Chapter 3

Impacts of current agricultural policies and potential impacts from reform

This chapter explores the impacts of current agricultural domestic support and trade policies on markets and countries along with a number of scenarios looking at both reforms and increases in protection. First, the chapter sets out the modelling approach used in the study. Second, the impacts of current policies on production, trade and the economy are presented. Third, a closer look at the impacts of current policies on individual international agricultural markets and prices is presented. Fourth, the chapter presents possible multilateral reform scenarios, including one of increased protection.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law

3.1   Introduction

The modelling of the impacts of policies on markets and economic activity invariably requires a number of assumptions to be made. Moreover, characteristics of particular policies, or a lack of information on the economic effects of policies, add further complexity to the task. These factors often reduce the analysis of policy impacts to a narrower set of policy variables. This study is no different. That said, there have been significant developments within this narrower set of policies, which coupled with changes in markets warrants a re-inspection of the potential distortions created in agricultural markets.

This chapter sets out the modelling approach used and the results of the assessment of current agricultural policies along with a number of reform scenarios.

3.2   Modelling the impacts of agricultural policies and potential impacts from reform

The modelling of policy impacts and reform scenarios concentrates on border measures (tariffs, quotas and export taxes and subsidies) and domestic support policies (Box 3.1). The general equilibrium effects of policies and reform are explored through the OECD METRO model (Box 3.2). METRO is a CGE model designed to analyse trade policies. Market level impacts on world prices and trading patterns are explored through the OECD-FAO AGLINK-COSIMO model.

Box 3.1. What policy measures are modelled?

In the scenarios used in the study, the policy measures explicitly modelled include:

- domestic support to agriculture in the form of subsidies/taxes paid to land

- domestic support to agriculture in the form of subsidies/taxes paid to labour

- domestic support to agriculture in the form of subsidies/taxes paid to intermediate inputs into agricultural production

- domestic support to agriculture in the form of subsidies/taxes paid on outputs

- tariffs applied to, and ad valorem equivalents of all quota arrangements on, agro-food products and selected processed agricultural products (dairy, sugar and vegetable oils and fats)

- export subsidies applied to agricultural products and selected processed agricultural products (dairy, sugar and vegetable oils and fats).

METRO breaks down production and trade of commodities according to use – intermediate, household, government and capital consumption. The differentiation of commodity supply, and thus the resulting trade flows, by use category improves the ability to depict and analyse, amongst other things, global value chains through relative changes in intermediate final goods trade, allowing for a more nuanced understanding of the possible impacts of trade reform.

The model has a number of elements related to market access (tariffs and tariff equivalents) and domestic support making it well suited for the analysis of agricultural reform. The model structure is described in detail in OECD (2015).

The METRO database employed in this study is based on the GTAP 9 database, with a base year of 2011. As such, all estimates derived are in constant 2011 USD terms. For this analysis, it has been assumed that the balance of payments for a given country remains fixed after the policy shock, meaning that changes in the real exchange rate occur in response to any changes in the prices of exports or imports. Government balance is assumed constant and expenditure predefined. The government balances income changes by variation of the income tax rate. The volume of investment is fixed and savings adjust to investment, all factors are fully employed and mobile across sectors.

Box 3.2. About the METRO model

The OECD Trade Model, METRO, is a computable general equilibrium (CGE) model derived from the Social Accounting Matrix (SAM) based CGE model GLOBE developed by Scott McDonald, Karen Thierfelder and Terrie Walmsley (McDonald et al., 2013) using GAMS software. The model is a direct descendant of an early United States Department of Agriculture model (Robinson et al., 1990) and NAFTA (Robinson et al., 1993) and follows trade principles from the 1-2-3 model (de Melo and Robinson, 1989; Devarajan et al., 1990). Namely, these models divide an economy into tradable and non-tradable goods and link domestic and world prices through the tradable sectors. The model is calibrated using an augmented Social Accounting Matrix (SAM) version of the GTAP database (for v8 see Narayanan et al., 2012).

The novelty and strength of METRO lies in the detailed trade structure and the differentiation of production and consumption commodities by use – intermediate, household, government and capital consumption. The differentiation of commodity supply, and thus the resulting trade flows, by use category improves the ability to depict and analyse, amongst other things, global value chains (GVCs). In addition, this structure allows the modelling of policy instruments targeting specific uses, such as resource-based restrictions, local content requirements, and government consumption.

The model is based on a series of regional SAMs, derived from the GTAP database, linked through trade relationships. This database identifies agents (households, production units and government) and serves as a base to which to calibrate the model. In addition, the database contains a series of elasticities, including substitution elasticities governing the interaction of imports or exports and domestic commodities, the Constant Elasticity of Substitution (CES) elasticities of the production functions, income elasticities of demand and the Frisch (marginal utility of income) parameter. Finally, the database contains taxes and tariff information on a national and bilateral basis, respectively

Source: OECD (2015), www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP(2014)24/FINAL&docLanguage=En).

The scenarios explored

To assess the impacts of current policies and reforms, a number of scenarios have been explored.

1. Assessing the **current impacts** of policy measures: this scenario explores the impacts of the application of current tariffs and quotas, export subsidies and production distorting domestic support (see Box 3.1) across all agricultural markets (23 regions, 26 sectors and 9 value added factors were modelled – see Annex 3.A1 for full list). The base year for analysis is 2011 and so the scenario represents the policies and market conditions of that time with the exception of export subsidies in the European Union which are taken as zero (this also applies for the scenarios described in ii and iii). The simulation is set up as counterfactual, removing all agrofood measures. It does not explore changes in other policies such as non-tariff measures, behind the border barriers, export restrictions and credits or state trading.

2. Exploring the impacts from **trade and domestic policy reform** that might feasibly be achieved via a multilateral agreement at the WTO, in terms of improvements in market access and a reduction in domestic support. The complete removal of agricultural tariffs and the complete winding back of domestic support is an unrealistic proposition for any possible multilateral reform effort. However, it could be expected that some reform to these arrangements is possible. Whilst keeping away from assessments of past and possible specific modalities, some insights can be gained into possible effects of multilateral reform by examining a stylised reform scenario. This scenario represents a situation where modest effort is made in reforming distortions to agricultural markets through the multilateral system. The scenario depicts both changes to border barriers (tariffs and quotas) and domestic support. The success that has already been achieved at MC10 with the removal of export subsidy (see Box 3.3 for further details) is included in part with the exception that European Union subsidies are already removed in the base. The reform scenario assumes:

   • Tariffs (and tariff equivalents for quotas and tariff-quotas) on all agro-food products in developed countries (excluding Japan) being reduced by a uniform 50% with the same cut

applied to domestic support.[1] Export subsidies, where relevant, are set to zero. For certain developed countries, some sectors are subjected to smaller levels of reform with:

- Tariffs (and tariff equivalents for quotas and tariff-quotas) on all agro-food products in Japan being reduced by a uniform 25% with a similar cut to domestic support. Rice is exempted and only a 5% cut applied.

- Sugar in the United States is exempted and only a 5% cut applied.

- Dairy is exempted in Canada and only a 5% cut applied.

- Tariffs (and tariff equivalents for quotas and tariff-quotas) on all agro-food products in all other countries being reduced by a uniform 10% with the same cut applied to domestic support. Export subsidies are, where relevant, set to zero.

- As an extension to this scenario, the situation where developing countries apply the same cuts as developed – that is a 50% cut instead of 10% – is explored. This extension is referred to as "**policy reform all**".

3. Exploring the impacts of a "**policy drift**" scenario which compares a situation where an agreement is reached that locks in current levels of *applied market access* and *domestic support* to a situation where interventions in agro-food markets increase (both in terms of reducing market access and increases in production and trade distorting support). This scenario effectively represents an agreement on removing the difference between bound and applied tariff levels and maintains current rates of domestic support – that is, it maintains the status quo in terms of agriculture trade and domestic support policy. The policy drift scenario is then defined as a situation where tariffs (and tariff equivalents for quotas and tariff-quotas) on agro-food products increase by 25% in the People's Republic of China (hereafter "China"),[2] Indonesia, India, Malaysia and the Russian Federation with increases in domestic support based on changes that have been seen in the PSE for China and Indonesia over the period between 2011 and 2014 (with the average applied to the remaining as PSE estimates do not exist). For all other countries, the status quo is maintained. Specifically, this means that for:

- China, where PSE estimates have increased from 10.3% to 20.2%, a 100% increase in output subsidies is applied. Domestic support provided to production inputs is increased by 30% in line with actual changes.

- Indonesia, where PSE estimates have increased from 15.1% to 23.3%, a 54% increase in output and input subsidies is applied.

- The Russian Federation, where PSE estimates show a fall from 14.9% to 8.9%, output and input subsidies are kept the same which assumes that domestic support has increased by 67% compared with the support it provided in 2011.

- India and Malaysia, the average PSE increase for the group is applied which represents a 50% increase in output and input subsidies applied to agriculture.

In assessing the current impacts of agricultural policies, both the METRO and AGLINK-COSIMO models have been used. The METRO model has been used to assess the other reform scenarios. The AGLINK-COSIMO is used to assess to assess the impacts on prices in key agricultural commodity markets. In all scenarios, a range of sensitivity tests on parameters and market clearing assumptions have been conducted (details are set out in the appendixes).

Recent developments in agricultural markets make the policy drift scenario relevant. OECD PSE estimates for some emerging economies show a trend towards increased domestic support (Chapter 2). Further, recent actions by countries such as Indonesia show that unilateral increases in tariffs across of a range of agricultural products are a real possibility – particularly as the focus on self-sufficiency for food security is a facet of the domestic policy settings of a number of countries.
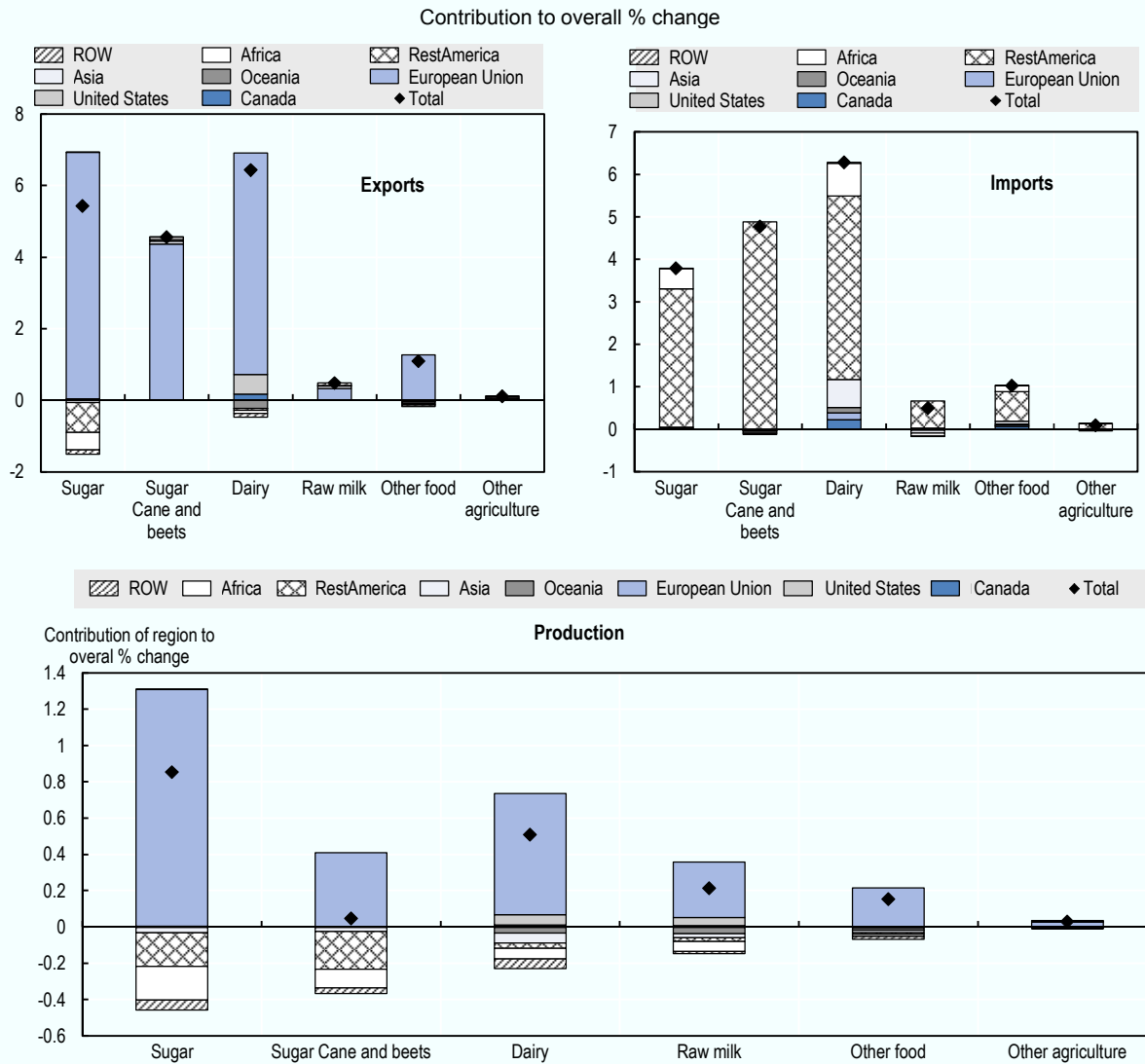
Box 3.3. Benefits from locking in the removal of export subsidies

With the agreement reached at MC10 on export subsidies (Box 2.4) it is worth exploring the possible benefits from the agreements to remove export subsidies for agricultural products. One of the more significant changes witnessed since 2001 has been the reduction in, and even removal of, a number of export subsidies. These changes, in part, reflect high prices on international markets, but are also as a result of policy reforms.

The agreement reached at the WTO should both foster further reforms to allow world markets to function more efficiently, but also help 'future proof' the world trading system. With pressures on agricultural production systems growing from increasing populations, changing consumer tastes on the back of rising incomes, and uncertain impacts from climate change, locking in the removal of export subsidies should provide significant benefits and increase the resilience of world agricultural markets, and, ultimately the resilience of world food supplies.

The challenges of climate and rising demand will mean that, in future, more consumers will rely on internationally sourced products to meet their food needs. This will be either through the direct provision of final consumption goods, or through intermediate products delivered to global value chains. World markets will need to deliver messages to producers through prices so that production occurs in areas where it is most efficient and sustainable to do so, and so that it can respond and move in reaction to changing climates. The removal of export subsidies should aid in addressing these challenges.

Figure 3.1. Production and trade effects of selected products

Contribution to overall % change

Box 3.3. Benefits from locking in the removal of export subsidies (cont.)

The effects of export subsidy removal to help address future challenges for agricultural markets are best assessed by looking at the effects of returning to past levels of export subsidies. Assuming the European Union, United States and Canada were to increase export subsidies to 2004 levels, we would see a number of effects on world markets. As expected, world prices for some commodities would fall, production would become more concentrated in subsidising countries, exports from other regions would fall as would production of a number of commodities.

Artificially lower prices limit the development of agricultural production in a number of regions. While in the short term consumers may benefit from lower prices, in the long term the costs of missed opportunities for production in areas of relatively greater productivity imposes costs on these consumers. Importantly, it limits the potential for agricultural income growth, often in the poorest regions of the world. Producing more in regions where costs are greater also means that globally the food system is higher cost than it otherwise would be.

While the effects on individual markets and economies differ, both in the short and long run, the use of export subsidies is also likely to decrease the flexibility of global production systems in meeting the challenges brought by climate change and rising demand. With the use of subsidies, production becomes more centred in specific areas in the world and becomes less responsive to changes in price.

These two effects can make global supplies more susceptible to regional production shocks, be they climate based or market based. Further, the incentives created lock-in both quantities and types of production. They also often work against promoting productivity growth and innovation as producers no longer need to adapt to remain competitive on world markets.

Past studies of multilateral agricultural trade reform post-Doha

There are numerous studies that have analysed the potential gains from agricultural liberalisation since the Doha round began. These studies have generally used CGE models that have 1997, 2001 or 2004 as the base year on which the impacts are assessed. Studies vary in the use of specific models, the scope of the reforms examined and the underlying assumptions made with respect to market dynamics and import and export elasticities. Details on past results are briefly summarised below.

Bouët et al. (2005) explored the effects on trade, prices and welfare of multilateral agricultural trade reform based around possible reforms set out in the unimplemented 2004 round of negotiations. The authors included a number of new modelling assumptions, combined with an updated database that better reflected market access, domestic support and export restrictions that existed in 2004 – in particular the inclusion of applied bilateral tariffs, domestic support (OECD PSE) and changes to labour market assumptions. The former two developments have now been mainstreamed into the GTAP database (and so also included in METRO). Bouët et al. (2005) found that the gains from the implementation of the then proposed set of agricultural trade reforms were much lower than that found by other studies. In particular, for some developing countries the welfare effects of reform were either small or negative and trade levels increased much less than seen in other models. The results were driven by the low actual tariff cuts that formed part of the then potential agreement and preference erosion for some developing countries.

Tokarick (2008) provides a short summary of several CGE studies examining the welfare effects (measured as changes in real income) of agricultural trade liberalisation. This review, coupled with the author's own analysis highlighted:

- Tariff reform provides the greatest contribution to real income growth from agricultural trade liberalisation. This stems from relatively low use of subsidies (base years vary from 2001 to 1997), the economic effects of tariffs (subsidy plus consumption tax versus only subsidy) and the more extensive use of tariff protection for agricultural products.

- Benefits to flow to developing countries depend on both their agricultural trade status (net exporter or net importer) and, critically, on their own liberalisation efforts. Indeed Francois, van Meijl and van Tongeren (2005) find that own liberalisation is critical to the potential gains that may accrue to developing countries.

- While the benefits of own liberalisation vary for developing countries (from less than those conveyed from developed country reforms to significantly greater), in general, much of any

negative effect from developed country liberalisation can be offset by reforms to their own protection regimes.

- The critical importance in the estimated impacts of agricultural liberalisation are estimates made with respect to the degree of substitutability between domestic and international goods. The more homogenous, the greater the benefits (or lower the costs) imposed on developing countries from liberalisation.

- Across most studies, preference erosion for developing countries was not found to be a significant issue.

Anderson, Cockburn and Martin (2011) also provide a summary of results from agricultural trade reform based on results from the LINKAGE model. They also show that based on 2004 policy and trading patterns, developed countries were likely to gain more from trade reform than others, but that farm incomes in developing countries would rise, causing the farm non-farm wage gap to fall. A summary of the results from studies that linked the CGE modelling results to household level data highlighted that agricultural (and merchandise more general) trade reform had significant potential to reduce poverty and inequality in developing countries.

The OECD has also conducted its own modelling related to agricultural trade and domestic market reforms. A comprehensive report into international, national and household level effects was completed in 2006 (OECD, 2006). This study, using AGLINK and GTAPEM, found the economy-wide welfare gains were likely to be positive for the majority of individual countries and regions analysed. The magnitude of multi-sector reform benefits, when expressed as a percentage increment in GDP, is higher for the non-OECD region than the reform induced gain in welfare estimated for the OECD region. The household levels effects were found to be greatest for those households which supplied labour to commercial agricultural production. For other households, either diversified income sources or for subsistence households, limited market interaction, muted the impacts of agricultural trade reform.

Some studies have also explored the potential advantages of achieving agreement, even if the level of reform was modest. Bouët and Larborde (2009) suggest that without an agreement, a shift towards protectionism by countries increasing tariffs to bound rates would be costly in both trade and welfare terms. These costs could be significantly mitigated through the signing of even a modest agreement.

3.3   The impacts of current agricultural policies

In this section the impacts of agricultural trade and domestic support policies on agro-food markets, domestic economies and the global economy are explored. For some agricultural products, production is directly consumed and so is analogous to outputs from the food sector. Similarly, some products from the food sector are inputs into other production activities and so are also not final. While no perfect delineation between the categories is possible, for this study, agriculture is broadly defined as primary production activities with food as processing activities. Details are provided in Table A.2 (agriculture represents sectors 1-10 and food 11-19).

On production

A number of current trade barriers and domestic support policies are used with the intention of promoting agricultural production. Many, however, actually depress production. Agricultural production is estimated to be higher in a number of regions in the absence of current policy interventions, including in some countries that have relatively high levels of support, such as Europe and Indonesia (Figure 3.2, and more detailed information on production changes by sector and region is provided in Annex 3.A2). The reasons for this and the specific effects on production activities vary. They relate to both uneven levels of support and changes in world market prices that would occur if all countries moved away from their current set of production distorting policies.

For agricultural producers with low levels of protection such as Australia, New Zealand, Brazil and South Africa, policies used in other countries significantly impact on their production. For example,

production would be around 10% higher in Australia if domestic support and trade distortions in other countries were removed.

However, for some countries, trade and domestic support policies do promote domestic production. In China, Japan, India, Mexico, the Russian Federation and the Middle East and North Africa (MENA) region, overall production levels fall when these policies are removed. For some, this is mainly due to the removal of policies that lead to higher domestic prices for targeted products and encourage domestic production (such as in Japan and Malaysia in the case of rice, Canada in the case of raw milk and the European Union in terms of sugar beet). For others it is both the removal of domestic support policies and changes in world prices that induce production falls (such as China and India). In countries in the MENA region, much of the production changes occur due to the effects on world prices.

Figure 3.2. Impacts of removal of current policies on agricultural and food production

% changes
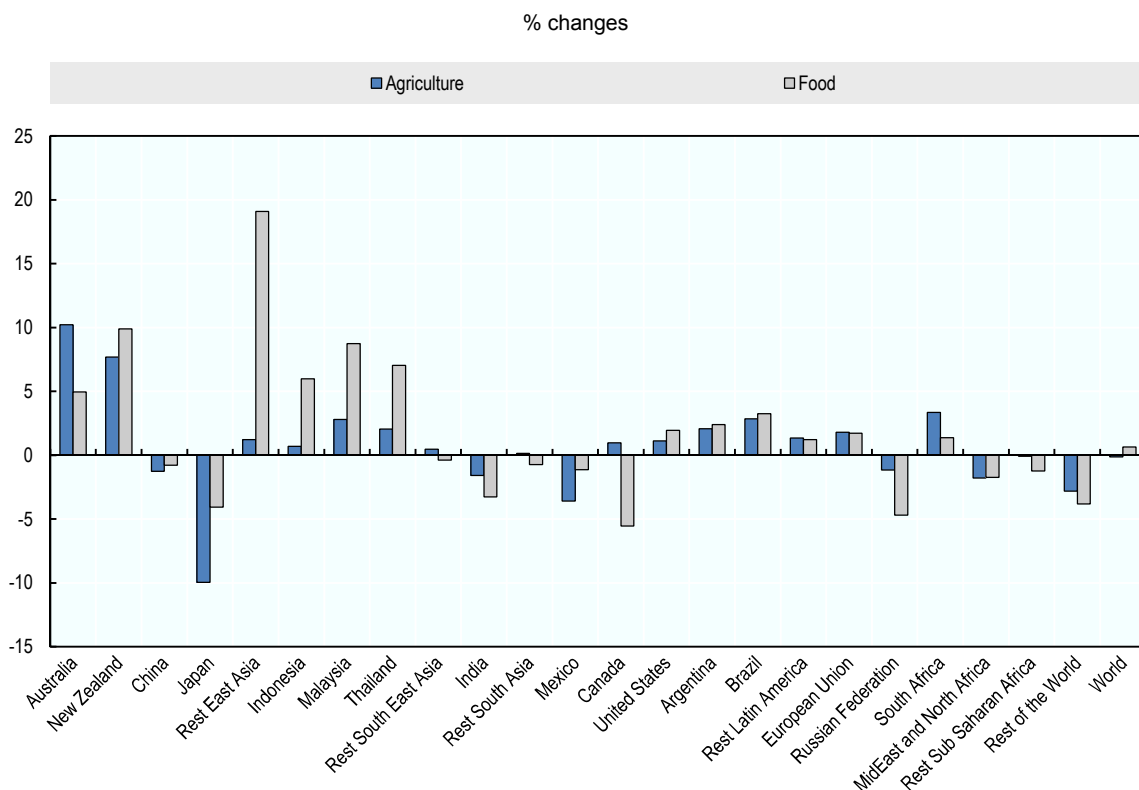
Overall, the total impacts of current policies on global production are estimated to be small. World production in agricultural products is marginally lower without current policies, but only by around 0.1%. This suggests that the main impact of current policies on world production is on the distribution of activities between countries and regions (as the country effects are relatively larger).

Changes in food production[3] generally mirror changes in agricultural production. Again, these changes are driven by a range of factors including tariffs imposed on food products, but also as a result of changes in the production of domestically produced agricultural products which are a major input into the food sectors. There are some exceptions. Food production in Canada falls by around 5% even though its agricultural production increases. This is mainly driven by a re-orientation of its agricultural sector. Current policies promote dairy which, if they were removed, would lead to a decrease in milk production (by around 36.7%). However, the removal of dairy policies, and changes in other countries' policies, encourage an expansion in wheat (46.1%) and fruit and vegetable production (11.7%). These products are mainly exported.

Interestingly, in terms of production expansion, overall food production without current agro-food trade and domestic support policies would be around 0.7% higher. The increase in food production given the marginal fall in world agricultural production is less contradictory than it seems. While being a main input, agricultural products only constitute a part of all inputs into food production (around 35%). Another 25% comes from production from the food industry itself, while the remaining inputs are provided by manufacturing and services, 15% and 25% respectively. In practical terms, this increased production may be in the form of a more productive food sector as it is able to use agricultural inputs more efficiently in reaction to changing prices and supplies.

The effects of policies differ across the different agricultural and food products examined (Figure 3.3). Global production decreases for rice, wheat, oil seeds, plant based fibres, other crops and wool, but production of other products increases. The biggest result, however, is observed in rice. Overall, world production of rice decreases by 2.1%, with a significant shift in production away from Japan to predominately Thailand and the United States (Annex 3.A2). Despite this, trade in rice increases (as discussed below). Wheat is another commodity where current policies lead to greater levels of production than might otherwise occur. Wheat production decreases mainly in MENA, India, United States and China and increases mainly in Canada, the Russian Federation, the Rest of the World region and the European Union. In aggregate, this creates a net decrease of around 0.8%. For animal production, the effects are both an increase in production and a re-allocation of activity. Increases are seen across countries in Oceania and most of the Americas (except Mexico and Canada).

Figure 3.3. Impacts of removal of current policies on world production, sectors

% changes
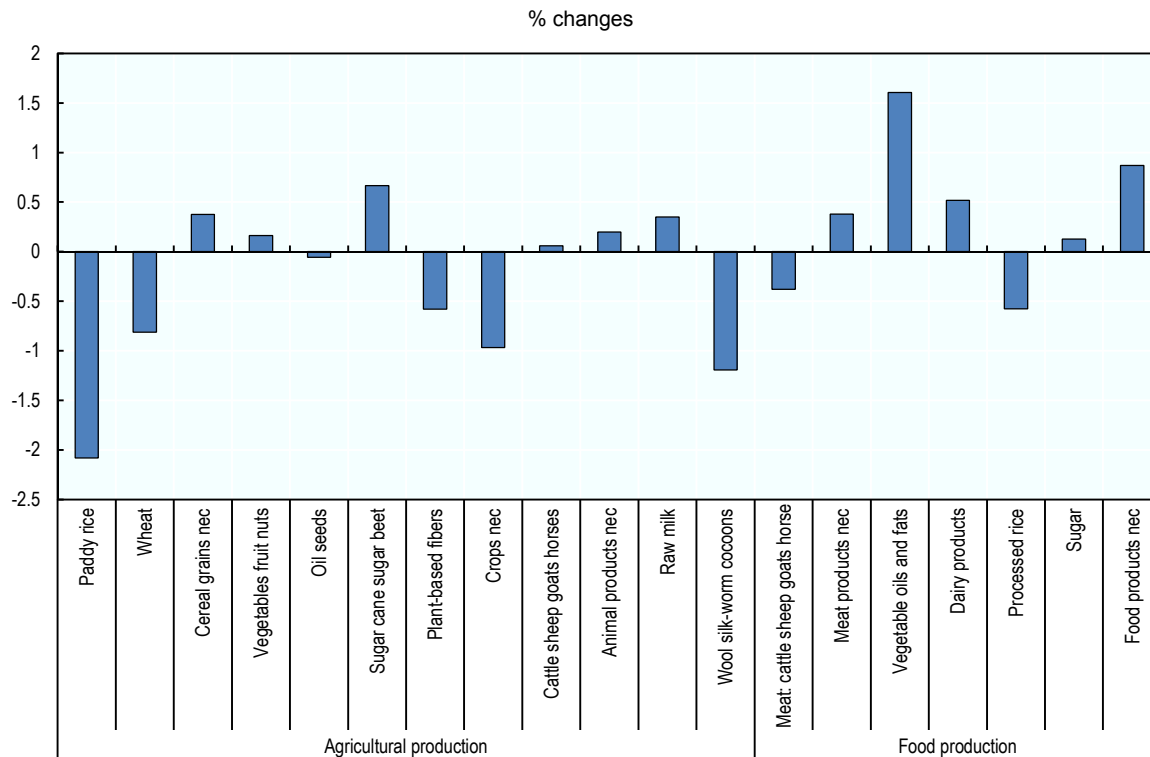
Source: Author estimates from METRO.

While only appearing as a moderate net effect, oil seed production experiences a considerable regional production shift (Annex 3.A2). Overall, world production falls marginally by 0.1%, but there is a significant decrease in production in China, Argentina and India, which is offset by higher production levels in Malaysia, Indonesia, Brazil, Rest of Latin America, the European Union and the United States. Similarly for wool, the removal of current policies creates a significant reallocation of activity. Decreasing production in China of around 41.3% is alleviated by strongly increasing production in Australia, 98.1% (net impact is a fall of 1.2%).

In regards to food sectors, global production of dairy products and vegetable oils and fats increase while the impacts of meat products are mixed (Figure 3.2). Again, for many of these sectors there is significant re-allocation of production activity across the globe (Annex 3.A2).

On trade

Current agricultural policies hinder overall agro-food trade. In the absence of the current suite of policies agricultural trade would be 5.3% higher and trade in food products would be 9.7% higher. Increasing food trade occurs for all regions, while the story for individual agricultural products is mixed (Figure 3.4).

Figure 3.4. Impacts of removal of current policies on trade in agro-food products by region
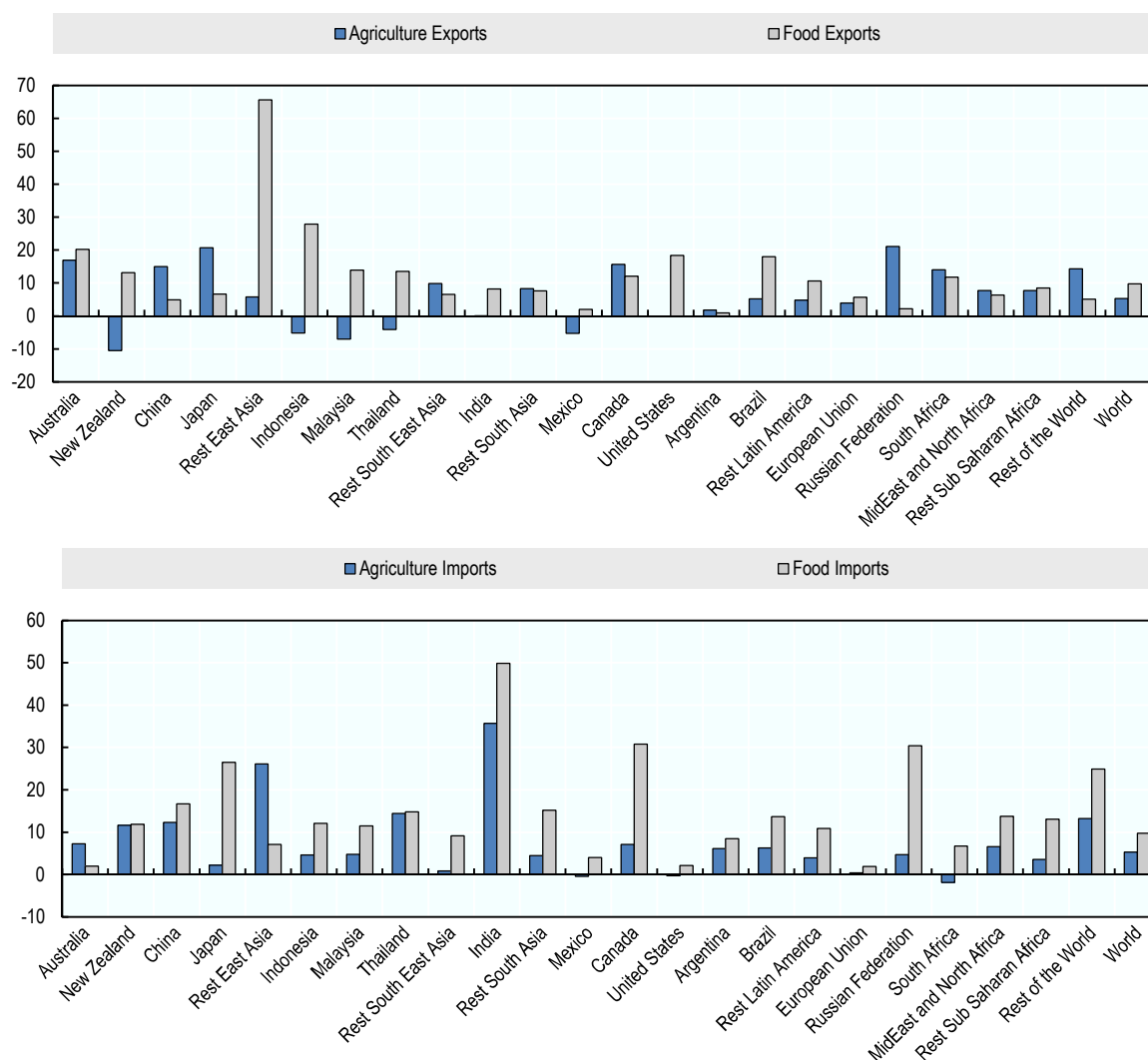
The effects vary across countries with many changes unrelated to changes in production. In Japan, for example, agricultural exports increase by around 21%, while agricultural production decreases by around 10% (on the back of falling rice production). These changes are brought about by shifts in the relative importance of different agricultural sectors in total production, along with changing prices for agricultural and food products. In New Zealand, the effects on trade are also distinct from production, but for different reasons. Increased agricultural production is consumed domestically by the even stronger increased food production. This is because agricultural exports constitute only a relative small share of New Zealand's total agro-food exports. Exports are dominated by the food sectors of meat and dairy which account for around 73% of total agro-food exports. Exports of these products increase by around 38.5% and 12.2% respectively.

Taking a closer look at Japan's trade and production changes reveals that the effects of current policies are complex. Removal of domestic support means that the cost of production increases. On the demand side, higher cost domestic produce must compete with relatively lower priced imports, leading to falls in demand and production. For food products, changes to policies cause domestic prices to fall. For the food industry, higher cost inputs from agriculture and lower output prices (as a result of more international competition) lead to decreasing food production, both for intermediate use and final consumption (Table 3.1). Demand for agricultural and food intermediates decreases accordingly (depicted by decreasing intermediates supply; Table 3.1, right columns). As a result of these effects, agricultural production further decreases, but there is also a reallocation to final consumption goods, which increase by 4.7%. However, the fall in the price of food products domestically increases the competitiveness of some of Japan's food exports globally. Given the relatively small export shares in overseas markets, the price effect creates a relatively larger increase in total exports (in percentage terms).

Increasing trade in most products (Figure 3.5) also suggests that trading patterns across the world are altered by current policy settings. Rice and wool are especially affected (both are traded predominately as intermediate products). For these products, current policies cause a large disruption to the location of production across regions and therefore trade. In other products, current policies also alter the location of processing. For example, trade of sugar beets and cane decreases while its global production increases. This occurs as more regions produce their own sugar rather than trade in the intermediate product in the absence of high barriers on the final consumption good (sugar). Production and trade in plant-based fibres also decreases, as a result of decreasing demand for this product once current policies are removed.

While exports in agricultural and food products show differing patterns in a number of countries, the story for imports is more uniform (Figure 3.6). Current agro-food policies generally limit imports of agro-food products for all countries, either directly through barriers to their importation, or indirectly by altering the costs of final products. Imports (and trade in general) in intermediate products is particularly limited by current policies. These patterns indicate that current policies are likely to be having significant negative effects on the participation in global value chains by producers in a number of countries.

Table 3.1. Linking production and trade in Japan's agro-food sectors

% Change	Production		Exports		Imports		Supply in Japan	
	Intermediate use	Final consumption	Intermediate use	Final consumption	Intermediate use	Final consumption	Intermediate use	Final consumption
Total	-9.77	-2.11	2.95	11.00	27.07	51.06	-4.88	2.72
Agriculture	-15.88	4.66	-2.21	31.37	25.41	2.81	-10.63	3.71
Food	-6.58	-2.81	5.80	6.90	28.36	58.96	-1.64	2.61

Source: Author estimates from METRO.

Figure 3.5. Impacts of removal of current policies on trade by commodity

% changes by end use categories
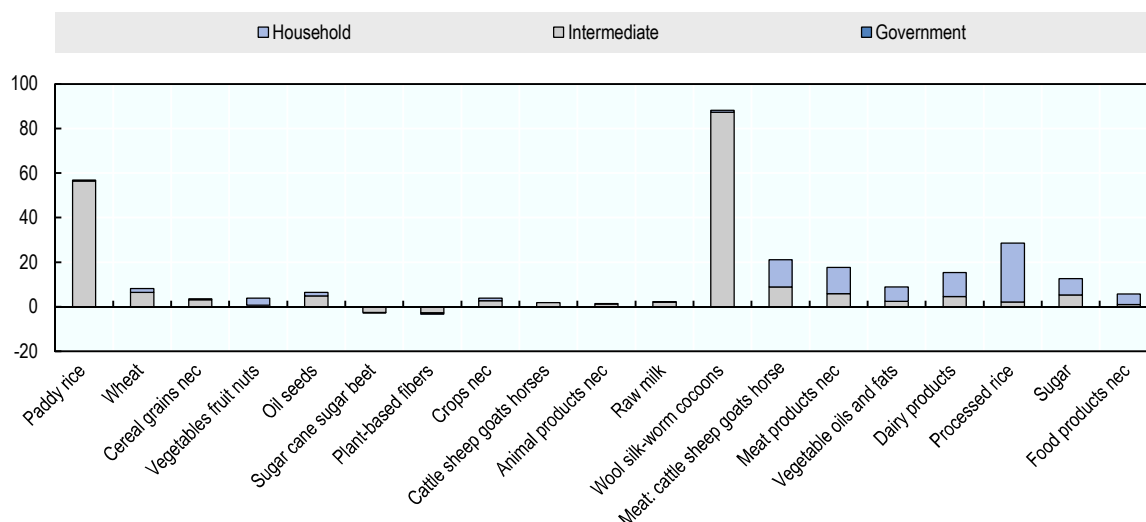
Source: Author estimates from METRO.

Figure 3.6. Impacts of removal of current policies on imports of intermediates by region

% changes
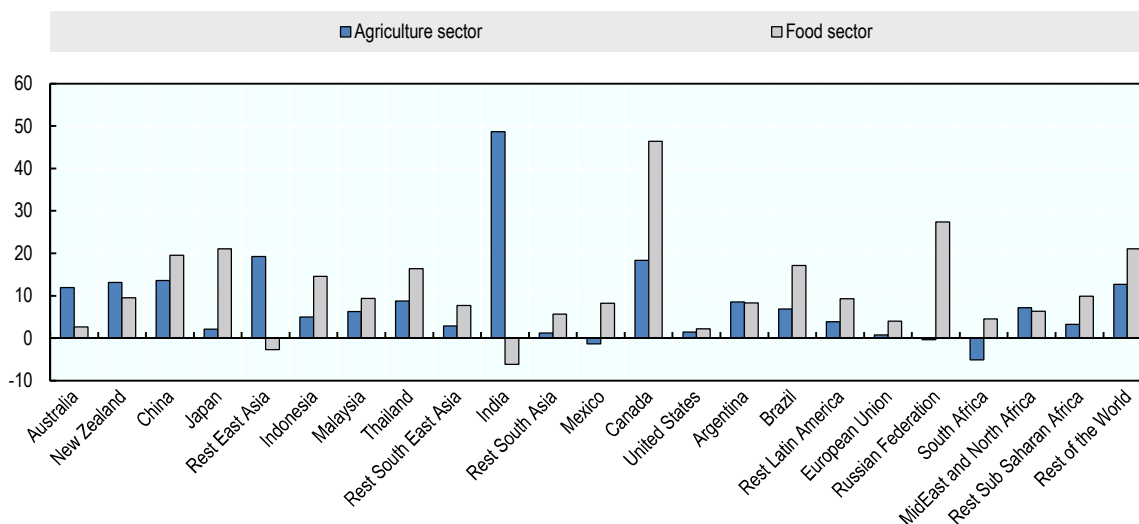
Source: Author estimates from METRO.

On consumption and total production

The effects of agro-food policies on the total economy are relatively small given that agro-food sector accounts for only a small part of total production in many countries. Despite this, it is still of value to look at the economy-wide welfare and production effects as a number of the effects of policies directed towards the agro-food sector occur outside the sector.

Total production, that is output from all sectors in the economy, is estimated to be higher in most regions if governments did not intervene in agricultural markets (Table 3.2). In some regions, production increases are driven by the agro-food sector itself, such as Australia and New Zealand. In other regions it is driven by a reallocation of resources away from agriculture to other sectors, such as in Japan. In the former group, where increases in agro-food sector production increase total production, the reallocation of

resources to agro-food sectors causes a contraction in activity in non-agro-food sectors, but weaker than the positive impact on the agro-food sector. Total production decreases in China, India, Mexico, Canada and the Russian Federation. In these countries the growth effect in non-agro-food sector output is not strong enough to mitigate decreasing agricultural and food production.

Looking beyond agro-food sectors, the result of current agro-food policies on total trade is also negative. In the absence of such policies, all regions exhibit stronger engagement in trade: total exports and imports increase in all regions. There is one exception, that of Argentina, where exports decrease slightly due to falling manufacturing exports.

Changes in production do not, however, indicate the effects on welfare. Welfare can be proxied by changes in household incomes or consumption. While acknowledging that this is only partial, it provides a broader lens by which to assess changes than that of production or GDP. Private consumption represents the income that households receive from activities related to production as measured in the model. However, private household income is also dependent on other policy assumptions made in the model. Importantly, government policies related to taxation and government consumption will influence the levels of private income and therefore household welfare. In the base setting, it has been assumed that while governments maintain the *volume* of their consumption they vary the *value* of their consumption (and taxation) as a result of policy changes (flexible income tax). That is, if government expenditures fall, say through lower support payments or in reaction to changes in prices, then so does their tax. This implies that some of the savings from reform are shared with private households (and vice versa).[4] Alternatively, it could be assumed that tax rates remain fixed and governments maintain the value of their consumption. Taking the previous example, the savings from changes in domestic support or changes in prices are spent elsewhere by the government sector. An alternative way of thinking about the differences in the assumptions is that under the flexible income tax assumptions, governments provide some compensation or redistribution of any gains from policy reform (or conversely are compensated themselves by households). In the fixed income tax settings, governments (or households) do not.

Table 3.2. Impacts of removal of current policy on total production and trade

% change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russian Federation	South Africa	MidEast and North Africa	Rest Sub Saharan Africa	Rest of the World
Total imports	2.13	9.05	0.86	3.26	2.16	2.69	1.89	1.38	0.65	1.85	1.12	0.12	3.68	0.61	3.30	4.52	1.25	0.30	1.87	0.95	0.86	1.09	1.90
Total exports	1.03	2.54	0.81	2.13	1.60	1.80	1.01	0.67	0.48	1.22	2.35	0.28	1.83	0.16	-0.31	2.00	1.08	0.20	1.56	0.51	0.88	1.46	1.38
Total production	0.27	1.26	-0.07	0.15	1.15	0.11	0.62	0.31	0.05	-0.48	0.16	-0.07	-0.05	0.03	0.25	0.14	0.11	0.06	-0.17	0.11	0.00	0.01	0.03
Agriculture	10.21	7.69	-1.26	-9.97	1.23	0.68	2.81	2.04	0.48	-1.59	0.14	-3.59	0.97	1.12	2.08	2.85	1.35	1.80	-1.16	3.34	-1.80	-0.08	-2.82
Food	4.95	9.88	-0.79	-4.07	19.09	5.97	8.73	7.04	-0.39	-3.27	-0.72	-1.13	-5.54	1.94	2.39	3.24	1.23	1.72	-4.69	1.36	-1.74	-1.24	-3.81
Extraction	-1.15	-5.54	0.15	0.85	0.44	-0.81	-0.24	-0.35	-0.03	0.51	0.23	0.04	0.16	-0.25	-1.26	-1.74	-0.19	-0.13	0.56	-0.23	0.33	0.45	0.32
Manufacturing	-1.33	-5.46	0.17	1.18	1.05	-1.58	-0.64	-1.11	-0.13	0.05	0.81	0.37	0.60	-0.33	-1.47	-1.10	-0.25	-0.23	0.55	-0.33	0.53	0.73	1.21
Services	0.22	1.20	-0.02	0.07	0.13	0.13	0.17	0.23	0.12	-0.09	-0.02	0.04	0.02	0.06	0.37	0.18	-0.04	0.03	-0.14	0.11	-0.13	-0.07	0.02

Source: Author estimates from METRO.

The impacts on consumption under both flexible and fixed income tax closures are shown in Table 3.3.[5] In Table 3.3, another variable is shown which is termed 'absorption'. Absorption measures total demand (private, government and investment) for final goods in an economy. Absorption increases in all but five regions when agro-food policies are removed – those of China, Rest of South Asia, Mexico, MENA and Sub-Saharan Africa. Differences between the two closure assumptions show that under both, total demand remains relatively similar, but there are sometimes conflicting effects on households (and so household welfare). The difference is driven critically by how the effects of changes in current agro-food policies are shared, especially given the significant use of tariffs and subsidies that directly influence government income.

Decreasing tariff revenues in South Asia, MENA and Sub-Saharan Africa are the main determinants behind falling absorption in these regions (as can be seen in the fixed tax rate closure results in Table 3.3). And while households benefit from higher consumption due to lower prices and higher returns from endowments provided to other sectors of the economy, these benefits do not outweigh the falls in tariff revenues. In aggregate, however, the net effects are relatively small.

The changes in private consumption between the two closures indicate that for some countries, any gains from reform for households are reliant on some redistribution of the benefits (Table 3.3). For some countries, without redistribution, households would face falls in incomes (and thus consumption). This is the case in India and the United States. In these countries, domestic support is significant, and in the case of the United States, tariffs across a range of agricultural products are relatively low. In reverse, in a number of countries the government sector is made worse off from reforms due to lower revenues despite the economy as a whole benefiting.

The impacts of current policies also vary in their effects on labour income (Figure 3.7). In most countries, the effects on all types of labour income of agricultural policies are negative. This is due to the fact that current policies generally discourage labour employment by other sectors of the economy. However, it is not so in all countries. In China, India, Mexico and the United States, agricultural and other low skilled workers see wage falls if agricultural policies were removed. However, it should be noted that the agro-food sector also employs workers from across all employment categories, suggesting relative wages within the industry also change.

Table 3.3. Impacts of removal of current policy on consumption

% change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russian Federation	South Africa	Middle East and North Africa	Rest Sub Saharan Africa	Rest of the World
Flexible income tax - flexible government income																							
Absorption	0.22	1.91	-0.01	0.05	0.26	0.19	0.61	0.57	0.11	0.23	-0.07	-0.04	0.23	0.08	0.62	0.32	0.05	0.04	0.04	0.16	-0.09	-0.14	0.07
Government consumption	0.02	0.97	-0.05	-0.09	-0.96	0.06	-0.04	0.17	0.00	0.12	-0.25	0.09	0.00	0.05	0.30	0.19	-0.11	-0.02	-0.11	-0.01	-0.33	-0.45	-0.17
Private consumption	0.39	2.83	-0.01	0.12	0.69	0.33	1.08	0.94	0.17	0.37	-0.07	-0.08	0.42	0.11	0.87	0.46	0.10	0.08	0.12	0.27	-0.05	-0.13	0.16
Fix tax rates - predefined government income																							
Absorption	0.21	1.91	-0.04	0.05	0.25	0.20	0.57	0.55	0.10	0.22	-0.09	-0.05	0.23	0.09	0.61	0.31	0.05	0.04	0.04	0.16	-0.08	-0.14	0.07
Government consumption	0.43	1.92	3.54	0.02	-7.01	-0.91	-2.76	-3.09	-2.55	5.02	-4.79	1.92	0.04	0.71	0.81	0.54	-1.55	-0.14	-0.02	-0.24	-1.92	-4.17	0.08
Private consumption	0.25	2.51	-1.41	0.08	2.12	0.49	1.76	1.68	0.56	-0.59	0.47	-0.41	0.40	-0.04	0.75	0.33	0.41	0.13	0.08	0.35	0.44	0.58	0.09

Source: Author estimates from METRO.

Figure 3.7. Impacts of removal of current policy on endowment income

% changes
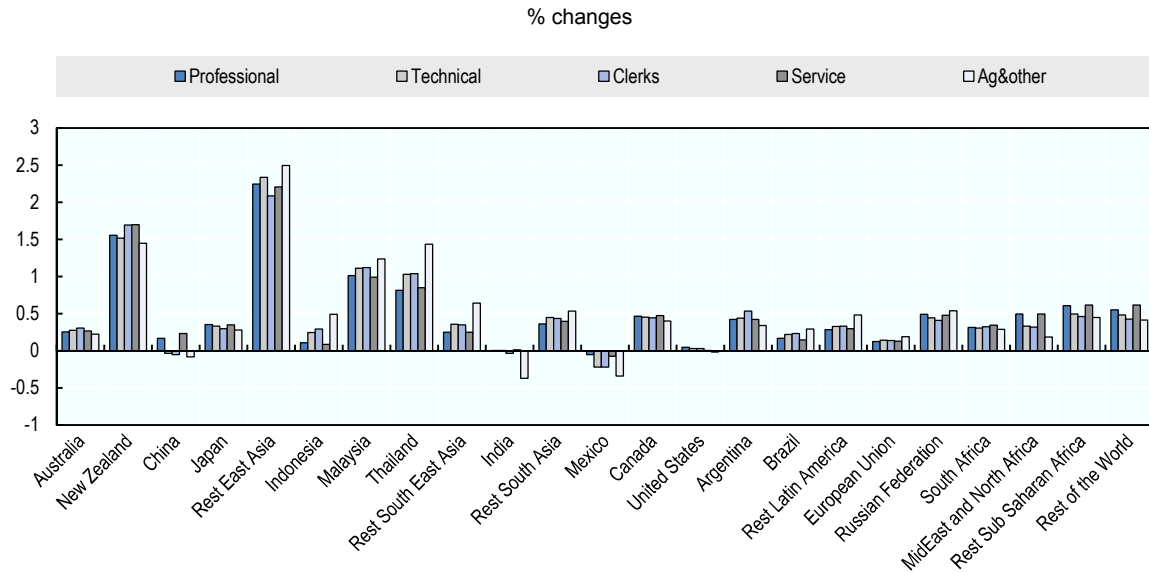
Notes: Labour categories represent aggregated 2008 International Labour Organisation (ILO) Categories. Professionals includes ILO categories of Managers and Professionals (major groups 1 and 2); Technical includes ILO category Technical and Associate Professionals (major group 3); Clerks represents ILO category Clerical Support Workers (major group 4); Service represents ILO category Services and Sales Workers (major group 5); and Ag&other represents ILO categories Skilled Agricultural, Forestry and Fisheries Workers, Craft and Related Trades Workers, Plant and Machine Operators and Assemblers, and Elementary Occupations (major groups 6-9). See www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf for more details.

Source: Author estimates from METRO.

Labour is not the only endowment factor affected by agricultural policies. Rents for land also change in most countries through the combination of the removal of land subsidies and changes in the returns to the agricultural sector (Figure 3.7). In the case of the United States, the major effects on household income result from changes in land rents rather than other effects. This is primarily due to the nature of the support offered to agricultural producers. For the four countries affected by wage decreases for agricultural and other low skilled workers, and the United States with respect to land, governments benefit from the policy change (indicated by increasing government consumption in Table 3.3). However, the differences in the closure assumptions in Table 3.3 show that the governments could alleviate the negative effects for households by transferring parts of the income increase to households (the net result for China is approximately neutral, that is, absorption effects are approximately zero).

3.4   A closer look at the effects on markets

It is worth exploring in more detail how the current suite of policy measures may affect the outlook for agricultural markets. In particular, what are the expected outcomes in terms of prices and trade flows over the medium term if such policies were not in place? The OECD-FAO AGLINK-COSIMO model provides a platform for assessing the likely effects on world agricultural markets. Estimates of these effects can be calculated using the current set of projections from the *Agricultural Outlook 2015* (OECD-FAO, 2015).

Prices

The measured trade and domestic support policies influence world prices, but on balance, that influence is relatively small. Further, interactions between different policy measures suggest that the price effects of policy interventions across all products are not all in the same directions (Figure 3.8).

Figure 3.8. Impacts of policy removal on trade flows and world prices

Selected commodities, difference to 2024 baseline
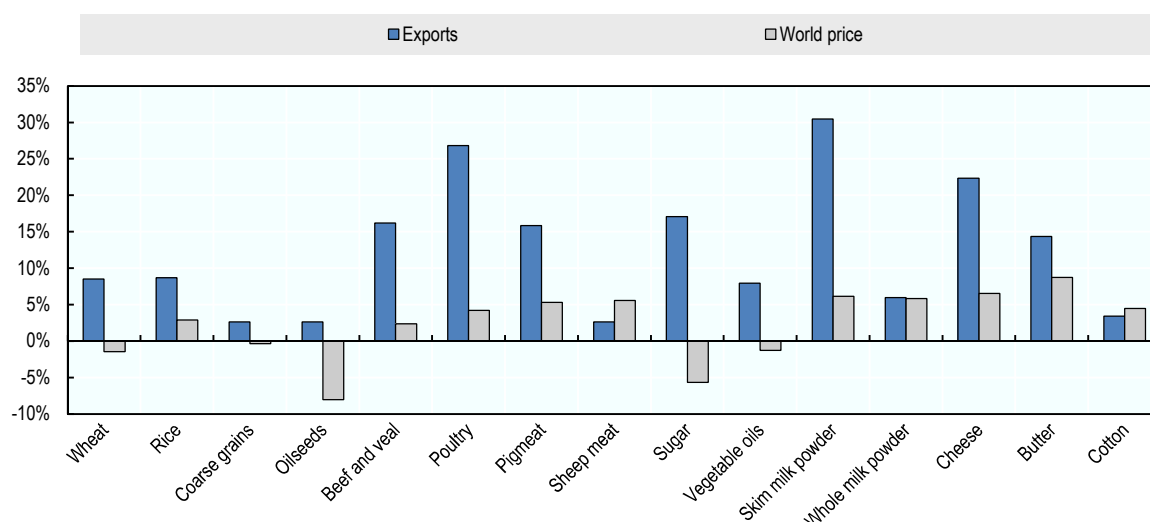
Notes: Sugar price refers to the United States domestic sugar price.

Source: Author estimates from AGLINK-COSIMO.

In general, agro-food trade and domestic support policies depress world prices. Prices for most agricultural products are expected to be higher in the absence of such measures. However, there are some exceptions. The results from the AGLINK-COSIMO simulations suggest that, in particular, the export taxes on oilseeds (soybeans) from Argentina inflate world prices. The removal of these export taxes subsequently leads to price falls. This has a flow-on effect on the price of vegetable oils where, due to the effects of other policy interventions, prices would also be expected to be lower in the absence of policy interventions.

In grains markets, the price effects of policies are relatively small. For rice, the limited price effect is likely a result of the range of measures simulated. For example, in Indonesia and a number of other rice-importing countries in Asia (such as the Philippines and Malaysia), trade distortions are mainly a result of import licensing arrangements, rather than the MFN tariffs. Because import licensing arrangements are not captured in the MFN tariff, they are not modelled in AGLINK-COSIMO (although they are included to some extent in METRO through *ad valorem* equivalents within the GTAP database). In wheat markets the effects are more complex. Overall, policies inflate world market prices through tariffs on animal products and biofuels which influence demand for wheat for feed in the Russian Federation and biofuels in the European Union.

For sugar, the price shown on Figure 3.9 is the United States domestic price. The impact of current policies inflates the United States domestic price (no world price for sugar exist in the model). For major sugar exporters, however, the price effects in domestic markets are limited with little change in prices created by current policies. The exception to this is Argentina, where in the absence of current policies domestic prices are estimated to rise. In other domestic markets across the world, domestic sugar prices are in general expected to fall in the absence of current policies (Figure 3.9).

World meat and dairy market prices are lower as a result of current policy interventions. These markets are primarily affected by the traditional tariff and quota type trade restrictions that dampen trade flows and as such world prices.

Figure 3.9. Impacts of policy removal on sugar prices

Difference to 2024 baseline, %
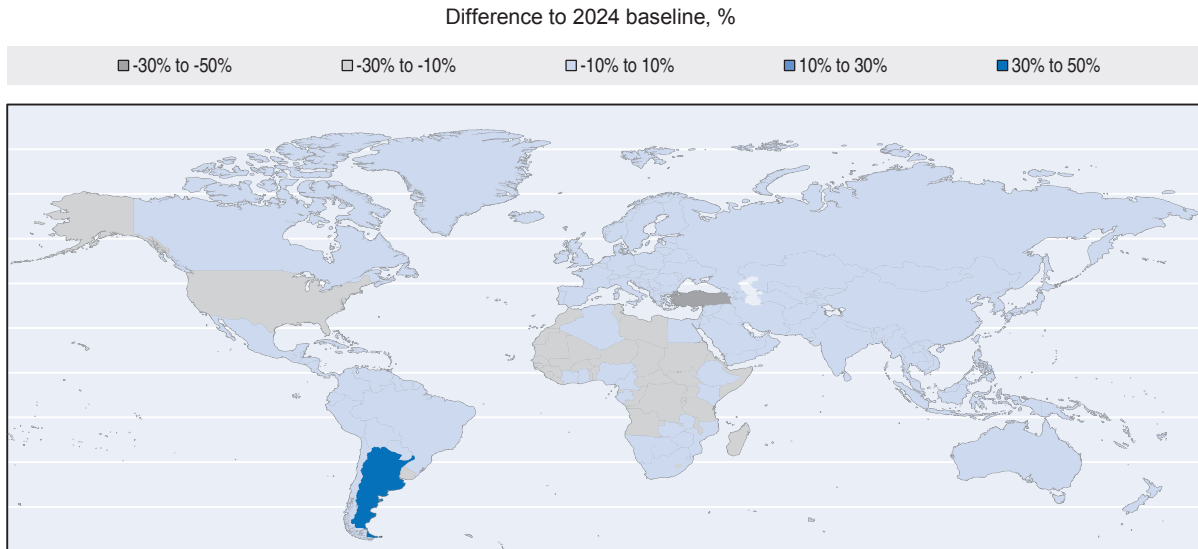
Source: Author estimates from AGLINK-COSIMO.

Trade flows

Current policy settings have the largest impact on trade flows in meat and dairy markets – this is in line with the observed price effects of current policies (which are greatest in meat and dairy markets, see Figure 3.8). Trade flows for a number of these products are considerably lower than what may otherwise occur. Given that demand for these products is projected to rise in the future, the efficiency cost of current policies, if maintained, is also expected to increase.

What is noticeable from expected effects on trade flows is that for all products examined, the impact of current policies is to restrict trade (as seen in the METRO model results). As a result, shares of production traded are lower than would otherwise be the case, making international markets in some products relatively thin. It is possible that the removal of such policies could both enhance trade flows and potentially increase confidence in international markets as with higher trading, the price effects in one region would be expected to be hedged to a greater extent by supplies from other regions.

The distribution of impacts on trade flows varies across products. Expected changes in trade volumes for oilseeds, beef and veal, and poultry are shown in Figures 3.10, 3.11 and 3.12.

For all the three products highlighted, much of the impact of current policy settings is felt by exporting regions in South America, in particular, Brazil and Argentina. For both oilseeds and poultry, changes in exports show an increase in total traded volumes as well as a shift in the relative importance of countries. For oilseeds, Argentina's export tax arrangements have led to greater trade flows from Brazil and the United States. For poultry, the trade effects of current policies are a combination of effects that relate to both direct trade policies along with indirect effects from changes brought about in relative feed costs. The impact of the removal of these policies on poultry trade is shown on Figure 3.11.

Figure 3.10. Impacts of policy removal on oilseed trade

Difference to baseline in 2024, kt

Exports   Imports
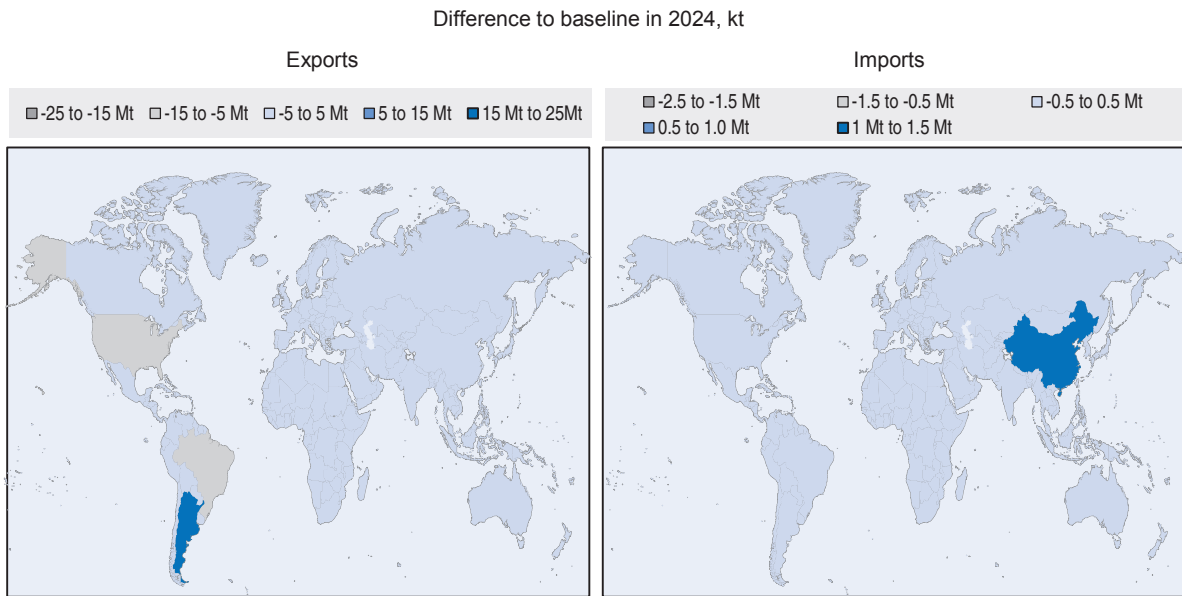
Source: Author estimates from AGLINK-COSIMO.

Figure 3.11. Impacts of policy removal on beef and veal trade

Difference to baseline in 2024, kt

Exports   Imports
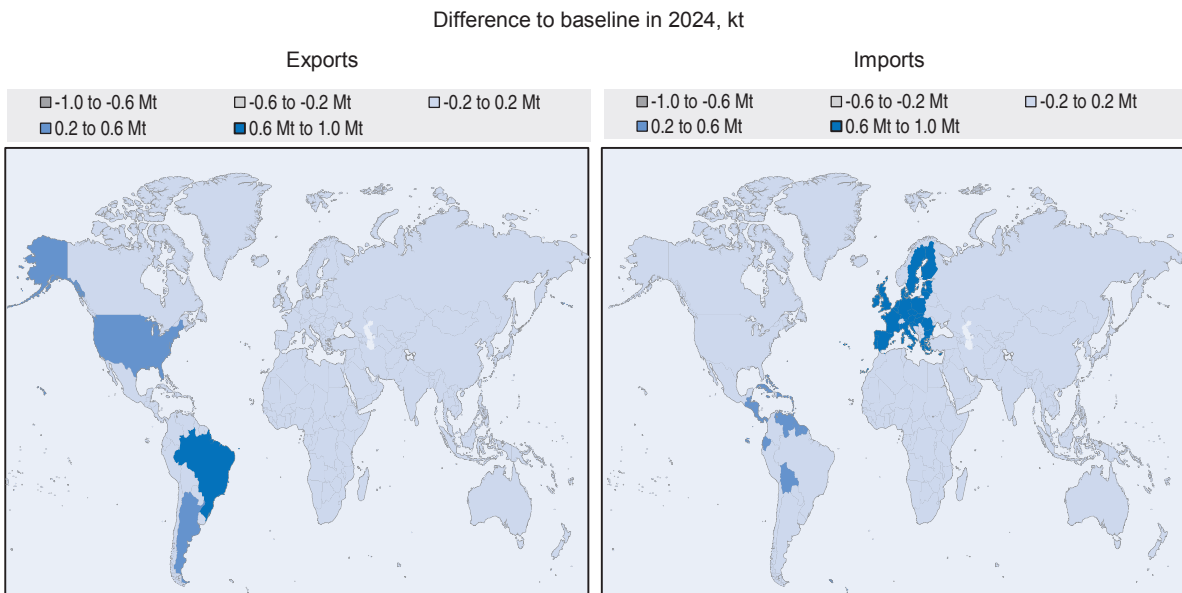
Source: Author estimates from AGLINK-COSIMO.

Figure 3.12. Impacts of policy removal on poultry trade

Difference to baseline in 2024, kt
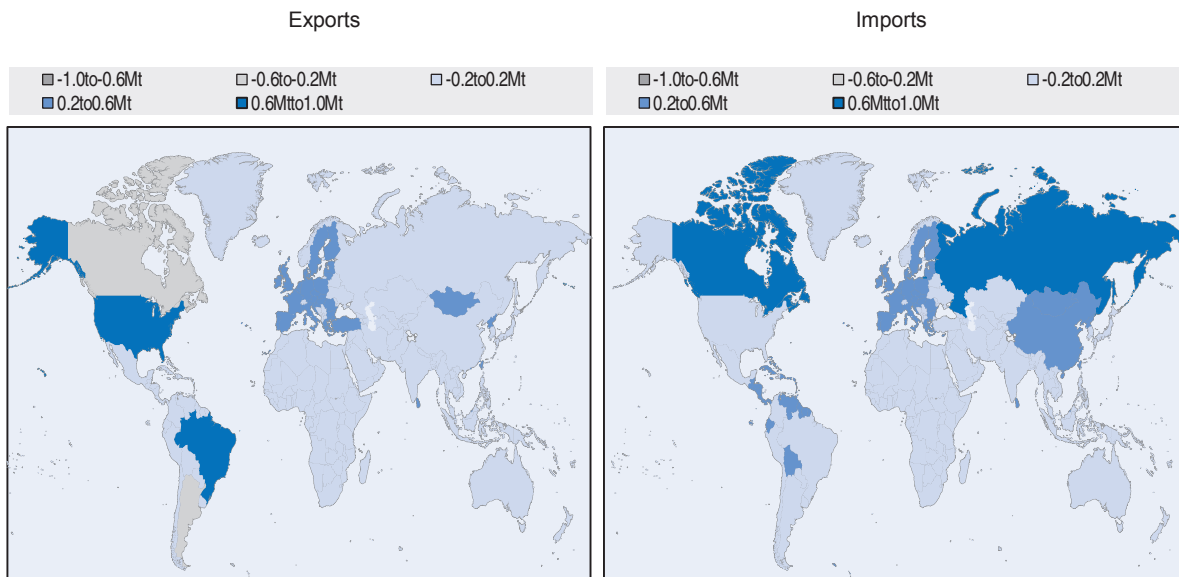
Source: Author estimates from AGLINK-COSIMO.

3.5   Impacts of possible multilateral reform scenarios

Looking beyond the impacts of the current set of policies, it is worth examining what are the possible impacts of trade reform on agriculture and food sectors. To do so, three scenarios are explored. First, a multilateral commitment to reform that sees modest changes in developed countries and only small changes in developing countries (*trade and domestic policy reform scenario,* for details see Section 3.2). Second, a situation where the multilateral agreement scenario is extended to developing countries and covers liberalisation efforts like those in developed countries (an extension of *trade and domestic policy reform scenario* termed *policy reform all* – for details see Section 3.2). Third a situation of no agreement compared with an agreement that locks in current levels of market access and domestic support. The latter so called *policy drift scenario* (for details see Section 3.2) shows the effects of stylised recent developments in agricultural markets over the period between 2011 and 2014. For all scenarios, the aggregate effects on the level of world agricultural and food production are only minor (Figure 3.13). However, it is found that increasing protection in some countries has the potential to affect all other regions negatively.

Under the *policy drift scenario* the effects vary across commodities, with crop production general increasing and livestock production falling (Figure 3.13). Across countries, both Malaysia and Indonesia experience production decreases, despite providing greater levels of support to the agricultural sector (but re-enforcing the current non-uniform targeting of individual production activities) (Figure 3.14). For these countries, the small increases in rice and crop production as a result of increased domestic support are not enough to overcome decreasing production of oil seeds and vegetable oils and fats (Annex 3.A2). That is, increased support causes a substitution away from productive to less productive agricultural sectors.

Conversely, production increases in China, India and the Russian Federation. In China, production increases are concentrated in oil seeds, wool and vegetable oils and fats. The reallocation of resources means that production of livestock, meat and milk decreases. This is also the main driver of increasing production in the Russian Federation.

Figure 3.13. Effects of trade reform on production, by sector
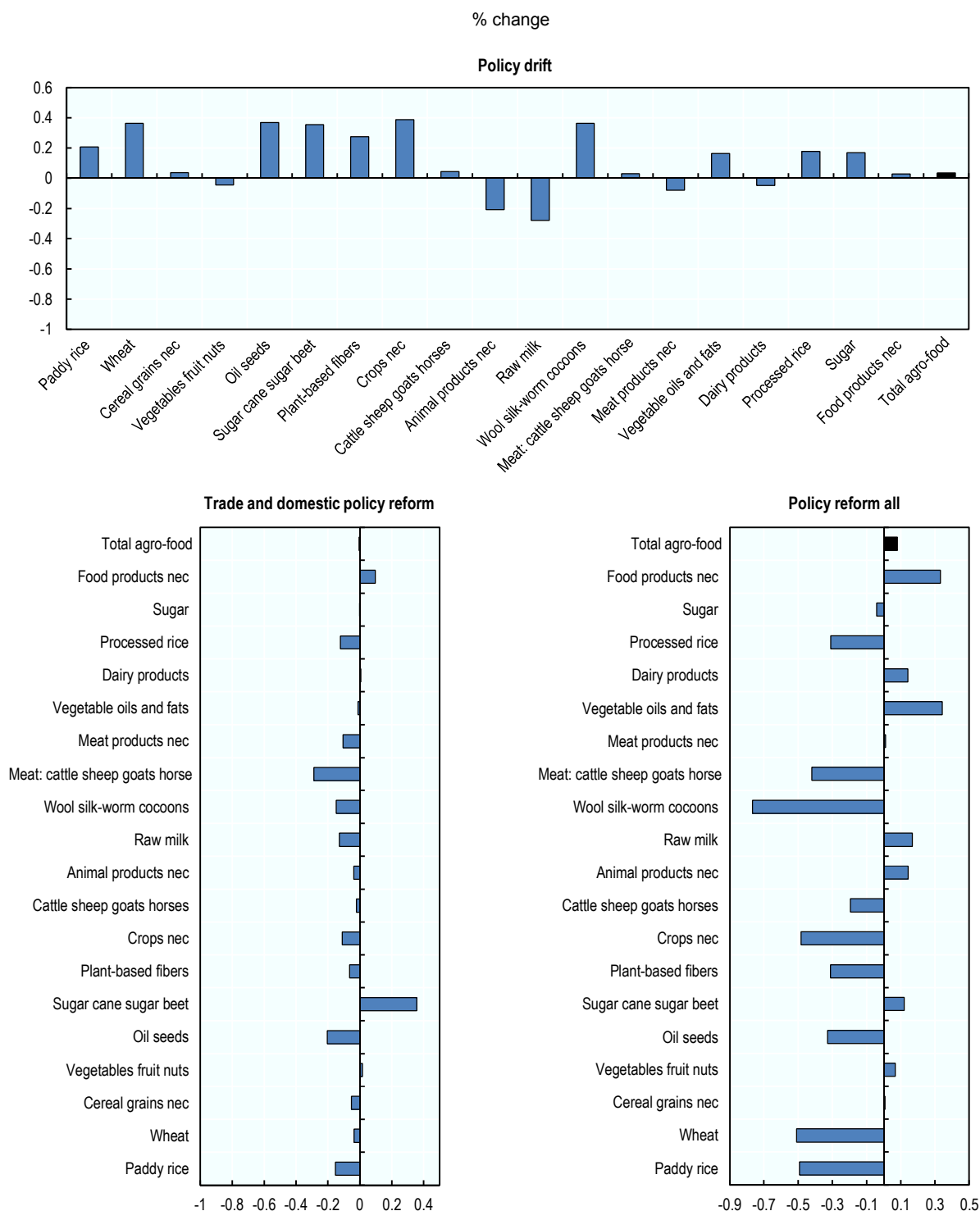
% change

Source: Author estimates from METRO.

Effects on agro-food production in all other regions are small and negative, with the changes in production in China and India dominating the worldwide effects (Annex 3.A2). The largest effects are on agricultural production in Australia, Canada and Brazil which decrease more than 0.4%. These decreases occur mostly for wool (Australia) and oil seed production (Canada and Brazil), activities which both increase considerably in China. Food production increases in Argentina (and ROW aggregate region) as a result of increasing exports of vegetable oils and fats to India (Argentina has preferential access over other major exporters).

Under the *trade and domestic policy reform scenario* the net effects on production at the sector level are small, but agro-food production declines in a number of sectors (Figure 3.13). The uneven reform and remaining support create a situation where, despite some reform, production falls (albeit by a very small amount). This points to the benefits from greater coverage and depth of reform across all countries and, indeed, world agro-food production increases slightly (0.1%) when also developing countries join the multilateral agreement (Figure 3.13). However, effects vary across products and regions (Figure 3.14).

Figure 3.14. Effects of policy scenarios on production by country
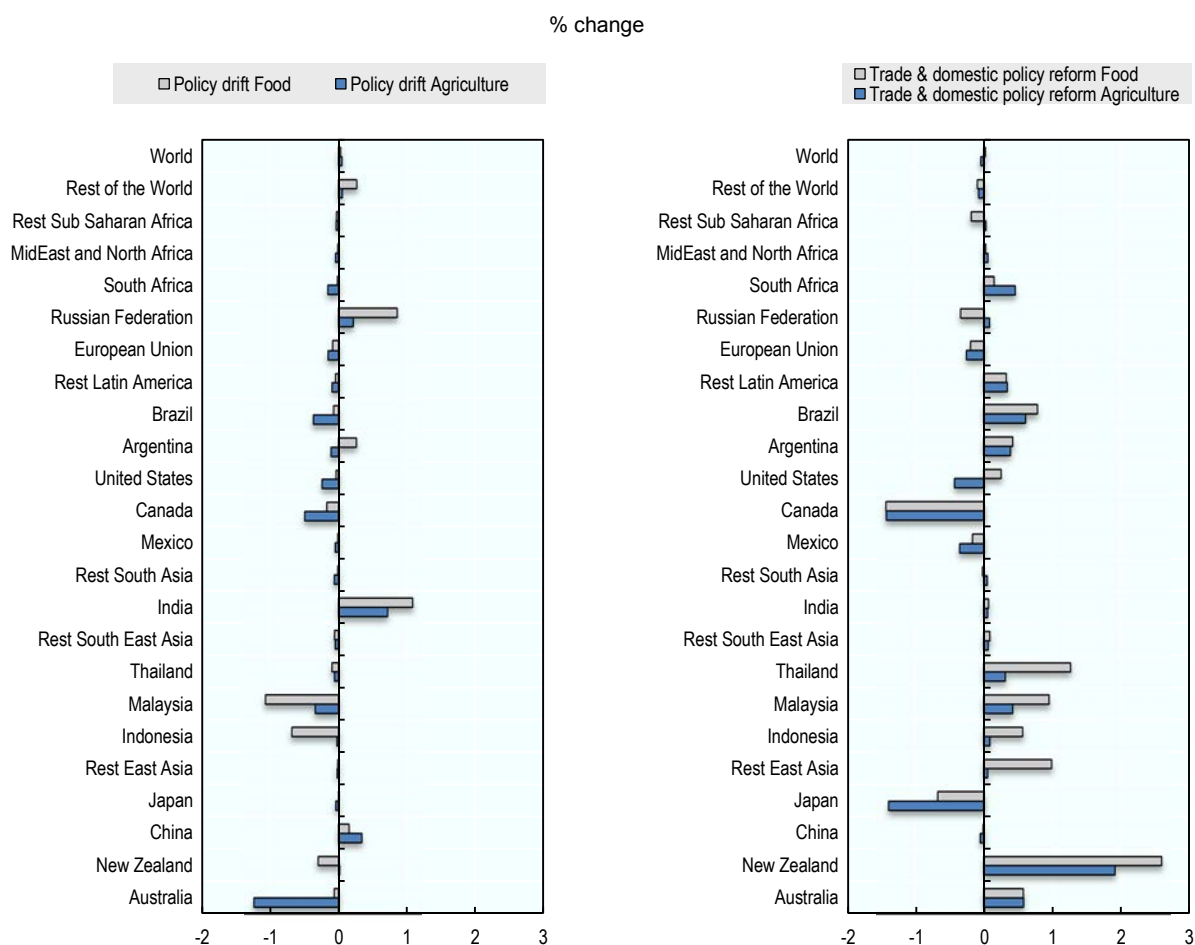
% change

Source: Author estimates from METRO.

While the effects of *trade and domestic policy reform* on aggregate production are small, there are some significant changes in the distribution of production. Agricultural and food production increases in Oceania, East and Southeast Asia except for Japan, where production decreases, and China, which, like South Asia, does not show net effects on production (Figure 3.14). Production increases slightly in South Africa and South America, while production decreases of Mexico, Canada and the United States. Production declines are also expected in the European Union as a result of falling trade barriers. For other regions in Africa there are only small effects. This results occurs as countries in the region and their major trading partners are relatively unaffected by the reforms.

In terms of products, the changes in the *trade and domestic policy reform* scenario cause some shifts in where production is centred (Annex 3.A2). Wheat production shifts from the United States (decreases by 7.8%), to Canada and the Russian Federation (increases of 8.7% and 3.8% respectively). Oil seed production decreases in China (2.0%), Argentina (1.6%) and the United States (0.8%) and increases in smaller amounts in various regions around the world. Australia and New Zealand experience the largest increase of agro-food production. Both countries increase cattle and meat production (together with Latin America and Sub-Saharan Africa). These increases in cattle and meat production compensate for other decreases that occur mainly in the European Union. The European Union sees increasing production of milk and dairy. Sugar production shifts mainly from the European Union to Brazil.

When the reform also includes developing countries (*policy reform all*), world agricultural and food production increases (by 0.1%, Figures 3.14 and 3.15). Effects on world net production by product are mixed with greater variation seen than when reforms are concentrated in developed countries. In general, there is a greater shift away from crop production to livestock based activities, with production of a number of food products also increasing. The observed effects are dominated by decreasing production levels in India, China and the MENA region (Figure 3.15). In contrast, other products experience stronger increases in production – products such as vegetables and fruits, other animal products, milk and dairy, vegetable oils and fats, and other food products. These increases are caused by increasing production levels or lower falls in a number of regions.

Effects on the production levels of developing and emerging countries are mixed under both trade and domestic policy reform scenarios (Figure 3.15). Regions that already benefit from reforms concentrated in developed countries increase agricultural and food production by a greater amount when reforms are undertaken by a wider group of countries – including countries in East and Southeast Asia (except China); Latin America (except Mexico); and for South Africa. Production increases in these regions in the same products as when developed countries undertake more significant reforms, but the effect is stronger.[6] For example oil seed (palm oil) production in Malaysia increases from 1.3% to 5.0% and in Indonesia from 1.7% to 6.6% when developing countries join a multilateral agreement; and sugar cane production in Brazil increases from 1.4% to 2.5%. Those countries with production falls include China, South Asia, Rest of Sub-Saharan Africa, Mexico and the Russian Federation. In line with areas of support, production declines are concentrated in certain sectors. These declines are, however, offset but increases in others as resources are freed up to be used in more productive activities, In China, for example, production of animal products increases while production of oil seeds and its products decrease.

For some emerging countries, the effects from developed country reforms have limited impacts whereas the effects of reforms to policies in developing countries are significant. For example, a number of countries within Southeast Asia see much larger increases in production when they and other middle to low income countries participate in multilateral reform efforts. India also experiences greater changes with production declines seen across a number of sectors.

A number of developed countries see increases in production from a greater global coverage of reform efforts. The largest production effects are seen in Australia and New Zealand, particularly for animal production and products. Net production changes from negative to positive in Canada and the United States for agriculture, and for agriculture and food production in the European Union. This increasing net production is driven by increasing wheat production in Canada; and oil seeds, other crops, vegetables and fruits, and animal production in the United States. The European Union increases

production of various products, while milk and dairy, meat (not cattle) and other food products dominate the positive net effect.

Across the three scenarios explored there are some interesting differences in production worth contrasting. At the global level, the results of trade and domestic policy reforms that see efforts concentrated in developed countries produce an on balance effect of virtually no change in net agro-food production. In contrast, some concentrated increases in support and protection to agriculture by some regions see an increase in production, driven predominately from impacts seen in China and India, albeit with significant efficiency costs (discussed below). However, a more global effort to remove distortions to agro-food markets yields the largest positive production response.

Figure 3.15. Contrasting liberalisation reforms

% changes
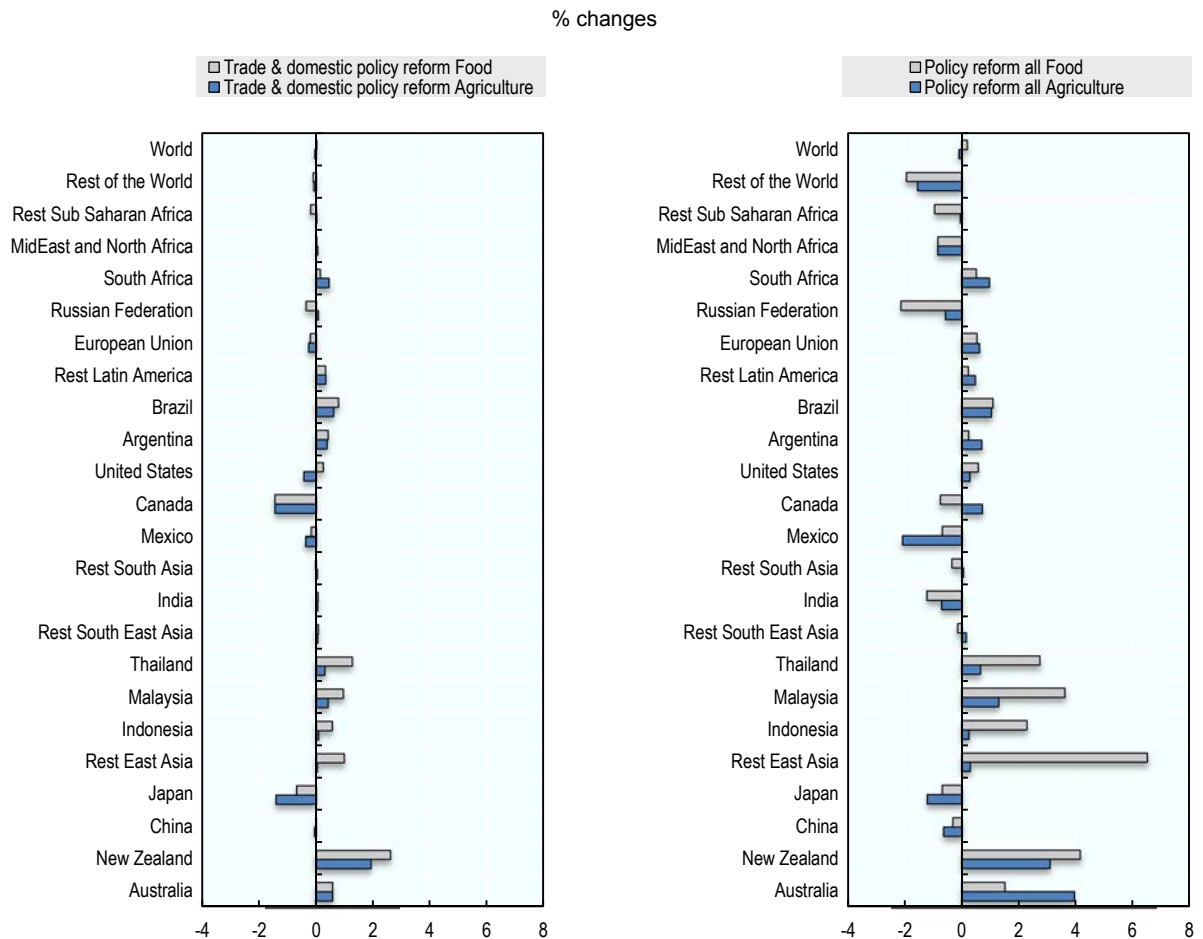
Source: Author estimates from METRO.

Trade

Under the *policy drift* scenario, the increasing levels of protection decrease trade in agro-food products (Figure 3.16). Agro-food imports decrease strongly, most notably in the regions with increasing protection (by up to 6%). Under this scenario, the effects on trade are concentrated in sectors that see the largest increases in protection. Countries increasing protection decrease their imports of these products, with effects on exports being distributed worldwide. Importantly, the effects of increases in protection in a few countries generally decrease exports for most regions. Exceptions to this are seen for agricultural exports from India, New Zealand, China and Malaysia, and food exports of Argentina (related to lower tariffs applied on vegetable oil products to India).

Figure 3.16. Impacts of trade and domestic policy reform and policy drift on trade

Trade reform

Policy drift

Exports (% changes)

Imports (% changes)
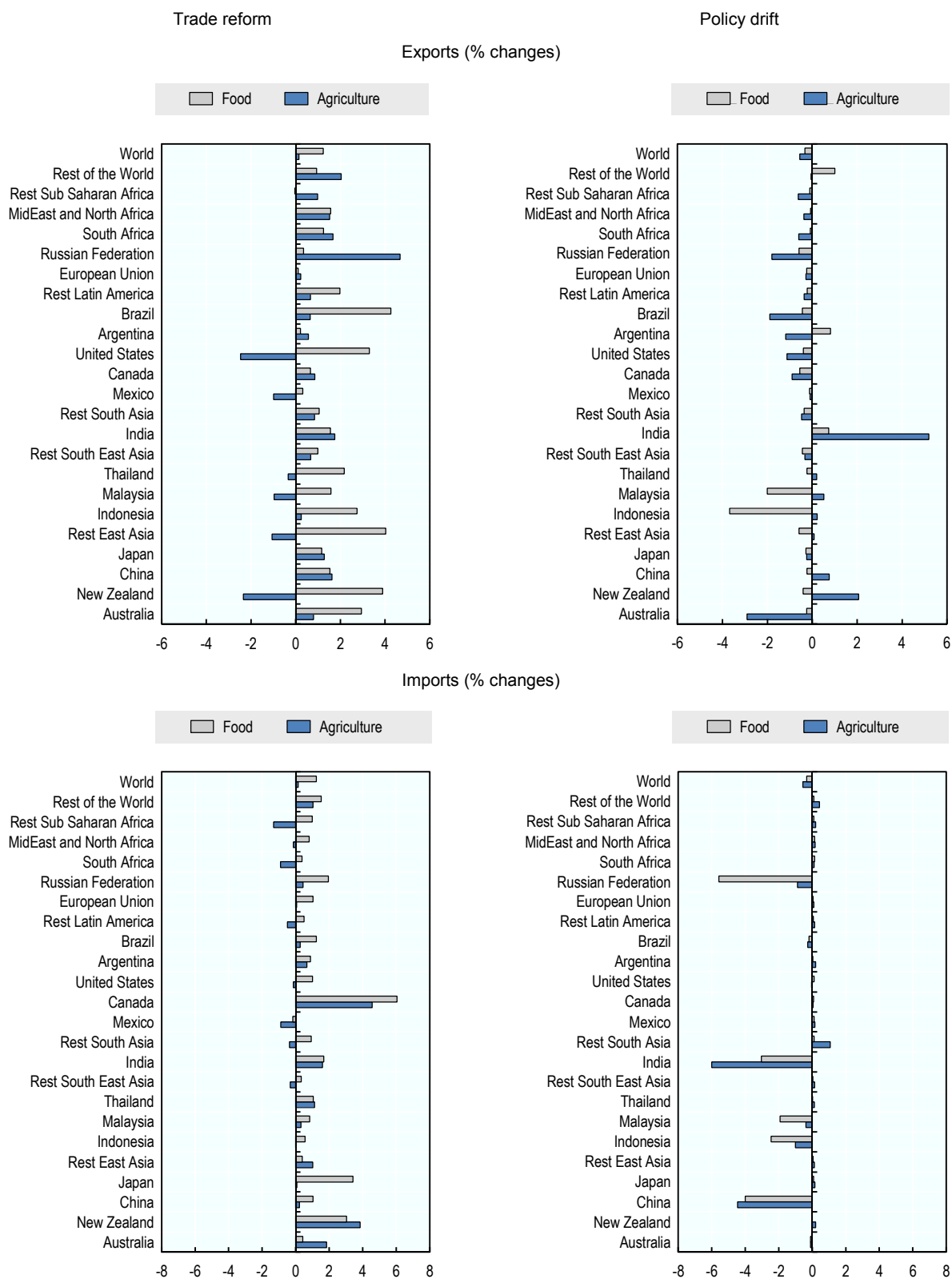
Source: Author estimates from METRO.

Figure 3.17. Impacts of trade and domestic policy reforms trade by use category

% changes
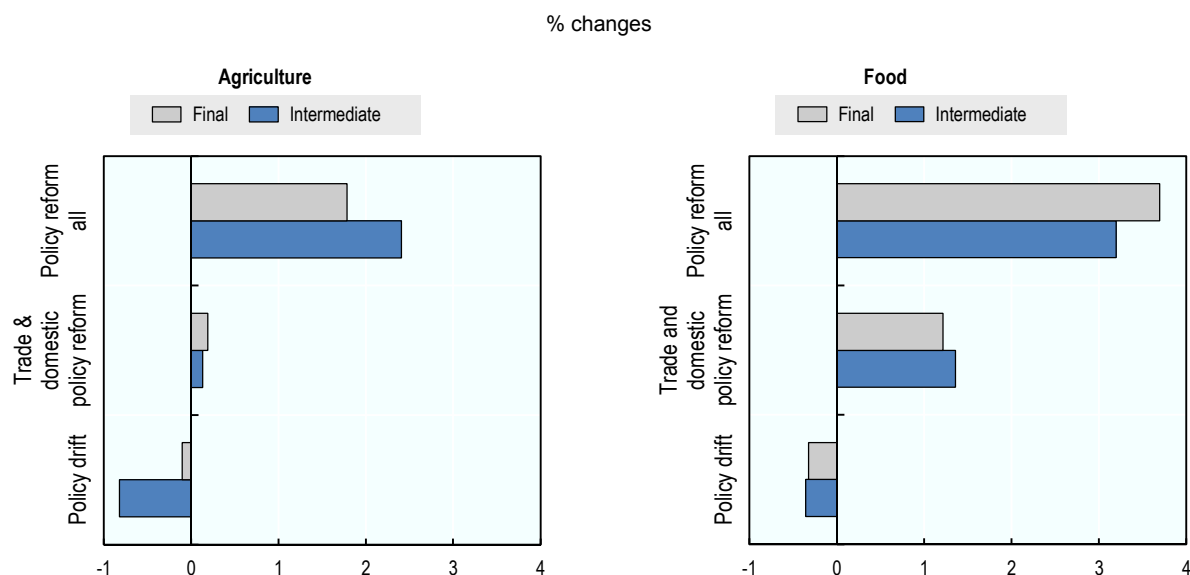
Source: Author estimates from METRO.

Reforms of the like described in the *trade and domestic policy reform* scenario, on the other hand, would increase trade. Agro-food exports and imports increase under this scenario in most regions. Total agro-food trade increases worldwide by just under 1%. In some countries the effects of reform differ across agricultural and food sectors, with some regions such as the United States and Mexico showing contractions in trade (and production) of agricultural products but see increases in trade (and production) of food products. In general, reforms move world production and trade towards levels that would be seen if policies were not in place (as described in Section 3.3) – the effects are just smaller.

When reforms are more widespread and analogous reforms take place across all countries (the *policy reform all* scenario), the effects are significantly larger. Total agro-food trade increases by 3% reflecting the wider coverage of reforms. For agricultural products, world trade increases by 2.1% from 0.1% and food increases by 3.5% from 1.2% compared with the *trade and domestic reform* scenario.

The results indicate that reforming agricultural markets would spur trade in intermediates to a greater extent that final goods. In both agricultural and food products, the changes in policies that take place within both the trade and domestic policy reform scenarios lead to larger increases in intermediates trade (Figure 3.17). In particular, for agricultural products, when developing countries reform their agro-food policies there is a significant increase in intermediate trade. This has implications for the development and participation in value chains by developing countries. It suggests that the policies that are currently in use are hampering developing countries participation in agro-food value chains and thereby limiting the potential gains available to agro-food sectors in these countries to exploit the potential benefits from GVCs.

Between the reform scenarios the effects on developed and developing countries differ. The main driver of the differences observed between the scenarios relate to the growing importance of so called 'south-south' trade. When reforms are concentrated in developed countries (*trade and domestic policy reform*), the trade effects on products sourced from developed countries are strongest for final goods. This scenario sees increased trade in final goods between developed countries and between developed countries and developing (Figure 3.18). In terms of intermediates, there is a substitution away from developed country products to developing. Developing countries on the other hand see more significant changes, with the effects on final good strongest (in line with generally higher rates of protection for final goods than intermediates). Exports to developed countries increase over 2%, considerably stronger than

the trade effects between developed countries. South-south trade in intermediate and final goods also increases, but to a lesser extent.

When reform efforts are more widespread (*policy reform all*) the effects are both larger and the relative effects on intermediates and final goods trade change. In particular, there are large increases in final goods trade between developed and developing countries. However, for developing countries, trade between developing countries increases significantly (and remains the same between developing and developed). What is observed is increased trade in both intermediate and final goods between developing countries suggesting that the development of 'south-south' GVCs would be particularly enhanced. The relative magnitudes of the trade effects also suggest that it is the barriers on trade between developing countries that are most influential on the outcomes for developing countries, with the effects of developed country policies playing a less significant role.

Figure 3.18. Impacts on agricultural and food trade by use category of reform
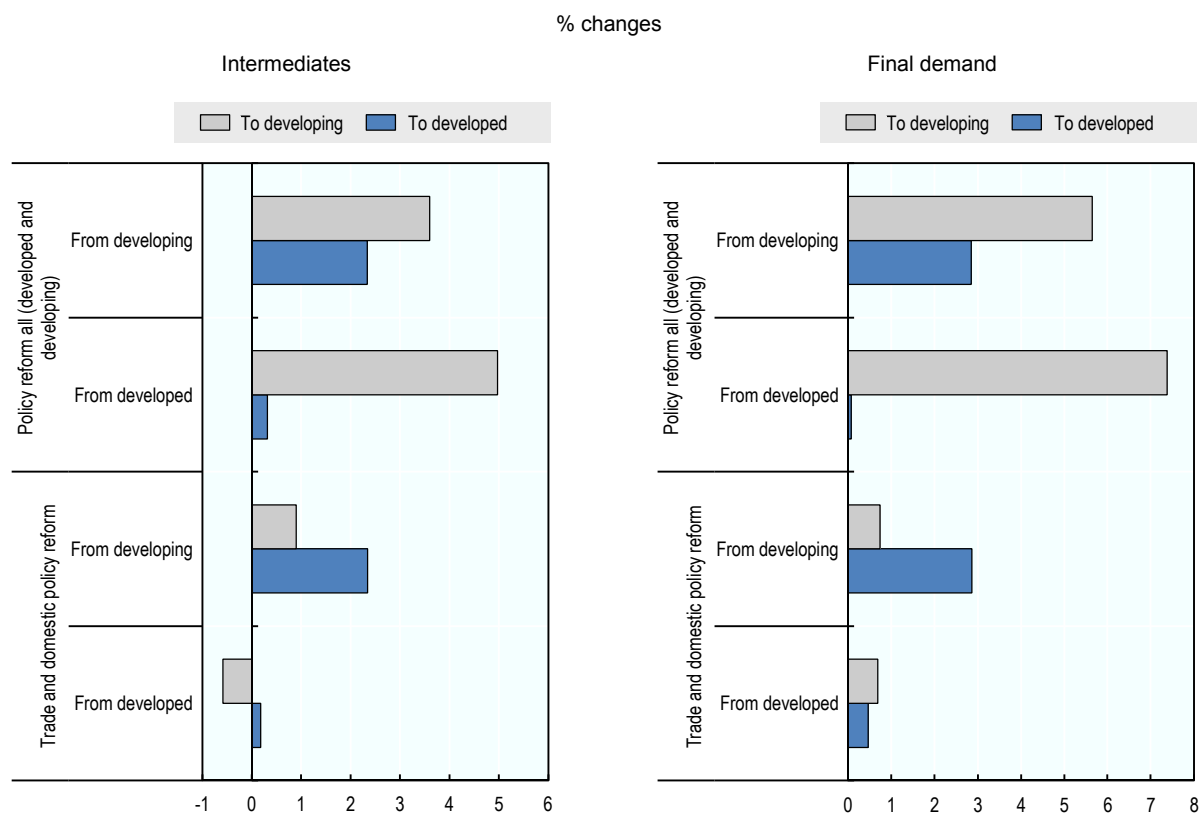
% changes

Source: Author estimates from METRO.

Under the more inclusive reform scenario (*policy reform all*) the effects on trade volumes for all countries are more significant as expected (Figure 3.19). However, changes in trade volumes also point to a number of interesting dynamics for individual countries. For India, for example, while production and exports of agricultural products decrease, exports of food products increase. This increase is driven by the lower price of intermediate inputs (sourced both locally and from imports) that result from the reforms. This creates an environment where the food processing sectors in India can become more internationally competitive, leading to increases in their exports. Changes like these help underpin the ultimate effects on economic activity and as such the benefits that are created from less distorted agricultural markets.

Figure 3.19. Impacts of developed and developing country reforms on trade

% changes
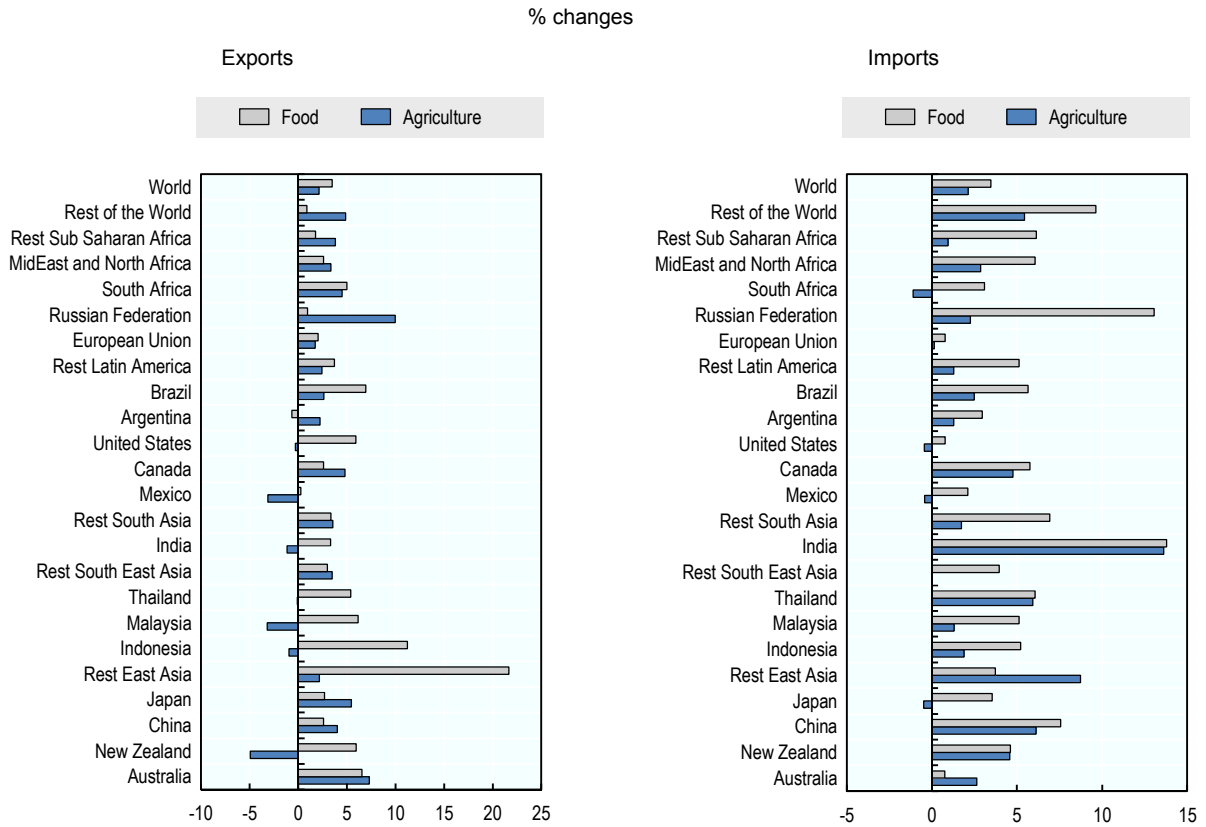
Source: Author estimates from METRO.

Private consumption and economic activity

Both the two trade and domestic policy reform scenarios and the policy drift scenario have a very small effect on the rest of the economy (Table 3.4). In aggregate, despite the sector specific impacts, there are only small changes in total production (across all commodities) in most economies. The largest production increases are seen in New Zealand (0.3%). Changes in aggregate imports and exports are dominated by the effects on agro-food trade. Effects are stronger when the trade reform includes developing countries, total imports and exports increase in all regions, except exports in Argentina which decrease slightly, 0.14%. Total production increases in most regions, with the largest increases in New Zealand, Rest of East Asia, Malaysia and Thailand. Total production decreases in the Russia Federation and India, while other regions do not show significant effects.

That said, for the countries that impose higher levels of protection on their agro-food sectors (*policy drift* scenario) the overall effects are generally negative. Indonesia is worst affected under the policy drift scenario with total production, total exports and total imports falling. This is due to both effects from their own policy decisions but also from those of others.

Trade reforms generally would have small but positive effects on private consumption, with larger effects seen under a scenario of more widespread reform efforts. Overall, New Zealand and Argentina see largest increases in private consumption – with Malaysia also experiencing larger gains if reforms were more widespread (Table 3.5). However, as noted above, variations between the winners and losses within countries mean that any transition needs to be carefully managed with the use of appropriate flanking policies such as social protection that allow for some redistribution of the possible gains. Flanking policies in some regions, such as Sub-Saharan Africa would also need to include policies that can promote the international competitiveness of the agro-food sectors. Under the two reform scenarios examined here,

this region did not capture the potential benefits for private consumption that were suggested to be on offer if global reform efforts where more significant (Table 3.3). Given a "complete" reform scenario is highly unlikely, policies of the latter form would help the region better capture any potential benefits that may be on offer from reforms in their trading partners (for example when developed countries reform their policies).

The effects on consumption under the policy drift scenario show the costs of rising levels of distortions to agricultural markets. For most regions, the welfare effects proxied by consumption are negative. Importantly, these effects are largest in the countries that put in place higher levels of distortion to their agricultural markets – China, India, the Russia Federation and Malaysia along with Indonesia all experience losses. For the latter two, trade, total production and income all fall (along with agro-food exports).

Table 3.4. Impact of reform and drift scenarios on total production

% change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russia	South Africa	Middle East and North	Rest Sub Saharan Africa	Rest of the World
Policy drift																							
Total imports	-0.15	-0.08	-0.22	0.01	0.01	-0.35	-0.26	-0.01	0.00	-0.08	0.04	0.01	-0.02	-0.04	-0.08	-0.31	-0.02	0.00	-0.33	-0.01	0.02	-0.01	0.03
Total exports	-0.11	-0.03	-0.25	0.00	0.00	-0.29	-0.15	0.01	0.01	0.28	0.10	0.00	-0.01	-0.02	0.03	-0.16	-0.01	0.00	-0.26	0.00	0.00	-0.02	0.01
Total production	-0.02	-0.02	-0.06	0.00	0.01	-0.02	-0.08	0.00	0.00	0.20	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01
Trade and domestic policy reform																							
Total imports	0.29	2.13	0.05	0.27	0.10	0.21	0.14	0.14	0.02	0.11	0.05	-0.01	0.19	0.05	0.58	0.77	0.14	0.09	0.19	0.09	0.07	0.05	0.15
Total exports	0.14	0.70	0.06	0.26	0.10	0.16	0.04	0.05	0.02	0.02	0.14	0.02	0.10	-0.01	-0.08	0.36	0.09	0.08	0.12	0.04	0.06	0.11	0.08
Total production	0.04	0.29	-0.01	0.02	0.06	0.00	0.04	0.03	0.00	-0.04	0.00	-0.01	0.00	0.00	0.04	0.04	0.02	0.01	-0.02	0.01	0.00	0.00	0.01
Policy reform all (developed and developing)																							
Total imports	0.74	3.50	0.32	0.14	0.37	0.99	0.46	0.45	0.23	0.18	0.37	0.02	0.37	0.19	0.97	1.63	0.43	0.08	0.58	0.29	0.25	0.33	0.41
Total exports	0.37	1.02	0.39	0.26	0.60	0.74	0.33	0.37	0.21	0.21	1.01	0.12	0.34	0.02	-0.14	0.70	0.46	0.07	0.67	0.19	0.38	0.65	0.49
Total production	0.10	0.51	0.02	0.01	0.41	0.05	0.22	0.14	0.02	-0.18	0.04	-0.02	-0.01	0.01	0.04	0.05	0.03	0.02	-0.07	0.04	-0.01	-0.01	0.00

Source: Author estimates from METRO.

Table 3.5. Impact of reform and drift scenarios on consumption

% change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russian Federation	South Africa	Middle East and North Africa	Rest Sub Saharan Africa	Rest of the World
Policy drift																							
Absorption	-0.01	-0.02	-0.01	0.00	0.01	-0.02	-0.11	-0.01	-0.01	-0.10	0.00	0.00	0.00	0.00	-0.02	-0.02	0.00	0.00	-0.03	0.00	0.01	0.00	0.01
Government consumption	0.00	-0.01	0.02	0.00	0.00	0.00	-0.04	-0.01	-0.02	-0.15	-0.02	0.00	0.00	0.00	-0.02	-0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.01
Private consumption	-0.02	-0.03	-0.05	0.00	0.01	-0.03	-0.19	-0.02	-0.01	-0.15	0.00	0.00	0.00	-0.01	-0.03	-0.03	-0.01	0.00	-0.06	0.00	0.01	0.00	0.01
Trade and domestic policy reform																							
Absorption	0.03	0.43	0.00	0.01	0.01	0.02	0.10	0.08	0.01	0.03	-0.01	0.00	0.03	0.01	0.12	0.05	0.01	0.00	0.02	0.02	0.00	-0.02	0.03
Government consumption	0.00	0.21	0.00	0.00	-0.05	0.01	0.06	0.04	0.01	0.04	-0.01	0.02	0.02	0.01	0.06	0.03	0.00	-0.01	0.01	0.00	-0.02	-0.03	0.02
Private consumption	0.05	0.65	0.01	0.02	0.03	0.02	0.15	0.13	0.01	0.05	-0.01	-0.01	0.05	0.02	0.17	0.08	0.02	0.01	0.03	0.03	0.00	-0.02	0.05
Policy reform all (developed and developing)																							
Absorption	0.08	0.74	0.00	0.01	0.10	0.06	0.36	0.15	0.05	0.15	-0.02	-0.01	0.07	0.03	0.20	0.12	0.01	0.02	0.04	0.06	-0.03	-0.07	0.07
Government consumption	0.01	0.37	-0.02	0.00	-0.33	0.01	0.13	-0.03	-0.02	0.13	-0.11	0.06	0.01	0.02	0.10	0.08	-0.05	0.00	-0.03	-0.01	-0.13	-0.19	-0.01
Private consumption	0.14	1.09	0.02	0.01	0.26	0.11	0.59	0.26	0.08	0.23	-0.02	-0.02	0.12	0.05	0.28	0.17	0.03	0.04	0.08	0.10	0.00	-0.07	0.12

Source: Author estimates from METRO.

Notes

1. Developed countries to which the shocks are applied include Australia, New Zealand, Canada, the United States and the European Union 28. For some, as tariff levels 0 or close to the actual shock is small.

2. In China, MFN tariffs are close to bound rates but applied rates are more than 25% lower than bound making the increase feasible. That said, the increase in applied ad valorem equivalents modelled as tariffs can also depict changes in quota arrangements and other barriers that act in the same fashion as tariffs.

3. Food production includes processed rice, meat from cattle, sheep, goats and horse, other meat, dairy products, vegetable oils and fats, sugar and other food products.

4. In METRO, unlike e.g. the GTAP model, household and government are linked through the tax rates only and expenditures are independent from each other.

5. Investment is assumed to change proportionally with absorption and is therefore not affected by distributional issues.

6. For more details see Annex Figure 3.A2.3 and compare with Annex Figure 3.A2.5.

References

Anderson, K., J. Cockburn and W. Martin (2011), "Would Freeing up World Trade Reduce Poverty and Inequality? The Vexed Role of Agricultural Distortions", *The World Economy*, Vol. 34/4, Wiley, New Jersey, pp. 487-515.

Bouët, A. and D. Larborde (2009), "The Potential Cost of a Failed Doha Round", *IFPRI Discussion Paper*, No. 00886, IFPRI, Washington, DC.

Bouët, A., J-C. Bureau, Y. Becreux and S. Jean (2005), "Multilateral Agricultural Trade Liberalisation: The Contrasting Fortunes of Developing Countries in the Doha Round", *The World Economy,* Vol. 28/9, Wiley, New Jersey, pp. 1329-54.

de Melo, J. and S. Robinson (1989), "Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies", *Journal of International Economics*, Vol. 27, Elsevier, Amsterdam, pp. 47-67.

Devarajan, S., J.D. Lewis and S. Robinson (1990), "Policy Lessons from Trade-Focused, Two-Sector Models", *Journal of Policy Modeling*, Vol. 12, Elsevier, Amsterdam, pp. 625-657.

Francois, J., H. van Meijl and F. van Tongeren (2005), "Gauging the WTO Negotiation's Potential Gains: Doha Round", *Economic Policy*, Vol. 20/42, Oxford University Press, Oxford, pp. 349-391.

McDonald, S., K.E. Thierfelder and T. Walmsley (2013), *Globe v2: A SAM Based Global CGE Model Using GTAP Data, Model Documentation*, available at: www.cgemod.org.uk/.

Narayanan, B.G., A. Aguiar and R. McDougall (eds.), (2012), *Global Trade, Assistance, and Production: The GTAP 8 Data Base*, Center for Global Trade Analysis, Purdue University.

OECD (2015), *METRO Version 1 Model Documentation,* OECD Publishing, Paris, www.oecd.org/ officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP(2014)24/FINAL&docLanguage=En).

OECD (2006), *Agricultural Policy and Trade Reform: Potential Effects at Global, National and Household Levels*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264025745-en.

OECD-Food and Agriculture Organization of the United Nations (2015), *OECD-FAO Agricultural Outlook 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/agr_outlook-2015-en.

Robinson, S., M.E. Burfisher, R. Hinojosa-Ojeda and K.E. Thierfelder (1993), "Agricultural Policies and Migration in a US-Mexico Free Trade Area: A Computable General Equilibrium Analysis", *Journal of Policy Modeling*, Vol. 15, Elsevier, Amsterdam, pp. 673-701.

Robinson, S., M. Kilkenny and K. Hanson (1990), *USDA/ERS Computable General Equilibrium Model of the United States*, Economic Research Services, USDA, Staff Report AGES 9049.

Tokarick, S. (2008), "Dispelling Some Misconceptions About Agricultural Trade Liberalization", *Journal of Economic Perspectives*, Vol. 22/1, AEA Publications, Pittsburgh, pp. 199-216.

Annex 3.A1

Regions, sectors and value added factors in the model

Table 3.A1.1. Regions in the study

No.	Code	Region	Comprising
1	aus	Australia	Australia
2	nzl	New Zealand	New Zealand
3	chn	China	China
4	rEAsia	Rest of East Asia	Hong Kong, Korea, Mongolia, Chinese Taipei, Rest of East Asia
5	jpn	Japan	Japan
6	rSEAsia	Rest of SE Asia	Cambodia, Lao PDR, the Philippines, Singapore, Viet Nam, Brunei Darussalam, Rest of South East Asia
7	idn	Indonesia	Indonesia
8	mys	Malaysia	Malaysia
9	tha	Thailand	Thailand
10	rAsia	Rest of South Asia	Bangladesh, Nepal, Pakistan, Sri Lanka, Rest of South Asia
11	ind	India	India
12	mex	Mexico	Mexico
13	can	Canada	Canada
14	usa	United States	United States
15	arg	Argentina	Argentina
16	rLAmerica	Rest of Latin America	Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, Rest of South America, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, Rest of Central America, Dominican Republic, Jamaica, Puerto Rico, Trinidad and Tobago, Rest of Caribbean.
17	bra	Brazil	Brazil
18	eu28	European Union (28)	Austria, Belgium, Cyprus[a) b)], Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Bulgaria, Croatia, Romania.
19	rus	Russian Federation	Russian Federation
20	zaf	South Africa	South Africa
21	MENA	Middle East and North Africa	Bahrain, Islamic Republic of Iran, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, Rest of Western Asia, Egypt, Morocco, Tunisia, Rest of North Africa.
22	sSSA	Rest of Sub-Saharan Africa	Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Guinea, Nigeria, Senegal, Togo, Rest of Western Africa, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Rest of Eastern Africa, Botswana, Namibia, Rest of South African Customs.
23	row	Rest of World	Rest of Oceania, Rest of North America, Switzerland, Norway, Rest of EFTA, Albania, Belarus, Ukraine, Rest of Eastern Europe, Rest of Europe, Kazakhstan, Kyrgyztan, Rest of Former Soviet Union, Armenia, Azerbaijan, Georgia, Rest of the World.

a) *Note by Turkey*: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus" issue.

b) *Note by all the European Union Member States of the OECD and the European Union*: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Authors' compilation.

Table 3.A1.2. Sectors in the study

No.	Code	Description	Comprising
1	apdr	Paddy rice	Paddy rice
2	awht	Wheat	Wheat
3	agro	Cereal grains nec	Cereal grains nec
4	av_f	Vegetables, fruit, nuts	Vegetables, fruit, nuts
5	aosd	Oil seeds	Oil seeds
6	ac_b	Sugar cane, sugar beet	Sugar cane, sugar beet
7	apfb	Plant-based fibres	Plant-based fibres
8	aocr	Crops nec	Crops nec
9	apcr	Processed rice	Processed rice
10	actl	Cattle, sheep, goats, horses	Cattle, sheep, goats, horses
11	aoap	Animal products nec	Animal products nec
12	armk	Raw milk	Raw milk
13	awol	Wool, silk-worm cocoons	Wool, silk-worm cocoons
14	acmt	Meat: cattle, sheep, goats, horse	Meat of cattle, sheep, goats, horse
15	aomt	Meat products nec	Meat products nec
16	avol	Vegetable oils and fats	Vegetable oils and fats
17	amil	Dairy products	Dairy products
18	asgr	Sugar	Sugar
19	aOfd	Processed Food	Food products nec, Beverages and tobacco products
20	Extraction	Mining and Extraction	Forestry, Fishing, Coal, Oil, Gas, Minerals nec.
21	TextWapp	Textiles and Clothing	Textiles, Wearing apparel
22	LightMnfc	Light Manufacturing	Leather products, Wood products, Paper products, publishing, Metal products, Motor vehicles and parts, Transport equipment nec, Manufactures nec.
23	HeavyMnfc	Heavy Manufacturing	Petroleum, coal products, Chemical, rubber, plastic prods, Mineral products nec, Ferrous metals, Metals nec, Electronic equipment, Machinery and equipment nec
24	Util_Cons	Utilities and Construction	Electricity, Gas manufacture, distribution, Water, Construction
25	TransComm	Transport and Communication	Trade, Transport nec, Sea transport, Air transport, Communication
26	OthServices	Other Services	Financial services nec, Insurance, Business services nec, Recreation and other services, Dwellings

Table 3.A1.3. Value added factors in the study

No.	Code	Description	Comprising
1	Land	Land	Land
2	tech_aspros	Technical	Includes ILO category Technical and Associate Professionals (major group 3)
3	clerks	Clerks	Includes ILO category Clerical Support Workers (major group 4)
4	service_shop	Service	Includes ILO category Services and Sales Workers (major group 5)
5	Off_mgr_pros	Professional	Includes ILO categories of Managers and Professionals (major groups 1 and 2
6	Ag_othlowsk	Ag & other	Includes Skilled Agricultural, Forestry and Fisheries Workers, Craft and Related Trades Workers, Plant and Machine Operators and Assemblers, and Elementary Occupations (major groups 6-9)
7	Capital	Capital	Capital
8	NatRes	Natural Resources	Natural Resources

Annex 3.A2.

Detailed results

Table 3.A2.1. Impact of removal of current policies: Contribution to production effects by region and sector

Regional share in total % change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico
Paddy rice	0.03	0.00	-0.08	-2.47	-0.06	-0.23	-0.09	0.58	0.03	-0.12	0.04	0.00
Wheat	-0.15	0.00	-0.36	-0.14	0.08	0.00	0.00	0.00	0.00	-0.77	-0.09	0.00
Cereal grains nec	-0.01	0.01	-0.15	-0.01	-0.04	-0.02	0.00	0.01	-0.01	0.01	0.00	-0.02
Vegetables fruit nuts	-0.01	0.00	0.05	0.07	0.03	-0.05	0.00	-0.04	0.04	0.07	-0.01	-0.06
Oil seeds	0.07	0.00	-2.09	-0.06	-0.20	0.87	0.73	-0.05	-0.01	-0.29	-0.01	0.00
Sugar cane sugar beet	0.16	0.00	-0.39	-0.10	0.07	-0.05	0.02	0.27	0.01	-0.92	-0.03	-0.12
Plant-based fibers	0.07	0.00	0.44	0.00	0.03	0.00	0.01	0.00	0.01	-1.07	0.47	0.04
Crops nec	-0.02	0.00	0.06	0.06	-0.09	-0.08	-0.28	-0.05	0.14	-1.13	-0.02	-0.08
Cattle sheep goats horses	0.36	0.27	-0.05	-0.22	-0.01	-0.01	0.00	-0.04	-0.05	-0.10	0.01	-0.11
Animal products nec	-0.01	-0.01	0.05	-0.39	0.19	-0.01	0.00	-0.02	-0.06	0.04	0.00	-0.03
Raw milk	0.04	0.23	0.05	-0.26	0.00	0.00	0.00	0.00	0.00	0.50	0.00	-0.02
Wool silk-worm cocoons	8.80	-0.40	-11.20	-0.01	0.08	0.00	0.00	-0.01	0.00	-0.24	0.02	0.00
Meat: Cattle sheep goats horse	0.38	0.32	-0.05	-0.40	-0.08	0.00	0.00	-0.04	-0.05	0.11	-0.01	-0.07
Meat products nec	-0.01	-0.02	-0.07	-0.61	0.13	0.00	0.01	-0.03	-0.07	0.01	-0.01	0.02
Vegetable oils and fats	-0.01	0.00	-1.44	-0.03	1.15	2.17	1.32	0.00	0.00	-0.73	-0.13	-0.03
Dairy products	0.07	0.15	0.04	-0.42	-0.03	0.00	0.02	0.00	0.02	-0.01	-0.05	-0.04
Processed rice	0.17	0.00	-0.07	-2.26	-0.09	-0.19	-0.20	0.72	0.11	-0.04	0.07	0.00
Sugar	0.07	0.00	-0.37	-0.28	0.24	-0.04	0.01	0.43	0.02	-0.49	-0.04	-0.15
Food products nec	0.03	0.00	-0.01	-0.02	0.45	-0.01	0.00	0.05	-0.01	-0.11	0.00	-0.01

Table 3.A2.1. Impact of removal of current policies: Contribution to production effects by region and sector (*cont.*)

Regional share in total % change

	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russian Federation	South Africa	MidEast and North Africa	Rest Sub Saharan Africa	Rest of the World	World total
Paddy rice	0.00	0.63	0.00	-0.02	-0.09	-0.01	-0.05	0.00	-0.09	-0.06	-0.01	-2.08
Wheat	1.64	-1.39	0.04	0.01	0.04	0.43	0.67	0.02	-1.43	-0.02	0.62	-0.81
Cereal grains nec	-0.02	0.35	0.06	0.12	-0.02	0.25	-0.01	0.12	-0.10	-0.11	-0.02	0.38
Vegetables fruit nuts	0.06	0.11	0.01	0.00	0.03	0.03	-0.09	0.01	0.01	-0.07	-0.03	0.16
Oil seeds	-0.04	0.26	-0.50	0.71	0.26	0.33	-0.02	0.00	0.01	-0.01	-0.04	-0.06
Sugar cane sugar beet	0.00	-0.05	0.01	2.10	0.21	-0.32	-0.11	0.01	0.06	-0.18	0.00	0.67
Plant-based fibers	0.00	-1.43	-0.01	-0.06	0.05	-0.01	0.00	0.00	0.20	0.35	0.33	-0.58
Crops nec	-0.34	0.21	0.01	-0.11	0.05	0.54	0.00	0.00	0.08	0.26	-0.17	-0.97
Cattle sheep goats horses	0.00	0.24	0.48	0.17	0.38	-0.24	-0.06	-0.01	-0.55	0.08	-0.49	0.06
Animal products nec	-0.03	0.27	0.06	0.28	-0.03	0.30	-0.10	-0.01	-0.01	-0.03	-0.26	0.20
Raw milk	-0.61	0.15	0.04	-0.06	-0.04	0.74	-0.08	0.00	-0.15	-0.02	-0.14	0.35
Wool silk-worm cocoons	0.00	0.01	0.02	-0.02	0.11	0.89	-0.02	0.54	0.08	0.01	0.14	-1.19
Meat: cattle sheep goats horse	0.09	0.38	0.53	0.20	0.58	-0.91	-0.42	-0.01	-0.45	0.20	-0.68	-0.38
Meat products nec	-0.03	0.78	0.11	0.78	-0.04	0.84	-0.61	-0.02	-0.08	-0.08	-0.64	0.38
Vegetable oils and fats	0.01	0.06	-0.53	-0.19	-0.10	0.17	-0.06	0.01	0.16	-0.10	-0.09	1.60
Dairy products	-0.84	0.26	0.04	-0.03	-0.08	1.72	-0.10	0.00	-0.12	-0.03	-0.07	0.52
Processed rice	0.00	1.42	0.00	-0.02	0.03	-0.07	-0.07	0.00	-0.03	-0.06	0.00	-0.58
Sugar	-0.01	-0.10	0.01	1.80	0.36	-1.02	-0.35	0.10	0.18	-0.26	0.04	0.13
Food products nec	-0.01	0.12	0.01	0.04	0.02	0.40	-0.03	0.01	-0.07	-0.03	0.03	0.87

Table 3.A2.2. Impact of removal of current policies: Production effects by region and sector

% changes

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico	Canada	United States	Argentine	Brazil	Rest Latin America	European Union	Russian Federation	South Africa	MidEast and North Africa	Rest Sub Saharan Africa	Rest of the World	World
Paddy rice	29.3	-0.7	-0.7	-32.9	-1.3	-2.6	-36.4	15.6	0.5	-1.5	0.8	-12.8	4.6	69.3	-2.5	-1.2	-3.2	-2.6	-20.1	-0.1	-2.7	-0.5	-2.2	-2.1
Wheat	-4.0	-1.8	-2.7	-73.5	47.8	-12.9	16.7	-51.5	10.6	-6.8	-2.1	1.1	46.7	-14.4	2.2	0.8	2.0	2.4	16.6	7.1	-8.9	-1.7	11.6	-0.8
Cereal grains nec	-1.3	9.2	-1.2	-18.1	-34.7	-1.0	1.9	3.8	-0.6	-0.2	0.3	-1.6	-1.3	1.5	2.3	2.5	-0.5	2.3	-0.8	17.3	-1.3	-0.3	-0.6	0.4
Vegetables fruit nuts	-1.2	-1.1	-0.4	2.4	2.2	-1.7	1.6	-2.9	1.8	0.6	-0.4	-4.0	11.3	1.6	1.7	-0.8	0.9	0.4	-3.2	1.1	0.4	-0.2	-1.0	0.1
Oil seeds	10.3	4.2	-17.4	-44.6	-76.0	16.9	11.2	-15.5	-1.0	-2.9	-0.2	4.7	-1.4	1.5	-7.1	5.8	9.3	4.0	-1.6	2.2	0.8	0.2	-2.3	-0.1
Sugar cane sugar beet	12.5	-0.2	-5.2	-15.1	35.4	-3.2	3.1	15.9	0.8	-6.3	-0.4	-4.5	0.4	-1.6	1.3	6.8	3.1	-5.4	-6.9	1.9	1.7	-4.2	0.0	0.6
Plant-based fibres	1.6	0.9	1.9	4.4	34.8	-2.0	7.1	0.6	4.0	-5.7	5.3	3.0	-0.4	-12.5	-1.4	-1.2	2.8	-0.5	0.1	0.6	1.8	5.8	8.3	-0.6
Crops nec	-2.2	-4.2	5.8	1.0	-6.6	-1.4	-55.9	-9.9	7.1	-6.4	-0.9	-6.1	-46.0	4.3	1.9	-0.9	0.6	2.5	-14.0	-0.9	5.7	3.4	-12.1	-1.0
Cattle sheep goats horses	11.7	22.9	-0.4	-12.8	0.1	-0.8	3.4	-17.9	-2.2	-2.3	0.8	-12.1	-0.1	1.6	17.6	1.9	9.3	-1.7	-3.7	-0.8	-9.2	1.9	-12.4	0.1
Animal products nec	-2.5	-10.6	-0.4	-17.1	8.3	-0.8	0.8	-2.2	-1.6	1.0	0.0	-2.0	-2.5	3.2	12.8	8.0	-0.4	2.2	-4.3	-1.3	0.0	-1.2	-11.8	0.0
Raw milk	3.5	8.8	-0.1	-11.0	0.7	-1.0	9.6	-1.6	0.4	2.0	0.2	-2.6	-36.7	1.2	3.4	-1.7	-0.7	3.5	-2.2	0.2	-1.3	-0.8	-3.2	0.3
Wool silk-worm cocoons	95.9	-35.3	-40.8	-0.6	4.8	-0.5	1.3	-3.4	-0.6	-2.3	5.3	-4.2	2.6	10.1	4.1	-0.2	7.7	64.0	-1.4	32.4	0.9	1.1	1.7	-1.3
Meat: cattle sheep goats horse	17.9	29.4	-1.7	-13.3	-3.8	-0.4	7.1	-18.3	-7.1	11.2	-0.5	-6.1	2.3	1.6	21.2	2.7	11.4	-6.3	-3.8	-0.5	-7.0	3.8	-22.1	-0.3
Meat products nec	-1.1	-9.7	-1.1	-22.4	6.5	0.1	7.9	-2.4	-2.9	1.9	-1.4	1.4	-1.7	4.8	18.1	16.5	-0.5	2.8	-30.5	-2.2	-1.9	-3.7	-33.8	0.3
Vegetable oils and fats	-2.0	0.7	-6.4	-2.0	126.4	27.7	13.1	0.7	-0.3	-11.5	-6.9	-3.6	0.2	0.9	-12.2	-2.5	-2.4	1.4	-3.1	2.1	5.3	-9.2	-4.8	1.5
Dairy products	4.8	10.5	-0.3	-13.4	-1.8	-0.5	9.6	0.4	5.6	-1.0	-1.0	-2.3	-41.5	2.1	3.6	-1.0	-2.1	4.5	-2.9	0.7	-1.7	-2.3	-1.3	0.5
Processed rice	39.2	-7.7	-1.2	-21.0	-2.7	-2.6	-35.4	17.3	1.4	-0.8	0.9	-0.9	-1.7	65.8	-0.8	-0.5	0.9	-3.5	-34.6	3.1	-1.1	-4.9	0.2	-0.6
Sugar	2.4	-8.9	-5.6	-13.0	36.0	-3.1	8.2	17.0	1.2	-5.0	-0.4	-4.9	-1.3	-1.5	1.8	10.9	4.9	-7.6	-7.5	8.4	3.2	-9.3	2.8	0.1
Food products nec	2.2	-0.3	-0.7	-0.3	24.3	-0.3	1.6	6.5	-0.2	-4.9	0.3	-0.8	-0.4	0.8	1.2	1.1	0.7	1.6	-1.5	1.8	-1.1	-0.8	1.3	0.8

Figure 3.A2.1. Impact of removal of current policies on export by use category
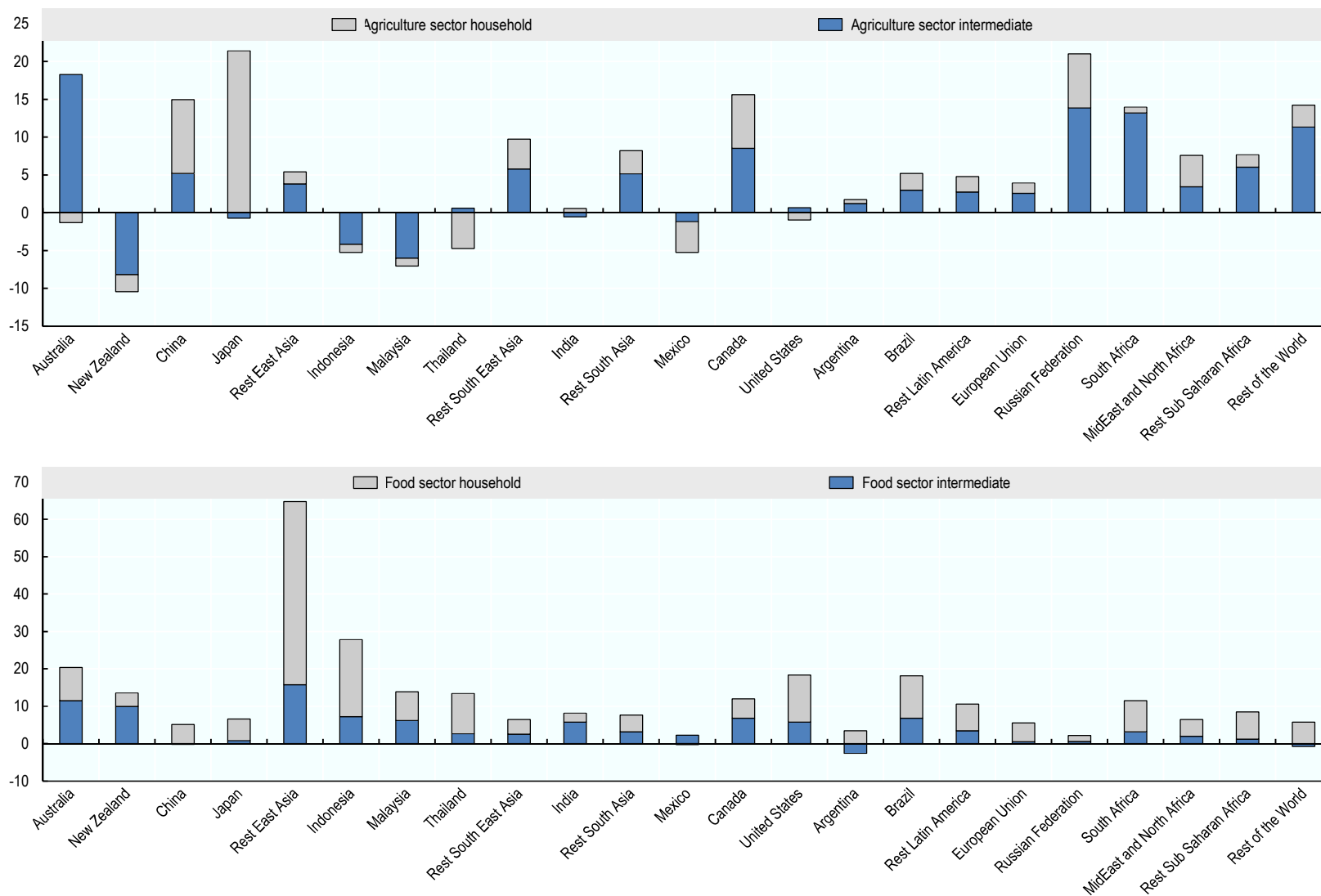
Table 3.A2.3. Scenario1: Effects of trade and domestic policy reform on production

Regional share in total % change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico
Paddy rice	0.00	0.00	-0.04	-0.08	-0.01	-0.02	-0.01	0.03	0.00	0.01	0.01	0.00
Wheat	0.07	0.00	-0.01	-0.05	0.01	0.00	0.00	0.00	0.00	0.02	0.00	-0.01
Cereal grains nec	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetables fruit nuts	-0.01	0.00	0.01	0.00	0.00	-0.01	0.00	0.00	0.00	-0.01	0.00	-0.01
Oil seeds	0.00	0.00	-0.23	-0.02	-0.02	0.09	0.08	0.00	0.00	-0.01	0.00	0.00
Sugar cane sugar beet	0.01	0.00	-0.02	-0.02	0.00	0.00	0.00	0.04	0.00	0.02	0.00	-0.01
Plant-based fibers	0.01	0.00	0.22	0.00	0.01	0.00	0.00	0.00	0.01	0.14	0.08	0.02
Crops nec	-0.01	0.00	0.02	-0.01	0.00	0.00	-0.02	0.00	0.00	0.01	0.00	0.00
Cattle sheep goats horses	0.05	0.17	0.00	-0.06	0.00	0.00	0.00	0.00	0.00	0.01	0.00	-0.02
Animal products nec	-0.01	0.00	0.01	-0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raw milk	0.00	-0.05	0.01	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wool silk-worm cocoons	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat: cattle sheep goats horse	0.07	0.20	0.00	-0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-0.01
Meat products nec	0.00	0.00	-0.01	-0.15	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Vegetable oils and fats	0.00	0.00	-0.18	0.00	0.05	0.20	0.15	0.00	0.00	-0.04	-0.01	-0.01
Dairy products	0.01	-0.03	0.01	-0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Processed rice	0.00	0.00	-0.01	-0.09	-0.01	-0.02	-0.02	0.04	0.01	0.02	0.01	0.00
Sugar	0.00	0.00	-0.02	-0.06	0.01	0.00	0.00	0.06	0.00	0.02	0.00	-0.01
Food products nec	0.00	0.00	0.02	-0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00

Table 3.A2.3 Scenario1: Effects of trade and domestic policy reform on production (*cont.*)

Regional share in total % change

	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russian Federation	South Africa	MidEast and North Africa	Rest Sub-Saharan Africa	Rest of the World	World total
Paddy rice	0.00	0.01	0.00	0.00	-0.01	-0.02	0.00	0.00	-0.01	-0.01	0.00	-0.15
Wheat	0.31	-0.74	0.01	0.00	0.06	-0.04	0.16	0.01	-0.01	0.05	0.12	-0.04
Cereal grains nec	-0.01	-0.07	0.01	0.02	0.00	0.00	0.00	0.01	0.00	-0.01	0.00	-0.05
Vegetables fruit nuts	0.00	0.05	0.01	0.00	0.00	-0.02	-0.01	0.00	0.01	-0.01	0.00	0.02
Oil seeds	-0.02	-0.11	-0.12	0.06	0.02	0.06	0.00	0.00	0.02	0.00	0.00	-0.20
Sugar cane sugar beet	0.00	0.04	0.00	0.43	0.03	-0.14	-0.01	0.00	0.02	-0.03	0.01	0.36
Plant-based fibers	0.00	-0.93	0.00	0.07	0.04	0.01	0.00	0.00	0.12	0.10	0.05	-0.06
Crops nec	-0.21	0.06	0.00	-0.01	0.01	0.04	0.00	0.00	0.02	0.02	-0.02	-0.11
Cattle sheep goats horses	-0.03	0.03	0.11	0.07	0.07	-0.35	0.00	0.00	-0.04	0.00	-0.04	-0.02
Animal products nec	-0.05	0.09	0.00	0.06	0.00	-0.02	-0.01	0.00	0.00	0.00	-0.02	-0.04
Raw milk	-0.01	-0.05	0.00	-0.01	0.00	0.06	-0.01	0.00	-0.01	0.00	-0.01	-0.13
Wool silk-worm cocoons	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Meat: Cattle sheep goats horse	-0.04	0.04	0.12	0.07	0.13	-0.71	-0.02	0.00	-0.02	0.00	-0.03	-0.29
Meat products nec	-0.19	0.23	0.00	0.17	0.01	-0.09	-0.04	0.00	0.00	-0.01	-0.04	-0.10
Vegetable oils and fats	-0.01	-0.03	-0.11	-0.03	0.00	-0.02	0.00	0.00	0.07	-0.01	-0.01	-0.01
Dairy products	-0.01	-0.04	0.00	0.00	0.00	0.15	-0.01	0.00	-0.01	0.00	0.00	0.01
Processed rice	0.00	0.02	0.00	0.00	0.00	-0.04	-0.01	0.00	0.00	0.00	0.00	-0.12
Sugar	-0.02	0.05	0.00	0.36	0.06	-0.46	-0.03	0.01	0.07	-0.05	0.02	0.00
Food products nec	-0.01	0.02	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.10

Table 3.A2.4. Scenario2: Effects of policy reform all on trade

Regional share in total % change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico
Paddy rice	0.00	0.00	-0.19	-0.08	-0.06	-0.10	-0.04	0.10	0.02	-0.07	0.02	0.00
Wheat	-0.02	0.00	-0.14	-0.05	0.03	0.00	0.00	0.00	0.00	-0.34	-0.04	-0.01
Cereal grains nec	0.00	0.00	-0.07	0.00	-0.02	-0.01	0.00	0.01	0.00	0.00	0.00	-0.01
Vegetables fruit nuts	0.00	0.00	0.02	0.00	0.01	-0.02	0.00	-0.01	0.01	0.04	0.00	-0.03
Oil seeds	0.03	0.00	-1.40	-0.02	-0.09	0.33	0.32	-0.02	0.00	-0.12	-0.01	0.00
Sugar cane sugar beet	0.06	0.00	-0.16	-0.02	0.02	-0.02	0.00	0.11	-0.01	-0.43	-0.02	-0.04
Plant-based fibers	0.07	0.00	0.27	0.00	0.01	0.00	0.00	0.00	0.01	-0.57	0.23	0.02
Crops nec	-0.01	0.00	0.01	0.03	-0.03	-0.03	-0.11	-0.01	0.04	-0.51	-0.01	-0.04
Cattle sheep goats horses	0.12	0.14	-0.02	-0.05	0.00	0.00	0.00	-0.01	-0.02	-0.05	0.00	-0.07
Animal products nec	-0.01	0.00	0.12	-0.10	0.08	0.00	0.00	0.01	-0.02	0.02	0.00	-0.02
Raw milk	0.01	0.07	0.03	-0.05	-0.01	0.00	0.00	0.00	0.00	0.25	0.00	-0.01
Wool silk-worm cocoons	3.39	-0.24	-4.48	-0.01	0.06	0.00	0.00	0.00	0.00	-0.13	0.01	0.00
Meat: cattle sheep goats horse	0.13	0.16	-0.03	-0.09	-0.04	0.00	0.00	-0.01	-0.02	0.05	0.00	-0.05
Meat products nec	0.00	-0.01	0.04	-0.15	0.05	0.00	0.00	0.02	-0.03	0.00	0.00	-0.01
Vegetable oils and fats	0.00	0.00	-0.73	-0.02	0.35	0.84	0.59	0.01	0.00	-0.26	-0.06	-0.01
Dairy products	0.02	0.05	0.02	-0.07	-0.02	0.00	0.01	0.00	0.01	0.02	-0.02	-0.02
Processed rice	0.00	0.00	-0.06	-0.09	-0.06	-0.08	-0.10	0.12	0.05	-0.02	0.02	0.00
Sugar	0.02	0.00	-0.16	-0.06	0.08	-0.02	0.00	0.17	-0.01	-0.22	-0.02	-0.04
Food products nec	0.01	0.00	0.00	-0.01	0.16	0.00	0.00	0.03	0.00	-0.05	0.00	-0.01

Table 3A2.4. Scenario 2: Effects of policy reform all on trade (*cont.*)

Regional share in total % change

	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russia	South Africa	MidEast and North Africa	Rest Sub-Saharan Africa	Rest of the World	World total
Paddy rice	0.00	0.06	0.00	-0.01	-0.04	-0.01	-0.02	0.00	-0.04	-0.03	-0.01	0.34
Wheat	0.58	-0.73	0.05	0.01	0.04	0.22	0.32	0.01	-0.63	0.00	0.19	0.48
Cereal grains nec	0.00	0.07	0.02	0.04	-0.01	0.09	-0.01	0.03	-0.05	-0.05	-0.02	-0.06
Vegetables fruit nuts	0.02	0.07	0.01	0.00	0.02	0.02	-0.04	0.00	0.01	-0.03	-0.01	-0.05
Oil seeds	-0.01	0.32	-0.15	0.32	0.07	0.15	-0.01	0.00	0.00	-0.01	-0.05	0.13
Sugar cane sugar beet	0.00	0.03	0.00	0.78	0.06	-0.12	-0.05	0.00	0.01	-0.08	0.00	0.24
Plant-based fibers	0.00	-0.83	0.00	0.00	0.03	0.00	0.00	0.00	0.11	0.17	0.16	0.25
Crops nec	-0.21	0.09	0.01	-0.05	0.06	0.22	0.00	0.00	0.02	0.13	-0.09	0.38
Cattle sheep goats horses	-0.01	0.10	0.13	0.04	0.10	-0.11	-0.03	0.00	-0.24	0.00	-0.20	0.17
Animal products nec	-0.04	0.13	0.01	0.09	-0.02	0.09	-0.05	0.00	-0.01	-0.01	-0.12	-0.18
Raw milk	-0.01	-0.04	0.01	-0.03	-0.03	0.19	-0.04	0.00	-0.08	-0.01	-0.10	-0.29
Wool silk-worm cocoons	0.00	0.00	0.01	-0.01	0.05	0.30	-0.01	0.19	0.03	0.00	0.07	0.62
Meat: cattle sheep goats horse	-0.01	0.13	0.15	0.05	0.16	-0.40	-0.20	0.00	-0.17	0.00	-0.22	0.13
Meat products nec	-0.11	0.35	0.01	0.27	-0.03	0.23	-0.27	-0.01	-0.04	-0.04	-0.28	-0.11
Vegetable oils and fats	0.00	0.05	-0.21	-0.08	-0.06	0.07	-0.03	0.00	0.04	-0.05	-0.09	-0.35
Dairy products	-0.01	-0.02	0.01	-0.01	-0.04	0.43	-0.05	0.00	-0.07	-0.02	-0.08	-0.13
Processed rice	0.00	0.03	0.00	-0.01	0.00	-0.03	-0.03	0.00	-0.02	-0.03	0.00	0.19
Sugar	-0.01	0.06	0.00	0.67	0.10	-0.39	-0.17	0.03	0.04	-0.12	0.01	0.04
Food products nec	0.00	0.05	0.00	0.01	0.01	0.17	-0.01	0.01	-0.03	-0.01	0.01	-0.24

Table 3.A2.5. Scenario3: Effects of policy drift on production

Regional share in total % change

	Australia	New Zealand	China	Japan	Rest East Asia	Indonesia	Malaysia	Thailand	Rest South East Asia	India	Rest South Asia	Mexico
Paddy rice	0.00	0.00	0.06	0.00	0.00	0.04	0.03	-0.02	-0.01	0.10	0.00	0.00
Wheat	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.34	-0.01	0.00
Cereal grains nec	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Vegetables fruit nuts	0.00	0.00	-0.02	0.00	0.00	0.01	0.00	0.00	0.00	-0.05	0.00	0.00
Oil seeds	-0.01	0.00	1.35	0.00	-0.01	-0.10	-0.12	0.00	0.00	0.03	0.00	0.00
Sugar cane sugar beet	-0.02	0.00	0.06	0.00	0.00	0.01	0.00	-0.01	0.00	0.44	0.00	0.00
Plant-based fibers	-0.07	0.00	-0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.74	-0.04	0.00
Crops nec	0.00	0.00	0.04	-0.01	-0.01	0.01	0.04	0.00	-0.02	0.49	-0.01	0.00
Cattle sheep goats horses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Animal products nec	0.00	0.00	-0.20	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Raw milk	0.00	-0.01	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	-0.23	0.00	0.00
Wool silk-worm cocoons	-1.21	0.13	1.42	0.00	0.03	0.00	0.00	0.00	0.00	0.14	0.00	0.00
Meat: cattle sheep goats horse	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat products nec	0.00	0.00	-0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetable oils and fats	0.00	0.00	0.46	0.00	0.00	-0.27	-0.21	0.00	0.00	0.07	0.00	0.00
Dairy products	0.00	-0.01	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Processed rice	0.00	0.00	0.02	0.00	0.00	0.03	0.07	-0.02	-0.02	0.09	-0.01	0.00
Sugar	0.00	0.00	0.06	0.00	-0.01	0.01	0.00	-0.02	0.00	0.23	0.00	0.00
Food products nec	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00

Table 3.A2.5. Scenario 3: Effects of policy drift on production (*cont.*)

Regional share in total % change

	Canada	United States	Argentina	Brazil	Rest Latin America	European Union	Russia	South Africa	MidEast and North Africa	Rest Sub Saharan Africa	Rest of the World	World total
Paddy rice	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.21
Wheat	0.00	0.03	0.00	0.01	0.00	0.00	-0.06	0.00	0.00	0.00	0.00	0.36
Cereal grains nec	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.04
Vegetables fruit nuts	-0.01	0.01	0.00	0.00	0.00	-0.01	0.01	0.00	0.00	0.01	0.00	-0.05
Oil seeds	-0.04	-0.38	-0.02	-0.30	-0.03	-0.02	0.00	0.00	-0.01	-0.01	0.03	0.37
Sugar cane sugar beet	0.00	0.00	0.00	-0.11	-0.01	0.00	0.02	0.00	-0.01	-0.01	0.00	0.35
Plant-based fibers	0.00	-0.10	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.03	-0.02	0.27
Crops nec	0.00	0.01	0.00	0.01	-0.02	-0.08	0.00	0.00	-0.02	-0.03	0.00	0.39
Cattle sheep goats horses	0.00	0.00	0.00	0.00	-0.01	-0.02	0.01	0.00	0.00	0.00	0.00	0.04
Animal products nec	0.00	0.00	0.00	0.00	0.00	-0.02	0.01	0.00	0.00	0.00	0.00	-0.21
Raw milk	0.00	0.01	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	-0.28
Wool silk-worm cocoons	0.00	0.00	-0.01	0.00	-0.02	-0.06	0.00	-0.05	0.00	0.00	-0.01	0.36
Meat: cattle sheep goats horse	0.00	0.00	0.00	0.00	-0.01	-0.03	0.08	0.00	0.00	0.00	0.00	0.03
Meat products nec	-0.02	-0.01	0.00	0.01	0.00	-0.05	0.11	0.00	0.00	0.00	0.00	-0.08
Vegetable oils and fats	-0.01	-0.03	0.06	-0.02	0.00	0.00	0.01	0.00	0.01	0.00	0.09	0.16
Dairy products	0.00	0.00	0.00	0.00	0.00	-0.03	0.02	0.00	0.00	0.00	0.00	-0.05
Processed rice	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.18
Sugar	0.00	0.00	0.00	-0.09	-0.02	-0.02	0.07	0.00	-0.02	-0.01	0.01	0.17
Food products nec	0.00	0.00	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.03

Annex 3.A3

Sensitivity of results to trade elasticities

METRO employs various trade elasticities that govern the response of the respective quantities to price changes. These are import and export elasticities on two different levels each. Depending on the elasticity level, a 1 percentage change of export prices has a lower or higher quantity effect. To test the sensitivity of model results to trade elasticities they were varied with the results compared to the basic setup. Figures 3.A3.1, 3.A3.2 and 3.A3.3 show effects on results with 15% lower elasticities and 40% higher elasticities on both the import and export side. The results are stable in respect to trade elasticities. Unsurprisingly, higher trade elasticities lead to stronger quantity effects and exports and imports increase stronger. In some regions, this leads to more positive effects in total consumption (absorption). However, besides the significant higher elasticities of 40%, the increases are moderate and relatively strong only in Japan. Lower elasticities on the other hand are decreasing the responsiveness to price changes, quantity effects are lower resulting in slightly lower changes.

**Figure 3.A3.1. Effects trade elasticity on absorption:
Lower elasticity -15%, base elasticity values and 40% higher elasticity**
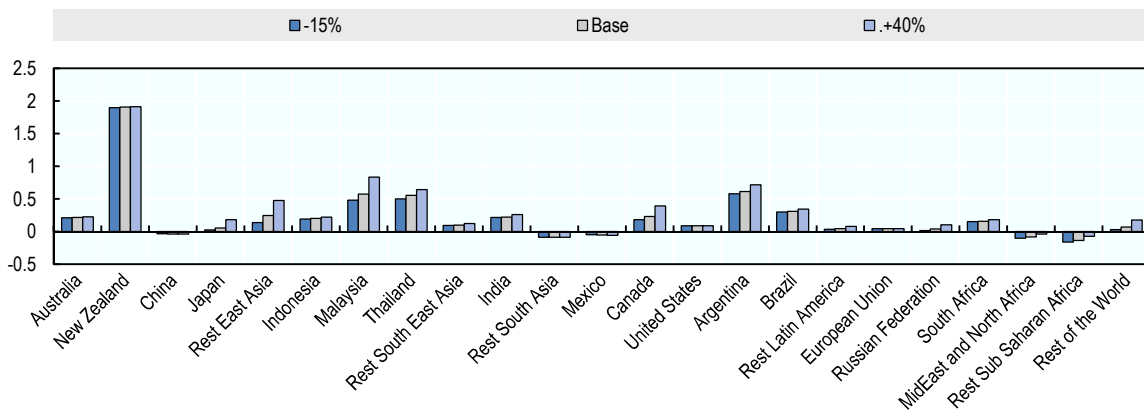
Figure 3.A3.2. Effects trade elasticity on imports:
Lower elasticity -15%, base elasticity values and 40% higher elasticity
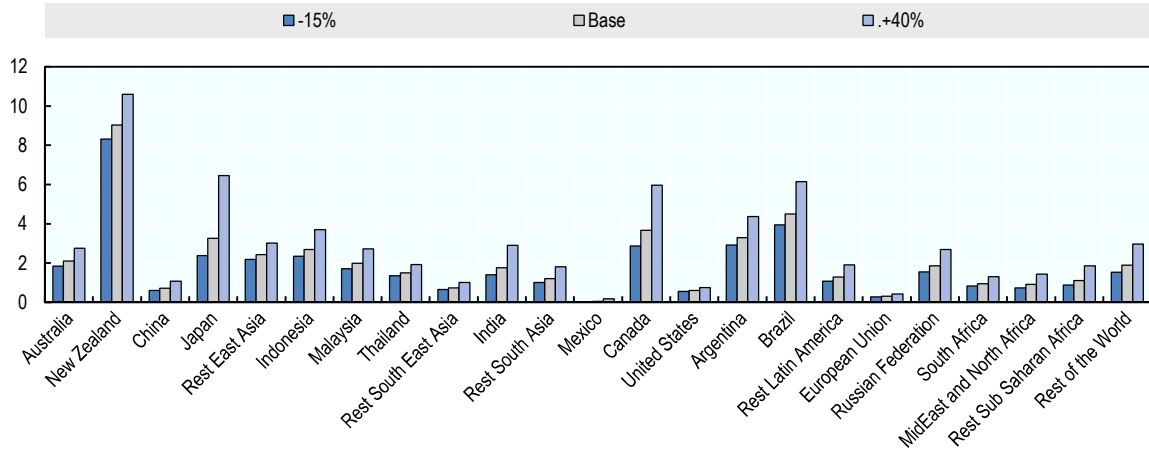
Figure 3.A3.3. Effects trade elasticity on exports:
Lower elasticity -15%, base elasticity values and 40% higher elasticity