAP (Hertel et al. 1997), version 9.2).

The contribution from the removal of the various forms of support to the changes in trade in each of the sectors is shown in Figure 17. As can be seen, the influence of removing support related to factors of production (land, labour, and capital) has the most complex effect on trade volumes. This is due to the interplay between the factor markets and changes in relative returns from price changes (both output and input) when support is removed. It should also be noted that the changes modelled occur in the absence of changes in MPS, the most significant component of support to these commodities, leading to a series of second best options—that is, some changes that occur may actually lead to worse outcomes for economies if they encourage additional production in areas where there are large distortions from MPS. Indeed, when coupled with MPS reforms the trade changes can be significantly different (as discussed below). Further, a number of factor-based payments are linked to other objectives—in particular, to overcoming environmental externalities. This means that such payments may correct for some negative effects of production and lead to better outcomes in the presence of an open trading environment. Thus from a broader perspective, other market failures may justify their presence.

Figure 17: Contribution to global trade changes from subsidy removal



Source: Author estimates from GTAP (Hertel et al. 1997), version 9.2).

For some products examined, such as plant-based fibres (e.g. cotton), the overall change in trade masks some significant compositional changes. In particular, the removal of domestic support in these sectors leads to a shift in production to African countries in particular, which increases trade volumes sourced from these regions.

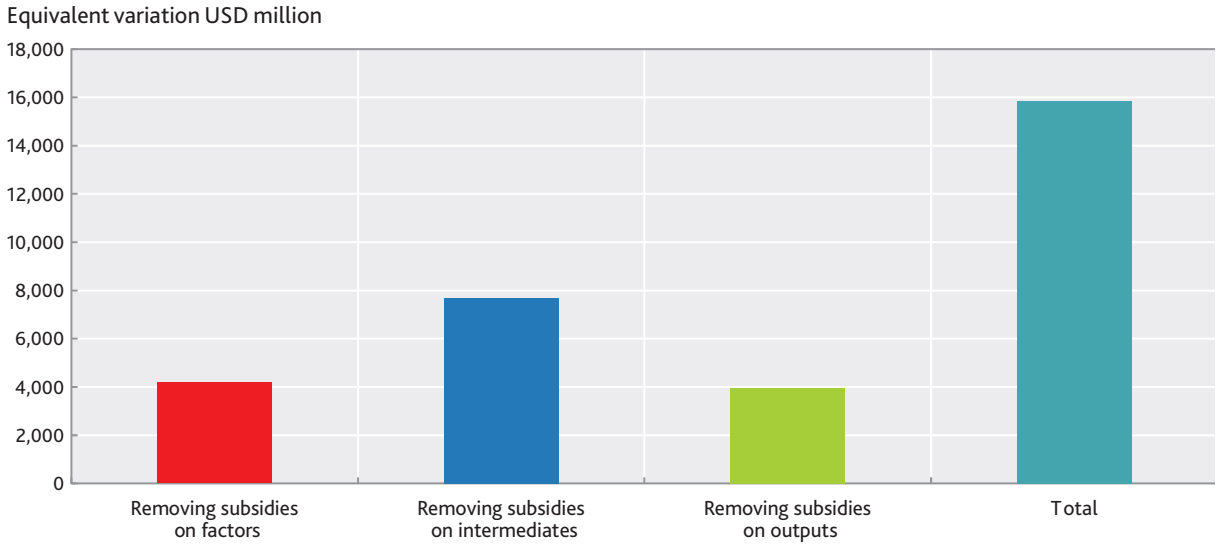
Overall, the reallocation of production and government expenditures has welfare impacts globally and on the economies involved. Globally, moving away from distorting forms of domestic support improves welfare (Figure 18). This is due to the removal of intermediate input-related subsidies (such as feed, fertilisers, and equipment), followed by the removal of subsidies on factor inputs (land, labour, and capital). The impact of output subsidy removal is smaller due to the lower use of this type of policy instrument globally.

The results vary across countries. As the analysis only explored domestic support in agriculture, other distortions, such as tariffs and policies directed at other sectors of the economy, remain in place. This shift to potentially more distorted activities in the economy has negative effects on welfare. Furthermore, not all factors of production are perfectly mobile. Land, in particular, cannot seamlessly move from one production activity to the next. Therefore, removing support can mean that the returns

to owners will fall as it becomes "stuck" in certain sectors. This results in losses in incomes for certain households, and similar effects can occur for labour. The results indicate that some households will lose out from reforms and therefore other policies will need to be in place to help with the adjustment pressures that will result, and to provide safety nets for those most severely impacted and with least access to other coping mechanisms.

Figure 18: Contribution to global welfare changes from subsidy removal

Individual categories and total



Source: Author estimates from GTAP (Hertel et al. 1997), version 9.2).

Beyond the influence on trade and welfare, domestic support is also likely to negatively influence the development of agro-food global value chains (GVCs) and the benefits that are created from participation in them (Box 2). Past studies of GVCs have found that their development has increased opportunities for economic activity within a country due to increased opportunities to access new markets and gains in competitiveness from the use of more efficiently produced inputs, along with potential productivity gains resulting from spillovers in the value chain (OECD 2015b; Lopez-Gonzalez 2016). With increased economic activity, and possible flow-on effects on productivity, GVC participation has increased domestic value added (DVA) and job creation within economies.

A recent study looking at global agro-food value chains in detail, the influences on participation in them, and the benefits created from being involved has found that the nature of domestic support matters (Greenville et al. 2017). In particular, support that is provided in a non-distortionary fashion—especially support related to general services that contribute to the enabling environment for the sector (such as research, development and extension systems, and agricultural infrastructure)—helps promote GVC engagement. Similarly, non-distorting support provided to producers (that which has limited effects on output) can also increase GVC participation. However, distorting support, while increasing links with ongoing export markets (one part of participation), decreased the domestic returns from GVC participation. Essentially, distorting domestic support reduced the gains to the sector that were available from GVC participation (Box 5).

For GVCs in agriculture, a range of other factors also play a role in determining the outcomes for individual producers. Mather (2008), for example, points to the development of value chains across four different tropical crop sectors and points to the growing importance of buyer-driven standards in organising the value chain. In particular, producers who supply supermarkets are under pressure to meet a range of food safety, social, and environmental

standards. Such standards shape who can participate in these chains and therefore the outcomes that are achieved. Further, other research has pointed to differences in market power between value chain participants decreasing the potential for spillovers to be generated for smaller suppliers in the value chain (Humphrey and Dolan 2004).

Box 5: Domestic support also hinders GVC development and benefits

The role of agricultural support on global agro-food value chain engagement and the DVA created was explored by making use of the OECD's data collected in its annual Monitoring and Evaluation of Agricultural Policies data (OECD 2016a). The analysis examined the effects on backward and forward participation, and DVA of the most distortionary payments to individual producers (those related to outputs, MPS, variable input use, and current area where production is required); least distortionary payments to individual producers (such as those for the provision of environment services and other decoupled payments); and general services support to the sector. Payments to individual producers were expressed as a percentage of gross farm receipts while general services were expressed as a percentage of GDP. The individual payments represent the components of the PSE while the general services payments represent those captured by the General Services Support Estimate. A number of other structural and policy control variables were also included in the model (see Greenville, Kawasaki, and Beaujeu 2017).

On backward participation (i.e. sourcing inputs for exports from other markets), while the effects of individual categories of payments were not significant, the share of general support payments in total support provided to the sector was. The correlation suggests that agricultural support policies geared towards general support payments are likely to promote backward participation in GVCs—that is, supporting the agricultural sector through non-distortionary means and providing services that have been found to promote competitiveness increases participation in GVCs. Indeed, in the benchmark model one aspect of the general services support, that of agricultural research and development (R&D), was found to be associated with higher levels of GVC participation.

On forward participation (selling into value chains through exporting intermediates that are used in another country's exports) and DVA creation, the results are more complex. For forward participation, all payments (distortionary, non-distortionary, and general services) were correlated with higher levels of participation. However, higher levels of distortionary payments decrease the DVA creation from GVC participation (a negative correlation)—that is, while distortionary payments increase forward participation, likely through subsidies to output, they decrease the domestic returns from being part of global agro-food value chains (as the subsidy is effectively a tax on other contributing sectors). In this sense, increased GVC participation is not associated with better outcomes (in terms of DVA) for the economy. But for least distortionary payments, the participation effect does not come with a negative effect on DVA creation. It is possible that these payments are allowing producers to enter value chains either through correcting market failures they face or by allowing them to produce in a more sustainable and traceable fashion. In this way, they do not take away from the benefits created (in terms of DVA) from GVC participation.

While there are links to increasing participation (both backward and forward) for general services provided to the sector, no relationship was found with DVA creation. Despite this, from broader analysis for a larger number of countries, it was found that agricultural R&D intensity was related to higher DVA creation indicating that at least in part there is also a

Box 5: *Continued*

link to improving value-added creation. The lack of significance in this instance is likely to be related to the range of other measures included, which in some instances also pick up support for public stockholding.

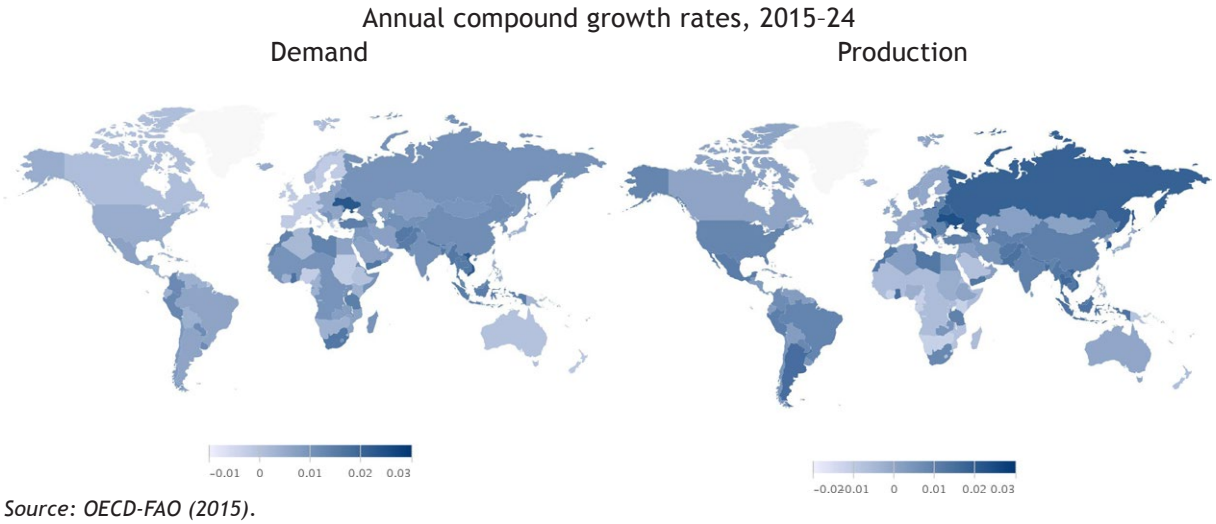
Table 1. Influence of domestic support on global agro-food value chain participation

	Backward	Forward	DVA
Most distorting support	n.s	Positive	Negative
Least distorting support	n.s	Positive	n.s
General services to agriculture	n.s	Positive	n.s
Share of general service support in total support	Positive	n.a	n.a

Notes: n.s is not significant; n.a is not applicable.
Source : Greenville et al. (2017)

Removing support has the potential to have longer-term benefits beyond those related to a better use of resources or the promotion of GVCs. Support is currently targeted at many areas of future demand growth. For example, both meat and dairy consumption are expected to increase over the medium term due to increases in incomes and higher living standards across the world. As the location of this increase in demand does not match the areas of projected production growth (Figures 19 and 20), trade will become more important in reallocating goods from surplus to deficit regions. The rising demand levels for these products (and imbalances between supply and demand) suggest that distortions in these markets, if they were to continue, would have even greater negative effects on welfare in the future.

Figure 19: Projected demand and production growth for meat

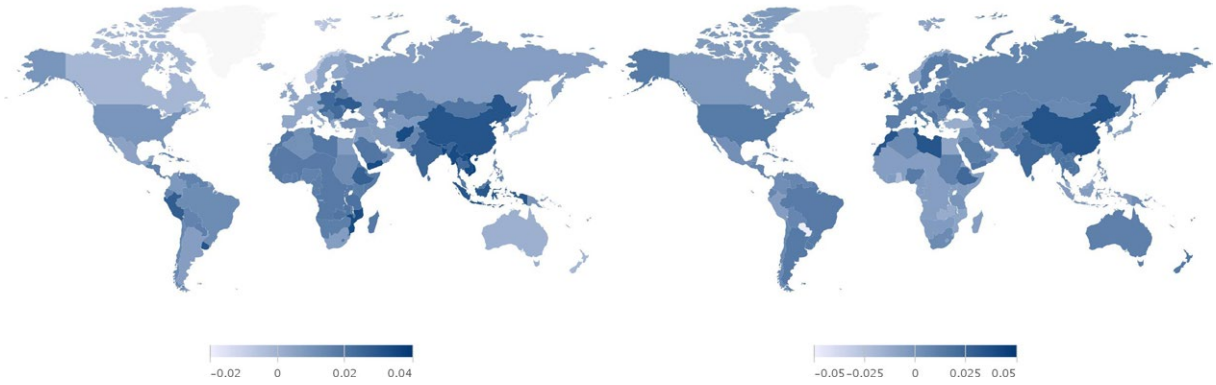


Source: OECD-FAO (2015).

Figure 20: Projected demand and production growth for dairy

Annual compound growth rates, 2015–24

Demand Production



Source: OECD-FAO (2015).

Beyond demand, there are also uncertain future factors related to climate change. Climate change will alter production patterns and variability on both a domestic and international scale. For individual countries, it is likely that food production will become more variable, with changes also possible in land use and the variety of products produced domestically. Trade openness, including removing the distortions related to domestic support, can allow countries to secure supplies from a wider range of producers, who are likely to face different climate risks than those faced by domestic producers (Greenville 2015). Further, current domestic support policies can create incentives to maintain the status quo in terms of production mix which can actively work against adaptation efforts by producers, increasing their exposure to climate change-related risks.

5. WHAT STEPS CAN BE TAKEN TO REDUCE TRADE-DISTORTING DOMESTIC SUPPORT AND WHICH ARE THE MOST IMPORTANT?

The analysis of domestic support indicates that the government support in factor markets and directed towards output has influenced global markets and global welfare. Past trends for some commodities show that in some countries, policies have begun to shift away from such measures, in particular those of direct output subsidies. Further, the agreement reached at the WTO's tenth ministerial conference in 2015 to prohibit the use of export subsidies should help reduce the impact such subsidies have on international markets as this decision essentially caps the use of output subsidies. No longer can output subsidies create a situation of excess supply which can then be disposed of on international markets (which would require the use of an export subsidy). Therefore, the impact of output subsidies, however delivered, is limited to the displacement of imports.

The flat-to-creeping levels of support in these categories suggest that tightening the controls on them is a priority for multilateral negotiations. Even reducing current allowable limits within the use of distorting domestic support is likely to be beneficial in offsetting the potential for future increases to occur.

Greater caution is needed for policies that directly target value-added factors. Domestic support policies need to be able to reduce or limit the negative effects of market failures effectively but, at the same time, avoid becoming direct output subsidies themselves. In this light, the maintenance of some flexibility within the disciplined policy is desirable (such as that related to decoupled or mostly decoupled payments). Further, for policy makers, removing distortions in this area can have direct distributional effects on households that need to be addressed.

Beyond domestic support, the results indicate that the policies in use elsewhere in the sector and the economy are also important. The movement of resources to other distorted areas of the sector or economy that occur with the reductions in domestic support can limit or undo some of the benefits. Therefore efforts should also be focused on other areas of the reform agenda (discussed further below).

5.1 The Right Kind of Support Remains Important

Not all support provided to the agricultural sector has either trade-distorting or negative welfare effects. Domestic support that is provided in a non-distortionary manner and focuses on the provision of public goods has the potential to improve welfare.

Recent work on GVC participation and exploring the factors that influence the benefits created, highlights that both general services support to the sector and R&D expenditure, in particular, have positive influences (Greenville et al. 2017 forthcoming). Further, supporting the sector to be able to contribute to climate change mitigation efforts and allow it to adapt to climate change will be important in ensuring that past trends in productivity growth continue and allow the sector to meet the demands of a growing population. In particular, the role that R&D has played in promoting productivity growth in agriculture over time has been well documented. However, Kristkova, Van Dijk, and Van Meijl (2016) show that if past relationships were to hold into the future, current declines in R&D investments will mean the assumption of yield growth that underpin many models exploring the possible impacts of climate change are overly optimistic. This highlights the need for additional action beyond the current trend of R&D investment in the sector.

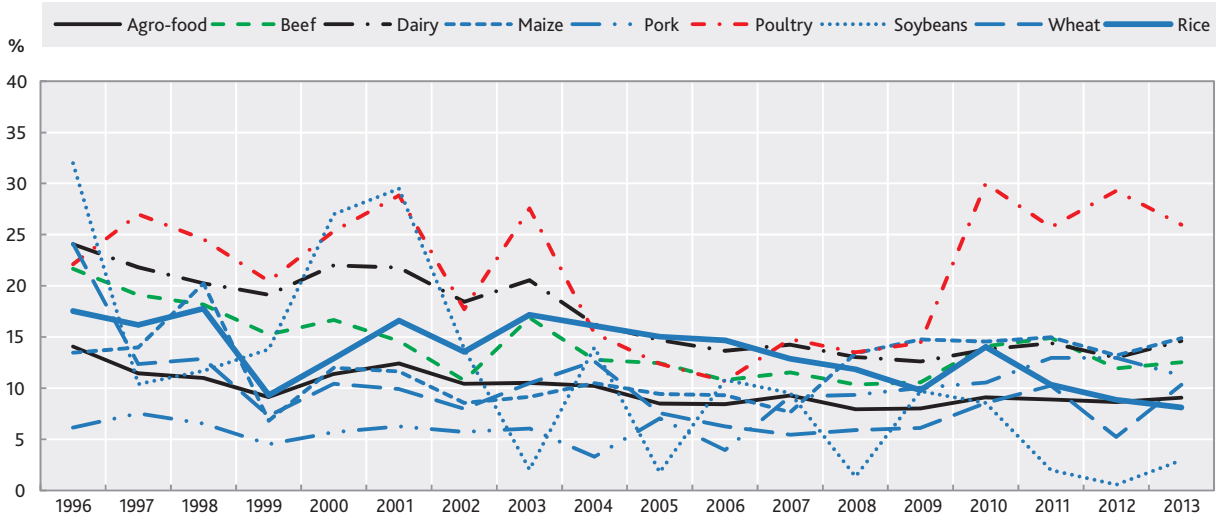
5.2 Market Access Remains a Critical Ingredient

Along with a focus on domestic support, there should be continued efforts to address the distortions driven by market access restrictions. The commodities that receive most support as captured in the PSE database are also ones where

market access is restricted significantly (Figure 21). For many of the commodities highlighted, average applied tariffs exceed those of the average for all agro-food products worldwide.

Figure 21: Relatively high tariffs exist on supported commodities

Average applied tariffs by commodity, 1996-2013

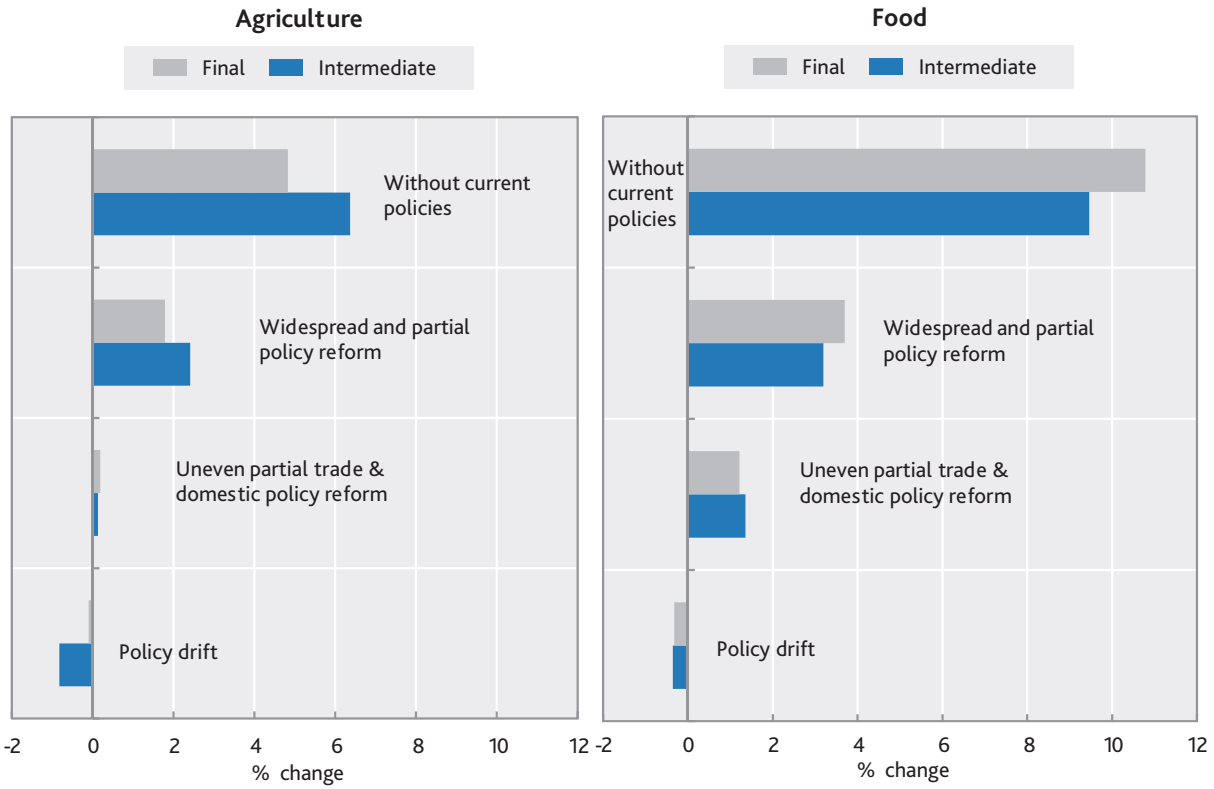


Source: Author estimates based on WITS (2016).

Recent OECD analysis indicates that together, domestic support and market access restrictions continue to create significant distortions to world markets (OECD 2016b). Further, there remains much to be gained from pursuing reform. Four scenarios were explored in the study: *without current policies*, which represents the removal of all trade-related and domestic support to agriculture; *widespread partial policy reform*, which represents the partial removal of trade-related and domestic support across all countries worldwide; *uneven partial trade and domestic policy reform*, which sees partial removal of trade-related and domestic support in developed countries with very limited changes in others; and *policy drift*, which sees some large emerging agricultural producers increase tariffs and domestic support while other countries maintain their current policies.

The results show that both domestic support and market access policies play a role in influencing agro-food trade and welfare. In particular, beyond the trade effects, removal of domestic support and trade barriers promotes global welfare, production (agro-food products overall), and trade. Further, the study highlights that more uniform action, by both developed and developing countries, enhances the gains on offer significantly (Figure 22).

Figure 22: Doing things together increases the effects on trade



Note: Four scenarios were explored in this study: without current policies, which represents the removal of all trade-related and domestic support to agriculture; widespread partial policy reform, which represents the partial removal of trade-related and domestic support across all countries worldwide; uneven partial trade and domestic policy reform, which sees partial removal of trade-related and domestic support in developed countries with very limited changes in others; and policy drift, which sees some large emerging agricultural producers increase tariffs and domestic support while other countries maintain their current policies.
Source: OECD (2016b).

For developing countries, the benefits on offer from reforms are more critically linked to the actions of other developing countries than those of developed countries. Indeed, the effects for developing countries from their own liberalisation and actions from other developing countries have a greater impact than the effects of developed country reforms. Critically, the results suggest that the development of GVCs in these countries could be significantly hampered by current policies.

Further, simulations of possible policy drifts, based on trends that have already been observed, show that inaction can lead to losses. There is therefore value in preventing drifts by "locking in" reforms already undertaken as well as in the benefits that are created from agreements for further reform. The recent WTO agreement reached in Nairobi in 2015 takes some steps in this direction (Bellmann and Hepburn 2016), but more are needed.

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