

Advancing a Policy Dialogue



Series II: Addressing Issues and Perspective on Policy Options

Policy Goals, Objectives, and Instruments in Other Jurisdictions

FEBRUARY 2011

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About this publication

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SUMMARY

Government intervention in the agri-food sector varies significantly from country to country. At the farm level, for example, the rate of government assistance (assistance as a share of market value of production) is 28% in the EU, 6% in Brazil, 10% in the US, and 19% in Canada (as reported by the OECD for the 2006 to 2008 period). Australia's has fallen from a 10% level 20 years ago to 4.1%, driven down by the country's focus on competition, the level of government resources, and the elimination of economic distortions from government intervention. Noticeable trends also emerge in the level and form of assistance. When expressed as a percentage of output value, the level of support has declined in general, with a larger share of support decoupled from, or not directly linked to, output. This transformation is in large part a response to WTO rules, which provide incentives for non-trade-distorting programming. As well, the portion of assistance provided by taxpayers has increased across the OECD, from 23% in the late 1980s to 53% today. This reflects in large part the effect of lower binding tariff levels, which is an outcome of WTO negotiations. As a result, government intervention in the sector is less trade-distorting than in the past, with the possible exception of the US situation.

In China and Brazil, the level of intervention is low compared with the OECD average. These countries have removed distortions and the net tax imposed on their agri-food sectors. China and Brazil have refocused their macro-economic policies and are emphasizing productivity improvements to increase supply and to be low-cost suppliers. Agricultural support has helped these countries integrate more fully into the world trading system, thereby improving their export earnings, their rural development, and their internal food security. Brazil currently has a low-cost supply-push export strategy.

Agri-food policies in some countries, including the Netherlands and Australia, focus on competitive positioning through R&D, innovation, and a consumer-pull strategy. The Australian Department of Agriculture states that its primary goal is to

facilitate the development of self-reliant, profitable, competitive, and sustainable farms and industries. Australia bases its policy on its comparative advantages, as well as developing competitive advantages through global supply chains and industry clusters. Its current national policy focuses on R&D expenditures and finding innovative approaches to reducing greenhouse gases, improved soil management, and adapting and adjusting to climate change.

As the fourth largest agri-food exporter (after the US, EU, and Brazil), Canada is more export-dependent. The export value of Canada's agri-food products was 93% of the value of farm production in 2008, while the export value of the top three exporters was well under 50% of the value of farm production. Exporters such as the US and Australia have stated that increasing exports is a priority, and Brazil has a low-cost supply-push strategy. Canada's export strategy should account for the priorities of these competitors.

In the EU and US, there is an ongoing debate over whether to accommodate societal concerns such as food safety, food quality, animal welfare, sustainability, environmental considerations, and concepts such as carbon footprints. Policy interventions in the areas of biofuels, adaptation to climate change (carbon taxes and green tariffs), and climate change mitigation (producer rebates for specific production practices) can have large impacts on the global agri-food sector. The pace of change may be slow due to political pressures and lobbying of vested interest groups to maintain the status quo. At the same time, interest groups can leverage these policy issues into new means to support farm incomes and promote rural development.

As Canada moves forward on developing policies for the agri-food sector, its sights should focus on countries such as Australia and the Netherlands. By contrast, Canada has little to learn from American-style interventions.

This paper compares agri-food policy goals and instruments in Australia, Brazil, China, European Union, the Netherlands, Slovakia and the United States. The first section looks at historical trends in policy interventions, using data from the OECD and the recent World Bank project on assistance to agriculture.¹ It compares policy instruments across countries and compares intervention levels across commodities. The second section describes future policy developments and the domestic political rationale in each country. The third section compares policy goals. The final section briefly describes the implications of the comparisons and suggests how policymakers can best position Canada's agri-food sectors.

Historical Policy

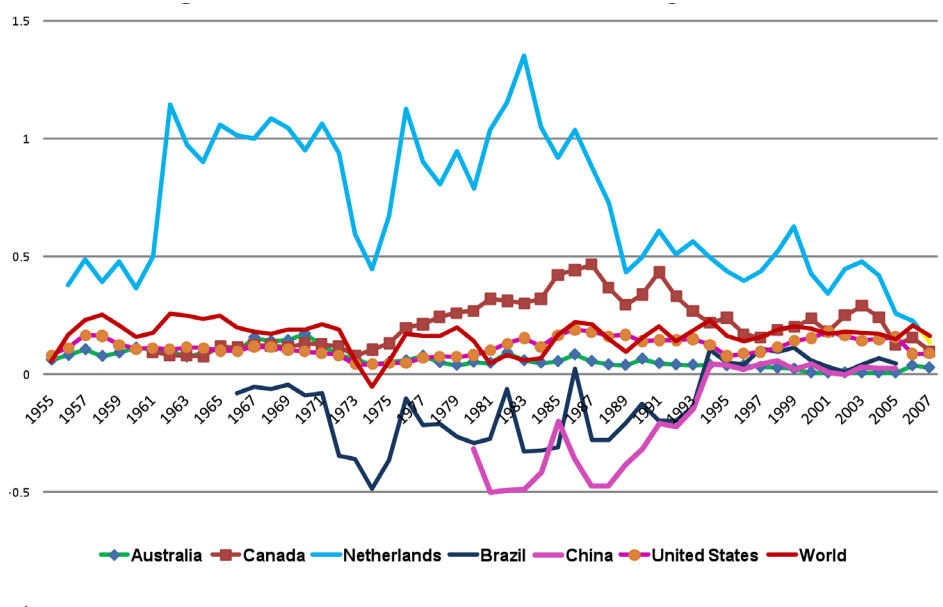
There are two key patterns of protection and support for agriculture: the income elasticity of protection and the anti-trade bias. The first pattern has subsidies increasing (or taxation of agriculture decreasing) as per capita income increases. The anti-trade bias is reflected in the fact that importables receive more protection (or less taxation) than exportables. Both of these policy biases are evident in the data.

Figure 1a shows the historical level of the nominal rate of assistance to agriculture for each of the countries under consideration (countries are separated out in Figures 2 and 1c.² Historically, the two developing countries, Brazil and China, taxed agriculture severely. Their approach can be segregated into three policy categories: 1) protection of manufacturing, which taxed agricultural inputs directly and indirectly diverted resources away from export sectors; 2) overvalued exchange rates, which is a tax on exports and a subsidy on imports; and 3) suppressed producer prices

for commodities through government procurement policies (especially through agricultural marketing boards), export taxation and export quotas. These governments often attempted to offset part or all of these disincentives on producers by subsidizing input prices and investing in irrigation and other capital inputs (see World Bank 1986 for an excellent overview). This broadly matches the historical policy regime in Brazil and China. But unlike China, Brazil did not pursue government imports of basic staples and direct controls on food prices.

The anti-trade bias is reflected in the fact that importables such as wheat had a rate of assistance averaging 30% from 1995 through 1999 for China (8% for Brazil) while exportables as a group had negative rates of assistance in that same time period for both countries. But for both countries, protection converged almost to zero for most commodities for the 2000-05 period.

Figure 2 shows some indication that protection has declined in recent years, especially for the Netherlands (both because of recent reforms in the EU's Common Agricultural Policy and because the World Bank project data does not include decoupled payments), as well as for Australia. The historical level of assistance in the Netherlands is high because the EU was historically a net importer of agricultural products when the Common Agricultural Policy was established, becoming a net exporter only in recent



Source: Kym Anderson World Bank Study 2009.

Figure 1a. Nominal Rates of Assistance to Agriculture.

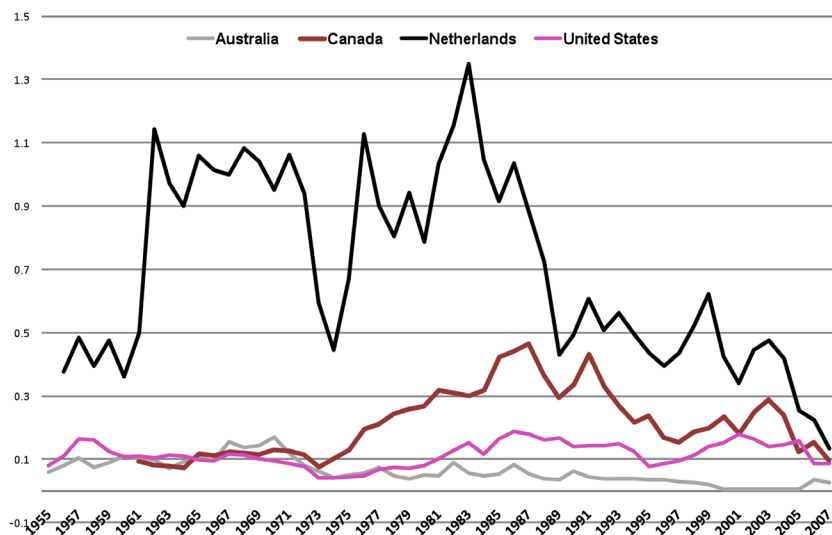


Figure 1b. Nominal Rates of Assistance to Agriculture (Australia, Canada, Netherlands, United States).

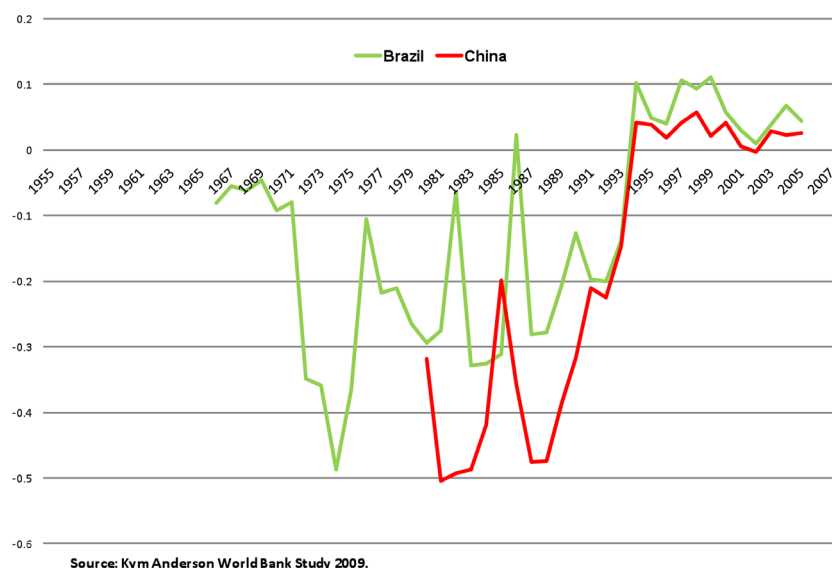


Figure 1c. Nominal Rates of Assistance to Agriculture (Brazil and China).

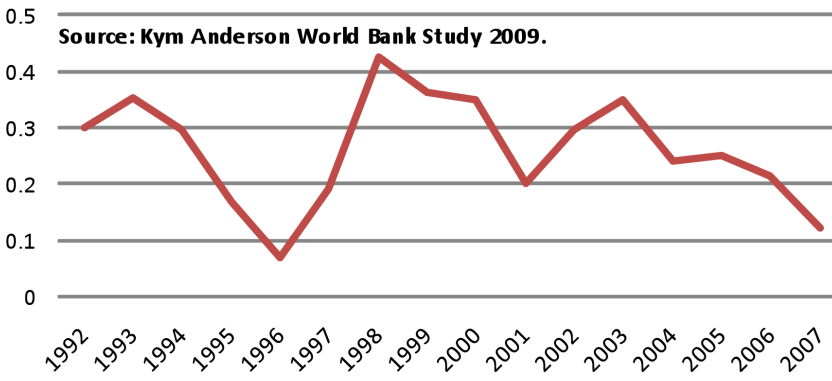


Figure 1d. Nominal Rates of Assistance to Agriculture (Slovakia).

years. This trend, along with other factors, precipitated EU policy reforms, such that now the EU rate of assistance is converging with that of other countries. Historically, only the US has exhibited a general tendency toward increasing assistance to agriculture (although it should be noted that World Bank data exclude decoupled payments).

Figure 1d provides nominal rates of assistance in Slovakia for 1992-2007. The rates of protection in Slovakia have been uneven since the fall of the Berlin Wall, reflecting general chaos in the political economies of the region, especially for agriculture (Anderson and Swinnen 2009). Prior to the fall of the Berlin Wall, Slovakia, like so many other former communist states, heavily taxed agriculture. It implemented these taxes through collective farm property rights, centrally controlled organization of resource allocation, production, processing, input provision and product marketing, distorted (or an absence of) prices, and state-controlled trading (including foreign currency exchange). Toward the end of the Soviet era, producers of farm products were strongly subsidized through high output prices and low input prices. But they faced indirect taxation with overvalued exchange rates and protection of most (heavy) industry (Swinnen and Rozelle 2006).

A summary of OECD data is given in Figures 2a,b,c,d (note that support for Brazil and China are for the 1995-07 and 2005-07 periods). OECD data incorporate all types of programs, including decoupled subsidies but not "General Services," such as expenditures on R&D, inspection and promotion.

Figure 2a shows that producer support has always been low in Australia, Brazil, and China and has become so in the US. But support is increasing in developing countries like Brazil and China, as expected with the income elasticity of protection

described earlier. Protection has declined the most in Canada and the US, while the EU's decline mirrors that of the OECD as a whole.

Figure 2b shows that the taxpayer share of support has increased for all of these countries. This trend in part reflects the disciplinary effect of binding tariffs and export competition commitments since the Uruguay Round of WTO negotiations. Taxpayer share of support is now about 50% for all OECD countries and has significantly increased in Australia and the EU.

Figure 2c shows the share of taxpayer support that requires production or input use – i.e., not fully decoupled (payments based on output, input, area planted, animal numbers, receipts or income). Taxpayer-financed subsidies that are not fully decoupled have declined significantly in the EU and US and for the OECD average (less so in Canada) but have increased in China and Australia.

Figure 2d shows the level of General Services' expenditures (e.g., research and development) as a share of value of output. Only the US is above the OECD average in both time periods. Surprisingly, Australia is well below the average but has increased the most compared with all other countries.

Policy instruments compared

Figures 3a through 3g depict the different types of policy instruments used for each country under consideration. For the OECD as a whole, support based on commodity output has declined from 82% in 1986-88 to 49% in 2007-09. Payments based on inputs, meanwhile, increased from 8% of total PSE to 13%. The other dramatic change is the share of payments for which production is not required, increasing from 1% of PSE to 23%, almost a quarter of total support.

Australia's change in composition of PSE is the most dramatic, with support based on output collapsing from 71% of total PSE to zero (Canada's declined from 59% to 53% over the same period – see Figure 3d). The share of payments based on input use increased substantially in Australia. (Although Australia's PSE declined substantially over the period

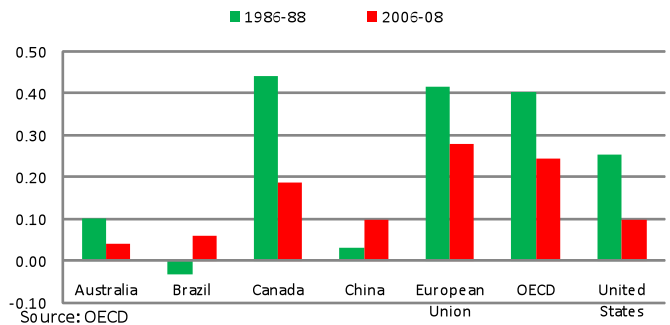


Figure 2a. PSE as a Share of Output.

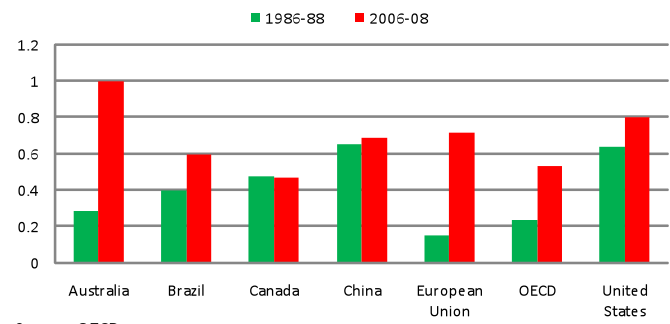


Figure 2b. Taxpayer Share of PSE.

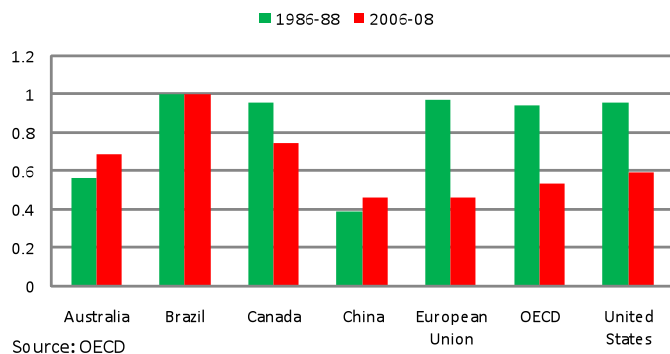


Figure 2c. Taxpayer share based on Output.

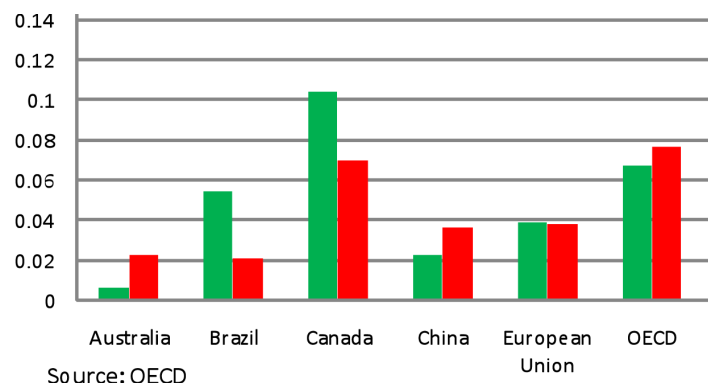


Figure 2d. General Services Share of Value of Output.

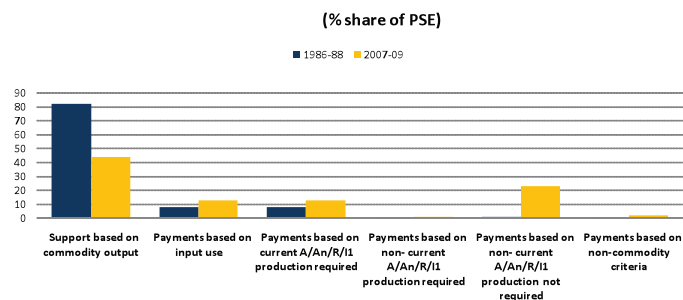


Figure 3a. OECD PSE Composition.

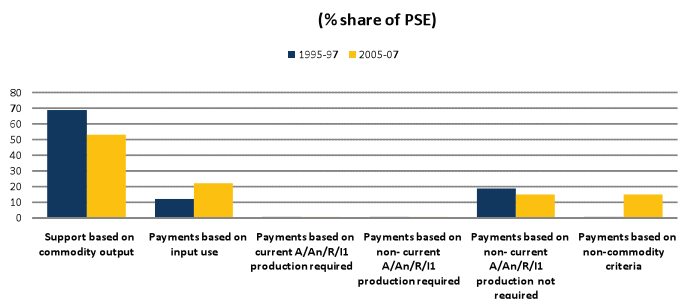


Figure 3e. China PSE Composition.

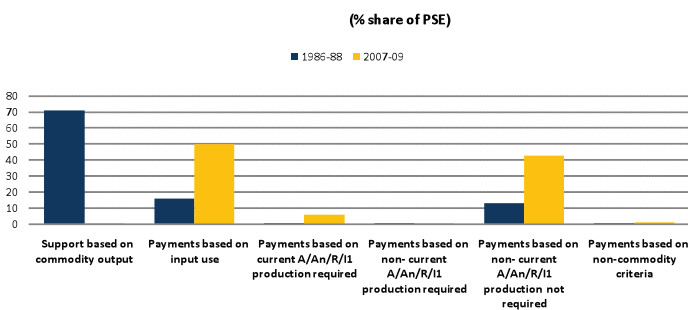


Figure 3b. Australia PSE Composition.

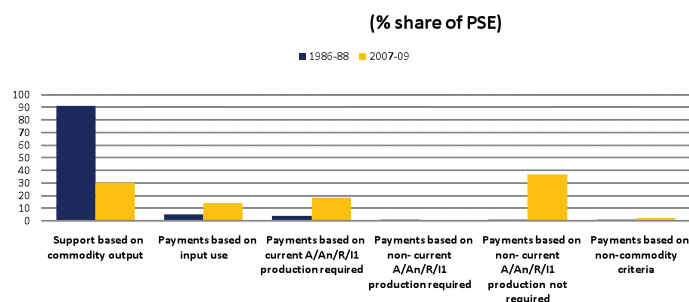


Figure 3f. European Union PSE Composition.

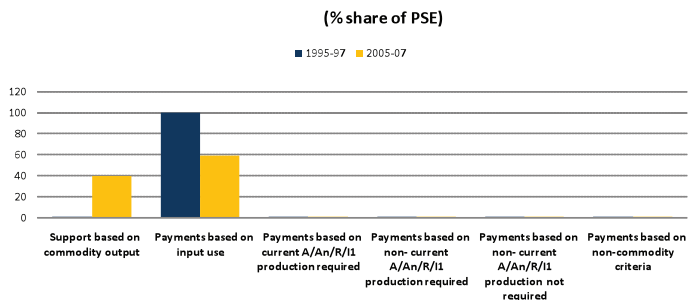


Figure 3c. Brazil PSE Composition.

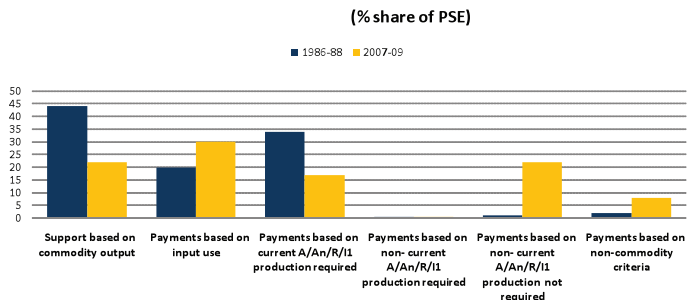


Figure 3g. United States PSE Composition.

Source for Figures 3a-g: Agriculture Policies in OECD Countries At a Glance, OECD Paris, July. 1. A = area planted; An = animal numbers; R = receipts; I = income.

more stable, with an increase in support based on commodity output matched by a decline based on input use (Figure 3c). Canada's composition also changed little, with payments based on input use declining the most (from 18 to 8% of total PSE – see Figure 3d). Payments not requiring production rose from zero to 9% of total PSE, the only other remarkable development in Canadian policy.

China's composition of policy instruments is also stable, with decreases in support based on output offset by increases in input subsidies (the opposite case of Brazil) with an increase in payments based

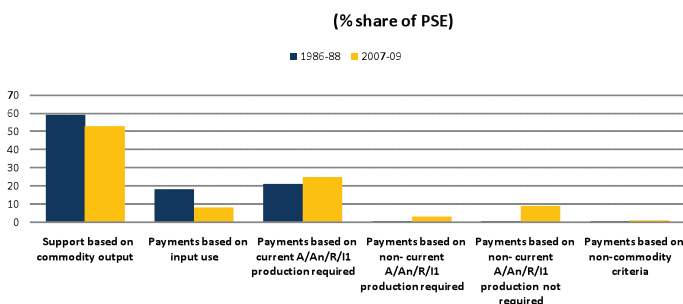


Figure 3d. Canada PSE Composition.

– the data in Figure 3b refer to the share in support of the total PSE – the share of distorting support declined substantially in Australia, unlike in Canada.)

In Brazil, the composition of policy instruments is

on non-commodity criteria being the only notable change, increasing from 1% to over 10% of total PSE.

The EU reduced support based on output substantially (from 91 to 30%) and increased payments on all other criteria, most notably for payments where production is not required (from zero to 37% of total PSE).

The US shows similar changes in the types of policy instruments as the EU, except the relative changes are less pronounced. (The decline in payments requiring production declined substantially while slightly increasing in the EU.)

Commodities compared

OECD data in Figures 4a and 4b show that in OECD countries grains and oilseeds have enjoyed a higher average level of assistance than other commodities. However, unlike other commodities in Figure 4b, support is declining more for the grains and oilseeds sectors, which experienced a larger increase in the share of taxpayer financed domestic support.³

Table 1 shows how rates of assistance vary across commodities for the world as a whole (using data from the World Bank project). Patterns of protection across commodity groups differ from commodity support in the OECD countries only reported earlier. Surprisingly, livestock products are consistently higher than grains and oilseeds, presumably because developing countries keep grains and oilseeds product prices low for consumers.

A more detailed look at support for individual countries using OECD data is given in Figures 5a,b,c,d, and e. What is remarkable is the dramatic drop in protection overall in most individual commodity support, especially for field crops, milk, and eggs (Figure 5a). Australia has eliminated most support that had been concentrated in the wheat, milk, and egg sectors (Figure 5b). Canada, too, has reduced support in these commodities, although support for milk and eggs has not dropped as much as the OECD average (Figure 5c). The EU has maintained its support to the beef and egg sector and increased it substantially in the poultry sector (Figure 5d). The US has only increased support for poultry, and substantially so (Figure 5e).

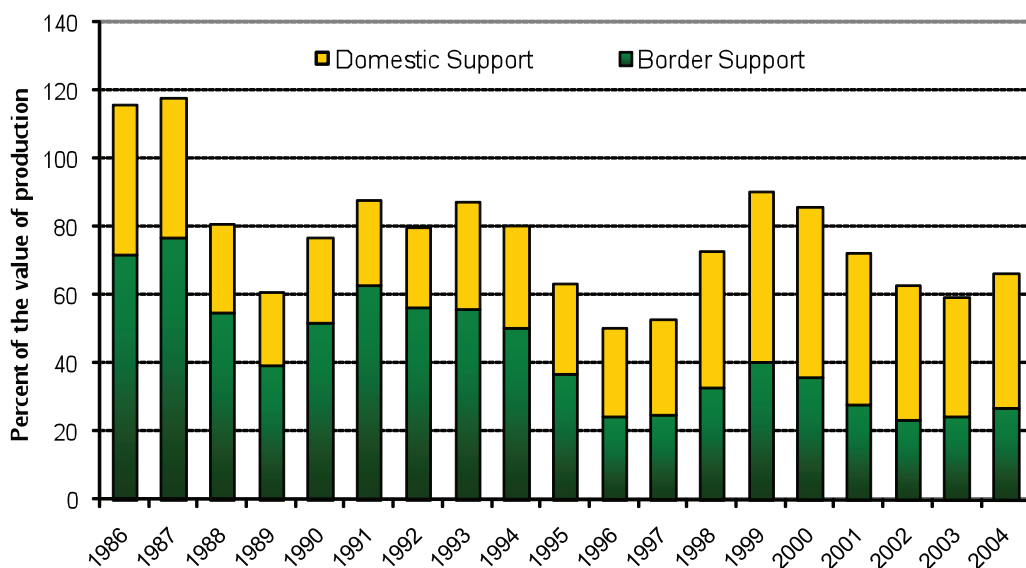


Figure 4a. OECD Protection in Grains and Oilseeds. Source: OECD.

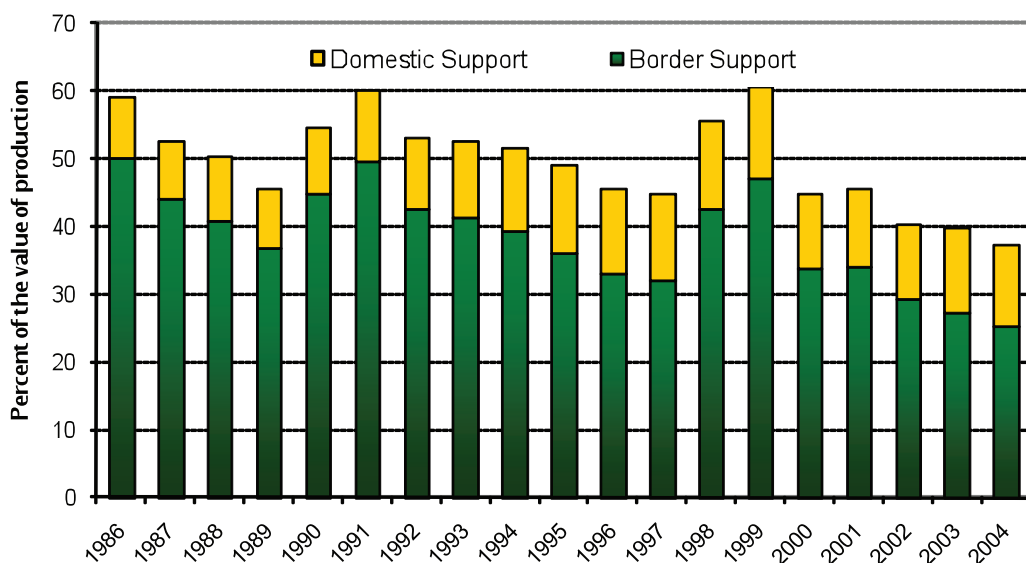


Figure 4b. OECD Protection in Other Commodities. Source: OECD.

Table 1. Nominal Rate of Assistance (%).

	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Grains and oilseeds	11	6	5	-3	21	16	14	17
Rice	6	11	12	-10	26	25	23	39
Wheat	22	7	2	9	32	23	12	6
Maize	8	5	2	-3	12	3	6	7
Soybean	1	0	-2	-1	-2	1	7	4
Livestock products	46	39	50	30	42	35	30	27
Milk	97	91	140	138	151	85	62	53
Beef	14	12	13	25	43	29	31	23
Pig meat	47	36	31	-16	-11	4	10	10
Poultry	20	26	26	29	21	26	20	19

1. The group averages refer to 30 key products, and in total there are more than 70 products covered by the project, even though only 12 are shown separately here

2. Weighted average using value of production at undistorted prices.

Source: Kym Anderson World Bank project

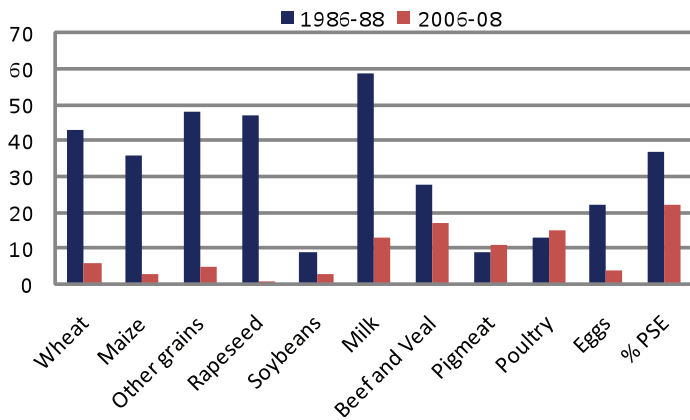


Figure 5a. OECD: Producer Single Commodity Transfer. Source: OECD PSE/CSE Database 2010.

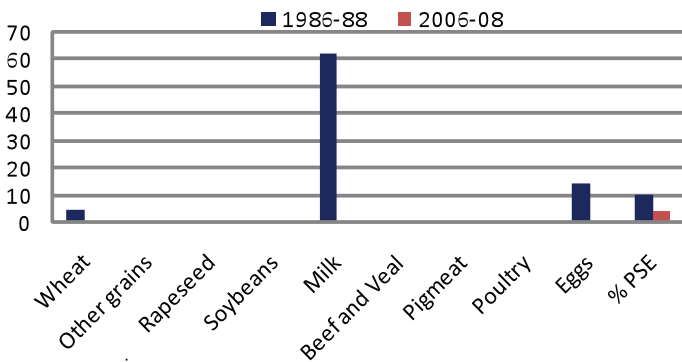


Figure 5b. Australia: Producer Single Commodity Transfer. Source: OECD PSE/CSE Database 2010.

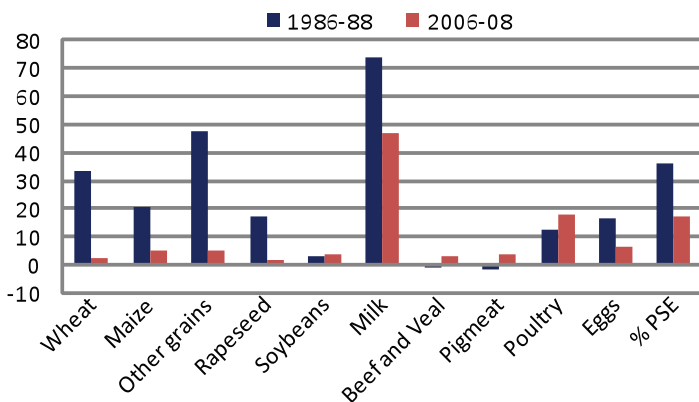


Figure 5c. Canada: Producer Single Commodity Transfer. Source: OECD PSE/CSE Database 2010.

Future Policy

In nearly all cases considered for this paper, a disconnect became evident between policy goals and political actions. In other words, the political system does not allow the true wishes of voters (or, for that matter, of bureaucrats and politicians) to be enacted. Of the many reasons, a key cause is the fact that agricultural policies in almost all countries are a product of the past. (For example, the crisis in the Great Depression was in part a result of US farm subsidies. In a way, not much has changed since then.) Once policies are in place, a status quo bias takes effect that is extremely difficult to remove or change.

So when we consider future policy developments in each country, there is much debate on significant reforms and a new approach due to modern circumstances, yet this does not mean it will actually be carried out in full. One reason is that there are enforcement and commitment problems for promises

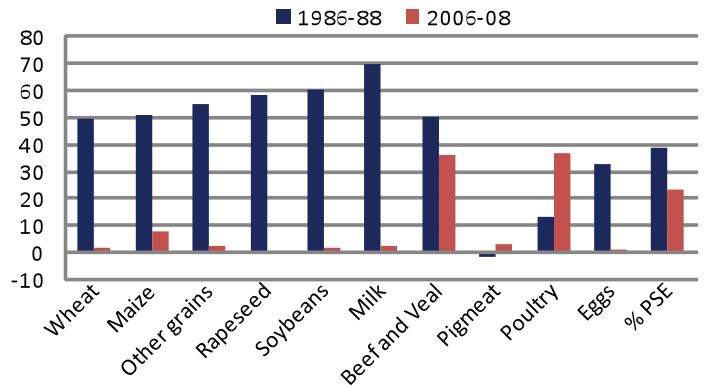


Figure 5d. Europe: Producer Single Commodity Transfer. Source: OECD PSE/CSE Database 2010.

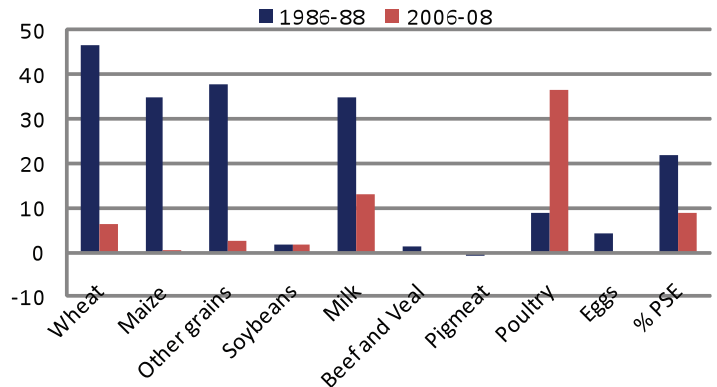


Figure 5e. US: Producer Single Commodity Transfer. Source: OECD PSE/CSE Database 2010.

of policies by politicians, and of voting by individuals. Political trades between various individuals and groups are inter-temporal, and need to rely on non-enforceable contracts and promises by “the state.” The allocation of political power creates an inherent commitment problem, undermining the potential to reach efficient outcomes because politicians (incumbent or rival) cannot make commitments to bind their future actions. Voters cannot commit to politicians in the future, because they no longer possess the political power to enforce such promises. And politicians cannot commit today to future policies, since they will be determined by whoever has power in the future. A classic example was the 1996 US Farm Bill, in which decoupled payments were introduced and were to be phased out over seven years. But within two years, politicians reneged.

Another reason for this phenomenon involves communication issues between various participants in the political process. Politicians and lobby groups intentionally do not fully inform voters. Because of incomplete and asymmetric information, politicians have the incentive to obfuscate. Although benefits are concentrated and costs disperse, there are also external effects whereby perceived benefits spread to other voters. A classic example is the rhetoric over the justification of US ethanol policy: reduce dependence on oil; on oil from Middle East or on oil imports in general to enhance “national security”; diversify energy sources (and types); reduce local pollution, mitigate global warming, reduce tax costs of farm subsidy programs; increase farm incomes; and accelerate rural development. Obfuscation of information increases re-election chances by increasing costs of program evaluation.

The discussion below of future policy goals and political pressure for change will be muted significantly by the realities of the political process just described. Therefore the economic rationale for observed political pressure to change policy will inevitably be overruled to some extent by the political rationale for actual policy outcomes.

Next, this paper analyzes future policies for each country in alphabetical order.

Australia

Australia bundled its agricultural policy reform with its overall economic strategy. All import tariffs, including those on manufacturing goods, were liberalized along with the deregulation of the service sectors. This benefited the agri-food sector directly (with low-cost, high-quality capital goods used as inputs in agricultural production) and indirectly (import taxes are a tax on exports because the former divert scarce resources to the import-competing sector). There are additional backward linkages to domestically produced intermediate inputs, as the additional income earned from free trade leads to a multiplier effect on increased consumption and investment.⁴

But there were other advantages as productivity increased with the transfer of foreign technologies. Increased competition stimulated industries to become more efficient, while less productive firms were forced out of business and more productive firms were allowed to expand. Trade caused as much resource reallocation across firms within an industry as across industries. The previous trade-distorting support failed to increase the incomes of farmers, as additional revenues were sequestered by higher production costs. Meanwhile, farm household income did not increase significantly because labor and capital that may have been put to more productive uses (both in on-farm and off-farm investments) were kept in production activities, yielding only a marginal increase in profits. Input and marketing costs increased as a result, allowing upstream and downstream industries to capture a share of the subsidy as well. The elimination of trade-distorting support provided incentives for greater efficiency, and spurred productivity growth as farmers and other firms in the agri-food value chain adjusted product mix and land use, and lowered the use of inputs. These efforts spurred productivity growth.

The primary goal of the Australian Department of Agriculture, Fisheries and Forestry is to facilitate the development of self-reliant, profitable, competitive and sustainable Australian farm businesses and industries.⁵ The current national policy focuses on several areas, including R&D expenditures for innovative approaches to reducing greenhouse gases, better management of soils and adapting and

adjusting to climate change. This will also require the continued implementation of water policy reforms with market-based solutions and efforts to conserve natural resources.

The state governments have undertaken various innovative agricultural policy initiatives and strategies. South Australia and Victoria, for example, have focused on sustainable value chains. For example, South Australia’s “Food Strategy 2010-2015” sets out a vision for “Food – beyond the expectations of consumers around the globe.”⁶ The strategy was centered around the notion of the whole food value chain. It starts with consumers, in an effort to understand and deliver the products they want, and works back through retail, distribution, processing, and eventually the agricultural producer.

The goal is to move away from traditional supply chains that simply push products through to consumers (see top panel of Figure 6). As the second panel demonstrates, if one does not understand the market, then it is like hammering a square peg into a round hole. A better solution is to change the shape of the peg, or change the hole. This means reshaping the product or targeting a different market. This is the value-chain approach in the third panel

of Figure 6, where it is the consumer that pulls a product via demand. The primary difference between a supply chain and a value chain is a fundamental shift in focus from the supply base and producers to the customer base and consumers. Notably, value-chain management requires inter-organizational coordination to reduce costs, add value, and save time. But improvements to chain performance do not automatically benefit the chain as a whole. A distinction should be made between value creation, and value capture, with both types of values to be exploited.

This strategy recognizes the increasing international market integration (among producers and exporters, food processors, and supermarkets) that comes with globalization. It also acknowledges the evolution of modern value chains, characterized by increased trade in high-value products and the dominance of large multinational food companies. The quality and safety standards for food have become more onerous thanks to tightening public and private standards on marketing, labelling, food contamination, general hygiene, and traceability. Private standards established by large food companies and supermarket chains often go beyond food quality and safety specifications, coming to

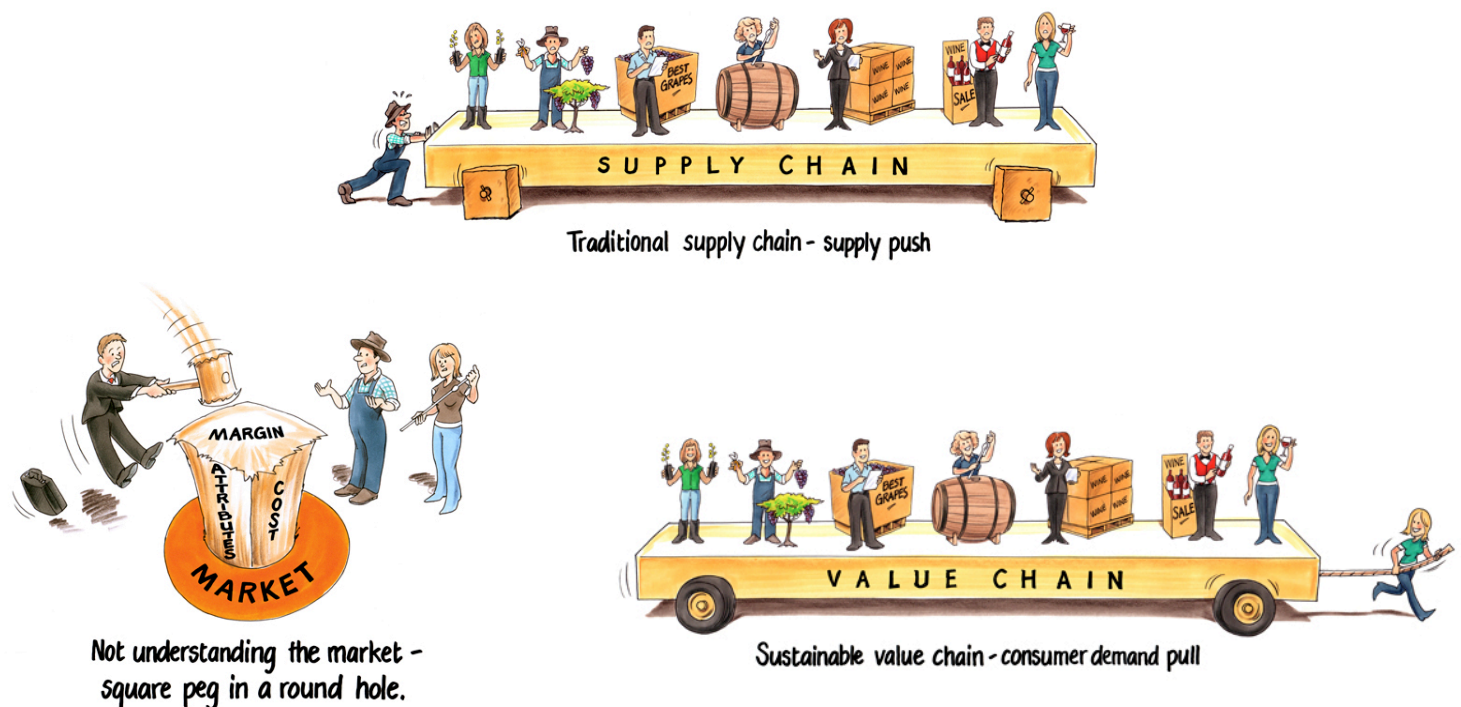


Figure 6. Value Chain Strategy of South Australia.

also encompass ethical and environmental concerns. As a consequence, global food trade is increasingly organized around vertically coordinated supply chains. These structural changes are profoundly altering the way food is produced and traded, and South Australia has embraced a strategy to take advantage of these developments.

By reforming trade-distorting agricultural support, Australia has recognized that comparative advantage is a necessary (though insufficient on its own) condition for success. One also needs a competitive advantage focused on global value chains, which are defined as institutional arrangements linking producers, processors, marketers, and distributors. Competitiveness first requires that a cluster of industries are created, after which the sector becomes successful. Such a cluster emerges when: inputs are available, affordable, and of high quality; the motivation exists to continually improve quality and service; firms in related industries are willing to provide various inputs; and strong competition exists among domestic firms, creating incentives for continual improvement.

To realize a sector's true competitive advantage requires a more holistic policy approach, one that considers physical, institutional, infrastructural, and policy constraints. The strategy in South Australia has been developed with extensive industry and government consultations, and is based on six priority areas:

1. Developing consumer insight and markets – helping industry understand and capture opportunities in a wide variety of markets;
2. Enhancing knowledge, collaboration and leadership – equipping the sector with the technical skills and business knowledge to collaborate and manage change;
3. Enhancing capacity, productivity, and efficiency – ensuring industry operates in a cost-competitive business environment and is improving its productivity to encourage investment;
4. Optimizing environmental sustainability – fostering sustainable management of limited natural resources, optimizing water, waste, energy, and carbon;

5. Leading in food integrity and security – providing safe, secure, and nutritious food to enhance consumer confidence;
6. Fostering regional and community development.

The Victoria state government released its Future Farming Strategy in 2008, establishing a vision of a more productive, competitive, and sustainable sector.⁷ The strategy will cost \$205 million over four years and will deliver tailored and targeted services to meet the needs of farm businesses and to match industry needs. One of the strategy's action areas is: "developing new products and securing new markets." This will require industry value chains to be more productive and competitive in order to capture market opportunities. Investments in sustainable value-chain development activities are subject to standard beneficiaries/funders tests. One public/industry initiative currently underway is a substantial value-chain analysis and development project in the lamb industry (a priority sector). The government's service delivery principles (for services targeting both farmers and value chain participants) are:

- ❑ targeting services to achieve the greatest benefit for Victoria ;
- ❑ focusing funding on areas of public benefit with industry funding supporting industry benefit;
- ❑ considering who is best placed (efficiency and effectiveness) to deliver services;
- ❑ not competing with effective private providers or community groups;
- ❑ expanding the capability of staff and the service provider sector as a whole.

Other action areas include boosting productivity through new technologies and changes in farming practices, education, and climate change management, and strengthening land and water management.

It is clear that state governments in Australia are taking the lead in this effort.

Growth in high-value agri-food exports can bring about more employment in agro-industrial firms. It can also create more employment in post-harvest

processing and handling of high-value products. The resulting increase in high-value trade can bring about positive effects for rural development, even with stringent standards, and with consolidation and vertical coordination in supply chains. The strategy is a long-term vision, one that recognizes that the agri-food industry has become more concentrated, integrated, and competitive internationally.

Brazil

In Brazil, current policy interventions are quite modest, resulting in low levels of support. New commodity programs were introduced to support family farmers, while the volume of subsidized credit available to farmers continued to increase. Farm insurance programs were expanded to cover more crops, and the maximum compensation level per farmer also increased (OECD 2009).

For the rural sector, Brazilian policies are organized into two general policy frameworks, and split into two ministries: the Ministry of Agriculture and Livestock, which manages the policies for commercial farmers; and the Ministry of Agrarian Development, which manages programs for agrarian reform, land settlement projects and policies for family farming. Budgetary expenses with agrarian reform programs are notified as general services in the Green Box.

The Brazilian Ministry of Agriculture and Livestock has policy goals in five main categories (see especially Nassar and Ures 2009, but also Moreira 2009 and de Rezende Lopes *et al* 2009). Associated with these categories, the federal government of Brazil implemented specific agricultural policy strategies⁸:

1. Production, marketing, and investment credit for commercial farmers (motivated by high commercial interest rates in Brazil and risky agricultural production). Policies include: the provision of favorable conditions to access agricultural credit; requiring that a part of commercial bank deposits be reserved for rural credit; and providing preferential interest rates.
2. Income support programs for commercial and family farmers. Since 2004, the use of federal government purchases as a mechanism to

contribute to price stability with minimum and reference prices has been utilized in some specific seasons and for specific crops; mainly it is used for family farms. The policy has been shifted to promoting income support for family producers.

3. Rural development and family farming.
4. Debt management programs for commercial and family farmers.
5. Rural insurance for commercial farmers. Policies include insurance premium subsidies for agricultural loans (but the subsidy is very small in terms of production coverage and its availability to producers. The policy goal is to develop a comprehensive national insurance policy to reduce the risks associated with climate and diseases that negatively affect farm incomes (and so avoid future debt crisis).
6. Research expenditures to increase productivity that indirectly increases the competitiveness of Brazilian exports.

Brazil continues to pursue infrastructure investments and to make efforts to close the yield gap. While these initiatives are an important part of agricultural policy, private investments in each category are still a very large share of total investments. In essence, Brazil is following the supply-push model shown in Figure 7. This approach is logical given that its infrastructure is underfunded relative to developed countries (see Figure 8 for comparison of railroad infrastructure with the US). Furthermore, there is ample land available, with 210 million hectares of pasture alone (see Figure 9).⁹

Brazil has emerged as a major exporter of a wide range of crops (soybeans, sugar, coffee, orange juice, corn, and fruit) and livestock products (chicken, pork and beef). It is an emerging supplier that is rapidly becoming a major player on the world scene and has the potential to be an even larger player, with consequences for export competition and prices received by other exporters. Agriculture is important in terms of employment, accounting for 37% of all jobs in Brazil.

Brazilian agriculture has become highly competitive. In the 1960s and 1970s, the country constructed policies that were capable of converting poor soil

into highly productive areas. This transformation was facilitated by the use of modern varieties, the development of agricultural practices suitable to tropical conditions, stimuli for the development of several input industries (fertilizers, machinery, tractors, and combines, agrochemicals) and the creation of a national research system. In other words, thanks to technological development and an institutional environment that promoted investment, Brazil's geography, climate, and natural resources were transformed into an agricultural production powerhouse.

Until the mid 1980s, the Center-West, a region with typical vegetation known as "cerrado," was considered unsuitable for modern agricultural production. This region now is the most dynamic in terms of growth in the production of agricultural products. Brazil is a leading exporter in orange, soybeans, sugar, beef, pork, chicken, and coffee, with an average annual growth rate exceeding 14%. The areas harvested with wheat, soybeans, and corn in Brazil is less than half of that in the US, but the growth rate is almost eight times as high.

The second Brazilian ministry of agriculture, called the Ministry of Agrarian Development, exists because about 60% of the food consumed in Brazil and almost 40% of the gross value of agricultural output is produced by small-scale family-managed farms.¹⁰ Some 4.1 million family farms (85% of the total number of holdings) occupy about 30% of the



Figure 7. Brazil as an Example of Traditional Supply Push. Source. ICONE (Institute for International Agricultural Trade Negotiations), Sao Paulo.

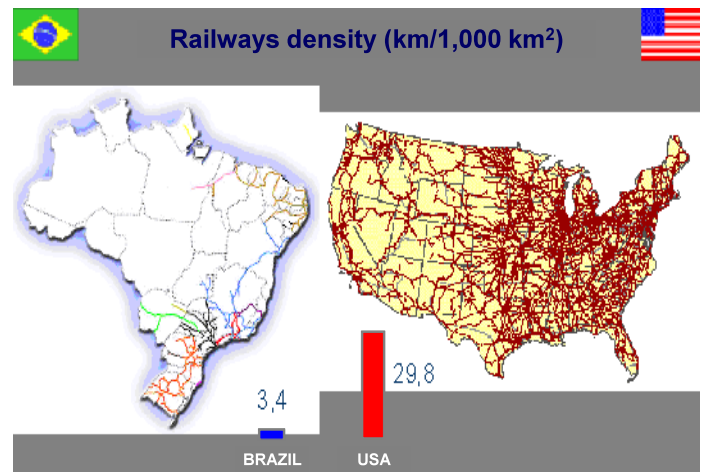


Figure 8. Railway Systems: US vs Brazil. Source. ICONE (Institute for International Agricultural Trade Negotiations), Sao Paulo.

	Area	
	Million ha	%
Amazon Forest	360	42%
Pasture	210	25%
Yearly crops	49	6%
Perennial crops	15	2%
Cultivated forests	6	1%
Non exploited	101	12%
Cities	20	2%
Protect areas	52	6%
Others	38	4%
Total	851	100%

Sources: IBGE and Conab _ Adaptation: MAPA



Ministry of Agriculture, Livestock and Food Supply

Figure 9. Land Use in Brazil. Source. Brazilian Institute for Geography and Statistics.

cultivated area in the country. The family farming sub-sector is characterized by its diversity in terms of the wide range of products it generates, as well as the typical farm size: some 20% of the family-managed farms – those most fully integrated with the market – account for around 71% of the sub-sector's output; a further 35% generate about 20% of the output, while the remaining 45% contribute only 9%. Rural poverty is heavily concentrated in this last category, which is also vulnerable to food insecurity. The Ministry of Agrarian Development focuses primarily on rural poverty and programs to provide technical assistance to small-holder agriculture.

China

China accounts for 21% of the world's total population. But it has only 10% of the world's arable land and only one quarter of the average world water resources per person (Anderson 2009d). It has a large agricultural sector, accounting for 18% of global agricultural production. This is substantially more than the traditional agricultural production and trade of the Europe Union, the United States, Brazil, and India (Anderson 2009d). And yet, China has historically played a relatively minor role in global agricultural trade. Given the substantial reforms undertaken in China's agricultural trade policies, this seems likely to change over time, with important implications for Canada.

China's agriculture is characterized by scarce land, abundant labor, and small-scale production that uses little mechanization. Due to its limited arable land and large rural labor force, China generally tends to have a comparative advantage in producing labor-intensive crops, such as fruits and vegetables, and a disadvantage in producing land-intensive crops, such as grains and oilseeds. However, the agricultural sector is strongly diversified regionally, and depends on the availability of land and water, climatic conditions, transportation costs and access to markets (Huang and Rozelle 2009c).

China's agricultural growth, though it has trailed overall economic growth, has been impressive. The average annual growth rate of the agricultural sector has been tracking at about three to five times that of population growth, with total productivity growth well above that of developed countries. Within the agricultural sector, considerable structural adjustments have also been observed as a result of changes in the pattern of food consumption and trade. From 1949 onward, China showed a positive trade balance (for most years) in agri-food products. In 2003, after nearly 30 years of reform and rapid growth, China became a slight net importer, and since then the trade balance has been negative. While the value of agri-food exports has recently increased, imports increased sharply in 2002, just after China's accession to the WTO. By 2006, agri-food imports totaled \$31 billion, compared with \$11.1 billion in 2002. This was a threefold increase. China

is now one of the top five importers and exporters of agricultural products.

Prior to its 2001 accession to the WTO, China increased the market orientation of its agricultural sector. But since then, its policies have been reversed, especially for grain markets, which have seen multiple government interventions. In May 2004, China allowed qualified firms to buy and sell grain on the open market, and largely liberalized grain prices on domestic markets. However, the government continues to regulate the grain market through national grain stocks, minimum purchase prices, state trading enterprises, tariff rate quotas management, export taxes, and changes in export VAT refunds for grains. In 2006, China engaged in large-scale intervention purchases that accounted for about 40% of total wheat production. Minimum prices for grains are closely linked with China's grain reserve system, which is responsible for: purchases of grains at market or minimum prices (when it is above market price), storage, delivery, processing, and import/export operations for the central grain reserves (Huang and Rozelle 2009b).

In addition, grain producers are benefiting from a growing range of budgetary transfers, such as direct payments and input subsidies. Direct payments were initiated as a trial in 2002, and implemented nationally in 2004, to support grain production and to increase grain producers' incomes.

In 2006, a centrally funded, comprehensive subsidy on agricultural inputs was introduced to compensate farmers for an increase in the prices of agricultural inputs such as fertilizers, pesticides, plastic films, and diesel. Figure 10 shows that this subsidy is becoming one of the most important budgetary transfers in support of agriculture. The targeted key beneficiaries of this subsidy are grain producers, as the amounts transferred to provinces depend on grain planting area.

In addition to the comprehensive input subsidy, China has a set of policy measures aimed at lowering the price of chemical fertilizers and increasing the domestic supply of these fertilizers. These measures include preferential prices for electricity and natural gas used by fertilizer producers.

In 2002, subsidies were introduced to support the sowing of improved quality seeds. The amounts transferred increased every year, and the subsidized area increased substantially. For example, for wheat, the area covered doubled from 6.7 million hectares in 2007 to 13.3 million hectares in 2008.

Compared with the OECD average, the level of support to agricultural producers nevertheless remains low overall. However, it has been increasing since 2000. Recent changes in China’s agricultural policy need to be seen within the context of broader policies affecting the rural population at large. These policies have been aimed at improving rural infrastructure and access to basic public services such as education, health care, and social security. The recent agricultural tax reform and further relaxation of labor markets work in tandem with these broader policies.

Recently, “Major Decisions on Key Issues of Promoting Rural Reform and Development” was issued (Oct. 12, 2008), setting the following major goals for China’s agricultural sector and rural development by 2020¹¹ (the first two being particularly relevant for Canada):

- ❑ Significant progress in agricultural modernization and productivity, and improvement in national grain security (improve productivity and government investment in grain producing areas, agricultural technology innovations; infrastructural investment);
- ❑ A doubling of farmers’ income and elimination of rural poverty;
- ❑ Perfecting of rural economic institutions and establishment of an integrated rural-urban system on economic and social development (e.g., rural financing and credit reform);
- ❑ Significant improvement in local governance, village leader election and farmers’ democracy;
- ❑ Largely equalized public goods and services provision between urban and rural and among regions;
- ❑ Establishment of a resource-saving and environmental friendly agricultural production system.

This document also stresses the importance of China’s agricultural FDI in the rest of the world and China’s role in the global agricultural economy.

On Dec. 31, 2009, China’s Central Committee of the Communist Party and the State Council released the annual “Document No. 1,” which outlines the government’s plans to address a range of rural issues in the upcoming year (FAS 2010). This document reaffirms China’s emphasis on increasing rural incomes. The document addresses several issues relevant to agriculture, including subsidies, rural financial services, stable development of cereal grains, agricultural technological innovation, and extension, wholesale markets, land administration (i.e., protecting farmland) and trade.

Public spending on agriculture at all levels of government is expected to grow at a higher rate than the growth rate of regular budget revenues, with an eye to improving the system of agricultural subsidies. An “improved variety subsidy” for wheat will increase, and one has been initiated for barley.

China is expected to increase agricultural machinery subsidies, and to expand the types of machinery eligible for subsidies. The new increases in subsidies should favor large grain farmers. More efforts are needed to optimize the variety mix, increase the yield and improve the quality. The government has

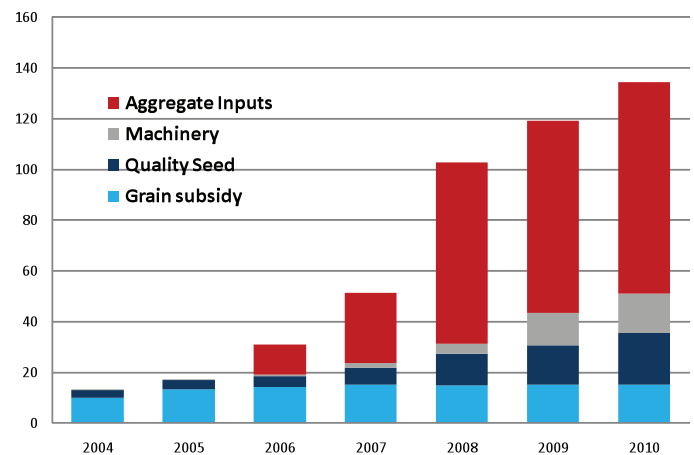


Figure 10. Agricultural Subsidies in China (in Billion Yuan). Source: China Ministry of Finance Data from the Report of the Central and Local Government Budgets Implementation and Draft Budgets.

formulated a plan to build production capacity for an additional 50 billion kilograms of grain scheduled, with production to begin as soon as possible. The government is also expected to bring in an increased fiscal reward for major grain-producing counties, and is expected to support policies that will lean toward farms that provide large quantities of commercial grains.

Finally, China is expected to increase its capacity in agricultural technological innovation and extension, with an emphasis on breeding genetically modified varieties and the development of functional genes. High applied values and intellectual property rights are expected to speed up the creation of a good variety extension system. China is also intent on becoming a leader in biotechnology. It has committed \$300 million per year to this pursuit, with the goal of being a biotechnology leader. This investment is more than all of the developed countries combined (for background, see also Hu, Rozelle and Pray, 2005).

Meanwhile, China intends to promote mergers and acquisitions of domestic seed companies, and will encourage seed companies to merge with research institutes so as to foster large seed enterprises with core competitiveness. Leading talents in agricultural technology are to be cultivated and alliances among universities, research institutes, and enterprises will be developed.

The future of China's agricultural policy is centered on increasing productivity, with a bias toward grain production, where it does not yet have a comparative advantage. However, recent pronouncements include a 95% decline in the reduced self-sufficiency ratio for food grains. Meanwhile, trade distorting subsidies seem to be trending more toward import-competing crops like wheat.

The European Union

The EU is currently going through an intense public debate on the future of the Common Agricultural Policy (CAP). Many investigations are being conducted on how the CAP will look after 2013.¹² The context is the upcoming budget negotiations and the so-called new objectives of: 1) improving the quality

and guaranteeing the safety of food; 2) ensuring the well-being of rural society; 3) supporting the multifunctional role of farmers as suppliers of public goods to society and protecting the environment; 4) providing better conditions for animal health and welfare. These new objectives are reflected in Pillar II priorities and cross-compliance regulations that farms have to satisfy in order to receive the payments (EU 2005; 2006). In this process, the CAP has also moved to emphasize market orientation, competitiveness and the fair allocation of support. With a budget of €52 billion (of which €37 billion is in the form of direct farm payments), much is at stake when considering changes to the CAP. One influential academic report¹³ carefully assesses how the new objectives can be best attained: by reforming the current subsidy system to a three-stage contractual scheme that includes "basic husbandry payments," "natural handicap payments" and "green points payments." The latter would replace the current single farm payments, and would offer "decoupled payments subject to few but observable commitments regarding rural farming landscape, biodiversity, and natural resources" while being substantially lower than the current subsidies. After a wide-ranging debate, the Commission presented a communique in November 2010 called "The CAP towards 2020." It outlines options for the future CAP and launches the debate with other institutions and with stakeholders. The presentation of legal proposals is foreseen for 2011. [http://ec.europa.ca/agriculture/cap-post-2013/index_eh.htm].

The EU has adapted the sustainable food value chain approach to policy, if only in an ad hoc way; concerns over food safety, food quality, animal welfare, and sustainability require consideration of all aspects of the food production chain. This affects many economic dimensions, with policy facilitating the interaction between different levels in the vertical chain while strengthening the ability of farmers to create alliances with other actors, and thereby improve competitiveness and rural development. Previously, the food chain concept had been applied by the private sector to optimize chain organization and create value along the chain.

The Netherlands

The Netherlands has an export-oriented, capital-intensive agriculture, and food industry. The value-added benefit of the industry is €40 billion, of which €7.5 billion is realized at the farm level. The Netherlands is not heavily dependent on the CAP, with milk, sugar, and starch potatoes being the most heavily protected. Seed and ware potatoes, and flowers and vegetables – produced both outdoors as well as in glass houses – and intensive livestock are basically unsubsidized. All sectors are dominated by traditional family farms, but glass house horticulture has large and dynamic farms. Arable farms, as well as mixed farms and grassland farms, are relatively small.¹⁴

In The Netherlands, public and private investment in R&D is relatively high, compared with other countries. Total public investments in the knowledge system are nearly €900 million, representing almost 40% of the total budget of the Ministry of Agriculture. It is equivalent to 4% of the production value of primary agriculture. R&D expenditures are almost six times that of Canada on a per unit agricultural GDP basis.

Adopting a free trade stance has created technological advantages for Dutch agriculture. Innovations are being embedded in goods, international networks are being developed, and domestic industries are being pressured to adopt new ideas.

In the past 25 years, the system for education, extension and research – which is the fundamental policy instrument – has been reorganized substantially. This reorganization occurred in response to challenges from; globalization, industrialization, reform of agricultural policy, animal diseases, and food safety crises, ongoing environmental issues, discussions on animal welfare, and the restructuring of farming and high off-farm employment. The Dutch have moved from focusing on the modernization process to trying to solve the negative environmental externalities associated with intensive agricultural production.

The modifications of agriculture policy have included privatization of the Extension Service, merging of

institutes for applied research, and introducing an output tax to finance research. The modifications have resulted in a decline in the influence of commodity boards, and the introduction of a public-private innovation program focused on making the transition to sustainable agriculture.

This resulted in moving away from the linear model of innovation to a more complex agro-innovation system. Table 2 summarizes several driving forces that contributed to this transition, including the food chain, the rising prominence of negative externalities, and the rise of multinational food companies. Ideas from the so-called New Public Management School – including benchmarking, output financed, and more independence from policy – have been the cornerstone of change. In moving to a sustainable agriculture with structural adjustment and the need for innovative breakthroughs, the Ministry of Agriculture created foundations that have research programs which act as agents of change. One of them is the Innovation Network, which tries to come up with mind-challenging new concepts for agriculture. By dedicating more research to issues in other levels of the food chain, these initiatives are consistent with new EU policy aims.

The research projects of the Ministry of Agriculture are indications of an innovative way of thinking, with titles like “Competitiveness monitor for pork,” “Improving dairy chain sustainability by reducing concentrates footprint,” “Chain Risk Model for quantifying cost effectiveness of phyto-sanitary measures,” “Integrated Digital Horticulture Inventory, analysis, and program proposal,” “Creating green consumer loyalty,” and “How to strategically market CSR and obtain consumer preference.”

Slovakia

Slovakia, as with other Eastern European countries, has a comparative advantage in agricultural production. However, the country did not experience a huge increase in agricultural exports to the EU after accession, to the surprise of expert economists. This was primarily because of the complexities of food safety regulations and product quality considerations.¹⁵ There were too many small farmers and processors in Slovakia that could not meet

Table 2: Driving forces for institutional changes in the organization of extension and research in Dutch agriculture

Driving force	From...	To...
Consumer demand	Production of basic food	Value added by food chain
Public interest	Modernization of farming	Coping with externalities, supply management and 'consumer concerns' (like landscape and animal welfare)
Labor market	Hidden unemployment in farming, low education and local labor market	Regional, metropolitan labor markets with shortages and well educated farmers
Farm households	Weak integration in markets	Heavily integrated, often non-farm income spouse
Farm business	Lack of (access to) capital	Capital intense, high land prices (collateral), well integrated in credit market
Organization of food chain	Small local cooperatives	Large (cooperatives) multinationals

strict EU standards. In some cases, farmers were not eligible for payments because of environmental cross-compliance restrictions.¹⁶ The composition of exports to the EU15 has been stable, suggesting that Slovak consumer-oriented exports have been unable to penetrate selective EU15 market. Slovakia succeeded in filling some niche markets, such as dairy products. Meanwhile, imports increased even more than exports, and were dominated by consumer-oriented products. This illustrates the importance of competitive advantages.”

Slovakia’s inability to increase exports to the EU15 after 2004 may also be attributed to the fact that when other countries acceded to the EU, their agricultural trade was already liberalized, thanks to the acceded “double profit“ and “double zero“ agreements (Drabik, Pokrivcak and Ciaian 2007). These agreements eliminated tariffs on agri-food commodities and created duty-free quotas for others. The double zero agreement (also known as the “zero-for-zero agreement”), effective since 2001, provided duty-free quotas for pork and poultry trade and duty free trade on a number of other goods. The double zero agreement excluded goods in whose markets the EU intervened (grains, dairy, sugar, beef). However, the double profit agreements opened duty-free quotas for wheat, corn, beef, and dairy products, and allowed for (nearly) free trade in fruits and vegetables.

Another aspect was non-tariff barriers, which were completely (and formally) abolished after

May 1, 2004 (Drabik and Bartova 2009). A gradual preparation for Slovakia’s accession to the EU was made via accession agreements within the Acquis communautaire. Gradual adoption of 31 chapters of the European law in the process of enlargement was another factor in mutual Slovakia-EU15 trade. The need to meet strict EU sanitary, phytosanitary, and animal welfare regulations required substantial investments on the part of Slovakian farms and processing companies. These pressures have already led to investments and concentration in the processing sectors of Slovakia. After the EU accession, Slovakia experienced a significant increase in imports of agricultural commodities from the EU15.

In Slovakia, the Common Agricultural Policy (CAP) of the EU is now applied and there is no independent Slovakian agricultural policy per se.¹⁷ There are some specifics in application of CAP in Slovakia, however, such as additional subsidies for land and per head for cows and sheep (to be terminated once Slovakia reaches 100% of direct payments from the EU budget). Subsidies are also given to insurance and some public goods, such as measuring yields, gene pool, and some breeds of horses.

The objectives of Slovak agricultural policy are now based on EU objectives. The government specifically states the following primary objective: sustainable development of productive agriculture using resources efficiently throughout Slovakia. Other objectives include food safety, competitiveness, contribution to rural development, and production of safe and high quality products. There are also specifics with respect to the second pillar of the CAP (rural development), in which each country chooses its own support (given the general EU framework).

United States

The US is in the midst of a debate over the 2012 Farm Bill, with cross-country hearings underway.¹⁸ Prospects for reform through WTO negotiations – the combination of environmental and taxpayer interests that would shift agricultural support toward public-good provision, or from the resurrection of a general disposition to economic liberalism – have fizzled. The three post-Uruguay Round farm bills show these

pressures were a weak reed upon which to rest prospects for reform (Orden, Blandford and Josling 2009). If anything, the US has gone backwards since the Uruguay Round, as farm lobbies have turned their back on international trade and are now relying more on biofuels, import protection and farm subsidies.

Since the Uruguay Round, the US eliminated the target price/deficiency payment scheme in the 1996 Farm Bill and replaced it with direct payments that have continued indefinitely (they were to have been discontinued in 2002). Meanwhile, a new program introduced counter-cyclical payments (CCPs), which are conditional on market prices but not on what is produced. The loan deficiency payment (LDP) scheme was continued, and before the biofuels boom it was costing more as commodity prices continued their secular decline in nominal terms (while the loan rates were unchanged or, in some cases, even increased in recent years). On top of all this, the US government allowed updating of base acres and payment yields in the 2002 Farm Bill, in clear violation of the Agreement on Agriculture's definition of decoupling. In the Cotton Case, Brazil was able to prove decoupled payments were coupled but used other (more difficult) reasons. Meanwhile, in addition to increasing coupled support prices, the US added new crops to both coupled and decoupled subsidy programs (e.g., soybeans and pulse crops), while land restrictions on fruits and vegetables continued. Over the past two years, taxpayer costs of farm support for crops have been about \$13 billion for crop insurance (of which farmers only received \$6 billion)¹⁹ and \$10 billion for direct payments. It is not clear what ACRE (with a 13% sign-up) and SURE will cost this year, but LDPs and CCPs will be close to zero again as market prices are holding up with the biofuels boom. The US seemingly has multiple crop subsidy programs, most of which are countercyclical and include the traditional programs (LDPs and CCPs) that can kick in year after year. By contrast, crop insurance and disaster payments are usually one-year events (with ACRE duplicating and overlapping to some extent the crop insurance and disaster payment programs). SURE is a complicated program that ensures farmers are not overpaid for crop losses. The introduction of ACRE and SURE reflected the recognition that the crop insurance program is not cost effective. The US is unique in this

regard, as most other countries have a more stable direct payment program (e.g., the EU or Canada, which has a revenue insurance program with more emphasis on whole farm income criteria). Politically, it seems nearly impossible to move away from this approach in the US. There are even calls for more "revenue insurance" type schemes (as there were in previous Farm Bill debates, although these never materialized).

While the suite of crop subsidies inevitably leads to increased production and a reduced world price for crops, there are about 35 million acres of cropland in the \$2 billion annual Conservation Reserve Program. This reduces supplies, and partially or even fully offsets the price-depressing effects of subsidies. Various other conservation programs in the US cost another \$2 billion. These programs help reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat and reduce damages caused by floods and other natural disasters. The public benefits of these programs include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation and scenic beauty.

Initiatives to combat low milk prices constitute another US policy area of interest to Canada. US discussions are underway to control the flow of milk in a similar way to the marketing controls introduced in the sugar market in the past decade (hinting at supply management). There is also talk of reintroducing product price supports and bringing in a voluntary buyout. In addition to import tariff quotas and price discrimination between dairy product categories (with pooled pricing), the US maintains a production subsidy program for milk called MILC. But, it is limited to 3 million pounds of milk per producer, and industry considers it inadequate. The US also has many policy initiatives on food safety and quality. Policies like COOL can be viewed either as a food safety measure or a technical barrier to trade.

US agriculture has relied on biofuels policies to increase farm prices, although to the detriment of crop users who may easily offset any employment gains from biofuels production in rural areas. The

primary objectives of US biofuels policy were to reduce dependence on oil (especially imports of oil) and local air pollution. In the intervening years, the agriculture lobby seized upon the benefits of ethanol for reducing tax costs of farm subsidy programs and promoting rural development. In the EU, the primary motivation for biofuels was combating global warming, a motivation that has come to the US only recently.

The US has also seen policy developments with regard to cap and trade initiatives, as land and land-use policies have become central to global climate change mitigation efforts. Recent US cap-and-trade legislation passed by the House (but not the Senate) includes 41 pages on carbon offsets.²⁰ Energy-intensive industries in the regulated cap-and-trade sector can purchase offsets from the unregulated agriculture and forestry sectors, instead of having to purchase permits on the open market. One billion tonnes of carbon offsets were penciled into the legislation. With carbon prices expected to be around \$20 per tonne, revenues to agri-forestry sectors could be as high as \$20 billion per year. It remains to be seen whether one billion tons of carbon can be offset. Mitigating factors include the costs of implementing, monitoring and verifying real, additional, and permanent GHG emission reductions, and uncertainty regarding how much the agri-forestry sectors can technically contribute.

The potential for carbon sequestration comes through: changes in manure management and fertilizer application; various crop management practices; and conservation programs with reforestation and afforestation (see Table 3 for more details). As with biofuels, affect commodity prices could be impacted, as land can be diverted to carbon sequestration projects under the carbon offset program.

Furthermore, the legislation allows for “green tariffs” and “producer rebates” to counter carbon leakage through trade with countries without a cap and trade scheme. A recent analysis by a team at MIT showed that agriculture will likely have one of the highest weighted average carbon tariffs in a cap and trade system (Winchester, Paltsev, and Reilly 2010). Therefore biofuels and cap and trade legislation may

have significant effects on agriculture in future years, through instruments such as “carbon tariffs,” “carbon offsets,” and “producer rebates” [a subsidy through free permits].

Developing countries can also take advantage of carbon offsets by contributing to the mitigation of global climate change through changes in land use and agricultural production processes. Under the Kyoto Protocol, developing countries can voluntarily participate in climate change mitigation through the Clean Development Mechanism (CDM). Under the CDM, industrialized countries buy emission reduction credits from projects in developing countries to meet their own commitment.

Policy Goals Compared

All of these countries have a set of far-ranging and diverse policy goals. However, many fall short because of half-hearted efforts. In the EU, for example, the CAP originally aimed for productivity improvement, “fair” standard of living for farmers, stability and assured supplies at “reasonable prices.” But these goals were inherently conflicting, inconsistent, and camouflaged the true policy objective, which was protectionism and higher prices for farmers.

Today, all of these countries have to deal with the same set of issues, including farm incomes, the preservation of natural resources and the environment, climate change, biofuel policies, food safety, public investments in new technologies and R&D, rural development, and rural poverty, and food security. Each country has its own emphasis on each of these goals. For example, Brazil and China are genuinely concerned about the capacity of poor rural households and urban populations to obtain sufficient food at affordable prices. China has explicit self-sufficiency goals (which are now being reduced). The US, on the other hand, uses food stamps as a policy mechanism, while other countries leave food security to other government agencies (e.g., general welfare programs).

Another key issues these countries must face is the type of agricultural production system they favour.

Table 3: Sources of Important Agricultural and Forestry CO₂ “Reduction” Opportunities with Carbon Offsets or “Green” Payments. Source: UNFCCC Secretariat. (2008). “Challenges and opportunities for mitigation in the agricultural sector.” Technical paper (FCCC/TP/2008/8).

Emissions Reductions

Agricultural CH₄ Emissions Reductions

- Manure Management
- Enteric Fermentation

Agricultural N₂O Emissions Reductions

- Fertilizer Practices
- Manure Management

Biological Sequestration Fluxes

Agricultural CO₂ in Soils

- Tillage, Crop Rotations, Cover Crops, Grazing Practices
- Forestry CO₂ in Forests and Wood Products
- Afforestation, Reforestation, Deforestation, Avoided Deforestation, Forest Management, Wood Products

Avoided Fossil Fuel Emissions

Emissions Avoided from Substitution for Fossil Fuel

Combustion

- Liquid Transportation Biofuels (ethanol, biodiesel, other renewable fuels)
- Renewable Electrical Power (biogas, wood, grasses, other cellulose)
- Thermal Biopower/Bioheat (biogas, wood, grasses, other cellulose)

Emissions Avoided from Efficiency Improvements

Agricultural and Forestry Operations Efficiency for Fuels and Electricity

For example, Australia’s agriculture is land-extensive and subject to low and variable rainfall, making it vulnerable to climate change. The emphasis has therefore been more on adaptation to climate change, while the EU and US exploit both mitigation and adaptation to enhance farm income or promote rural development. Australia also puts more emphasis on managing invasive species and drought, and pays for these problems through producer levies.

Another issue influencing policy goals is export dependence. The importance of exports to the agri-food sector is given in Tables 4 and 5. Although

Canadian exports were valued at \$39 billion in 2008, that was only 30% of the US’s value of agri-food exports. Yet Canada is nonetheless the world’s fourth-largest agri-food exporter, after the US, the EU27, and Brazil.

The export volumes in Table 4 represent primary products such as wheat and canola, as well as processed products such as canola oil, baked goods, and livestock products. Primary exports by Canada were \$21.2 billion in 2008, equal to approximately 50% of the value of farm production.²¹ This does not mean that half of farm products are exported, as the per-unit value of primary products exports will be higher than the farm value due to the services provided beyond the farm gate. Canada exports another \$17.7 billion in processed food products, resulting in a total export value that is 93% of the value of farm-level production.

Using the value of agri-food exports in relation to the farm value of production as a measure of agri-food export intensity, the Canadian agri-food sector exports a larger share of primary production than major OECD competitors such as the US and the EU-27. Three southern hemisphere countries have higher export intensities than Canada. Argentina’s value of agri-food exports, as reported in Table 5, is 288% of the value of farm level production. New Zealand is next at 123% and Chile third at 98%.²² Canada is fourth on this export intensity measure at 85%, and the sector has a higher share of exportable production than other major exporters, such as the US (at 30%) and Brazil (at 43%). Australia, in contrast to Canada, has a lower overall agri-food export volume, and exports a smaller share of its farm level production.

The importance of agri-food exports to the agri-food sector in Canada and in other agri-food exporters is illustrated in Figure 12. While not as dependent on exports as Argentina, Canada’s agri-food sector relies on access to a variety of export markets for primary and processed agri-food products.

The data in Tables 4 and 5 above help explain why Australia and the US make increasing exports a policy priority. The Australian Department of Agriculture, Fisheries and Forestry has a “Trade and

Table 4. Value of Agri-Food Exports of Major Agri-Food Exporters

Country	Value of Exports		
	2007	2008	2009
	\$ (Cdn) billion		
US	100.9	128.1	116.9
EU-27	102.9	121.4	112.9
Brazil	47.5	61.7	62.0
Canada	31.5	38.9	35.2
China	29.2	32.2	32.9
Argentina	29.1	38.1	30.7
Australia	22.1	25.7	25.0
New Zealand	15.3	17.1	15.5
Ukraine	6.7	11.7	10.7
Chile	7.5	8.9	9.0

Market Access unit at the same level as “Agriculture and Food,” while the USDA’s third goal (of a total of four) is to “help America promote agricultural production and biotechnology exports.”²³

Biotechnology policy also varies. Australia, Brazil, China, and the US embrace it, though sometimes for different reasons. China wants to increase domestic food consumption and self-sufficiency, while Brazil tries to close the “yield gap.” The US and Australia are more concerned with export competitiveness and the viability of commercial agriculture, using biotechnology to expand agricultural exports. Over the past 20 years, concern over food safety for domestic consumers has consumed much of the EU

policy debate, while exports have been a secondary consideration.

All of these countries have adopted biofuel policies. But they have implemented them in different ways, and with differing results. Unlike the US and EU, Brazil’s policies do not subsidize or protect ethanol production (see Kliauga *et al* 2010). But any benefits for Brazil from EU and US tax credits and mandates are offset by import tariffs. Canada, on the other hand, has quietly switched its policy from exacting a tax exemption at the fuel pump to instituting a producer tax credit. This allows biofuel producers to benefit not only from the domestic production subsidy but also from the US blender’s tax credit and EU mandates and tax exemptions (100% of Canada’s biodiesel was exported through the US to EU, triple-dipping from subsidies in all three jurisdictions (Gorter *et al* 2009). Meanwhile, China has allowed only limited biofuel production from food crops because of food security concerns.

Natural resource and environment policies also differ. Although the US and Australia have more fragile ecosystems than the EU, the emphasis is more on reducing negative externalities. The US has payments for environmental services to reduce the negative externalities of agricultural production while serving as a means to transfer public funds to farmers. It should be noted that the US has active environmental programs. It is a myth that Europe is far ahead in that regard (see Figure 11). Similar policies are used in the EU, but with an additional objective of using

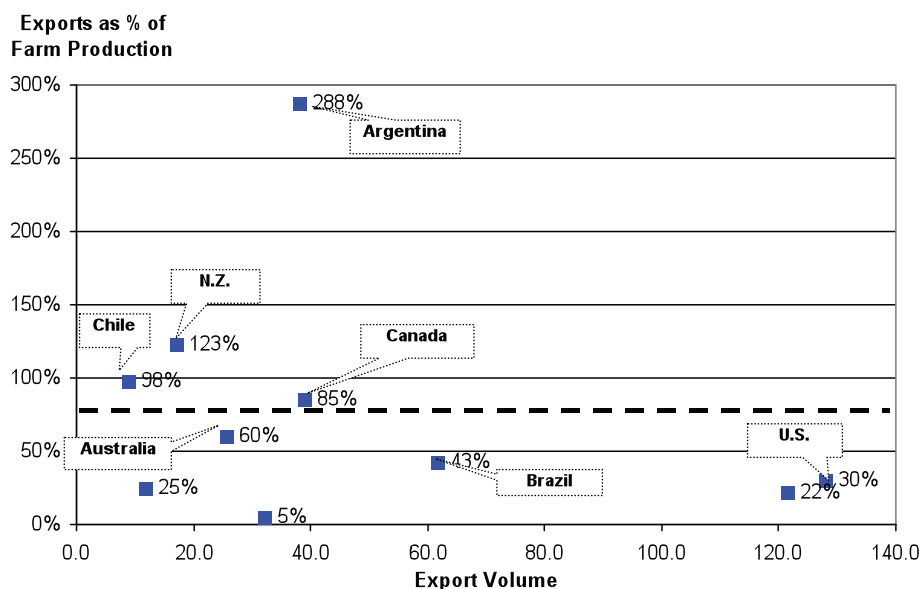


Figure 11. Relationship between Agri-Food Export Volume and Export Intensity of the Agri-Food Sector.

Table 5: Value of Agri-Food Exports in Relation to the Farm Value of Production of Major Agri-Food Exporters

Country	Value of Exports			Exports - % of farm production value	
	2007	2008	2009	2007	2008
	\$ (Cdn) billion			%	%
Argentina	29.1	38.1	30.7	288%	
New Zealand	15.3	17.1	15.5	123%	135%
Chile	7.5	8.9	9.0	98%	
Canada	31.5	38.9	35.2	85%	93%
Australia	22.1	25.7	25.0	60%	67%
Brazil	47.5	61.7	62.0	43%	
US	100.9	128.1	116.9	30%	38%
Ukraine	6.7	11.7	10.7	25%	
EU-27	102.9	121.4	112.9	22%	22%
China	29.2	32.2	32.9	5%	

agriculture as a driver for rural development. The EU emphasis is on compensating farmers for the private delivery of positive public goods, such as attractive landscapes, while the US focuses almost entirely on reducing negative externalities, such as soil erosion. US programs are also more targeted than in the EU, and take opportunity cost into account. The EU programs, on the other hand, address a wider range of externalities, and are focused more on paying for a particular farming process than reducing specific negative externalities. As a result, these programs are more easily used as a mechanism for transferring income to producers (Baylis *et al* 2008).

In Australia, farm incomes are supported almost exclusively through enabling the private sector, while managing true public goods (such as invasive species and droughts). The US and EU use direct payments and border controls as a means to enhance farm incomes. The EU is more constrained in changing these subsidies (border protection is constrained by WTO commitments) as the expansion to 27 member nations created more long-term policy planning cycles and greater difficulty reaching consensus. US politics, on the other hand, is becoming more and more polarized, making it difficult to constrain current and new subsidy programs.

Brazil and China focus on productivity improvement. Both have the dual goals of increased production and farm incomes. Brazil has dual ministries – one deals with small-holder agriculture and is really a rural development/food security/poverty program

that allows small farms to be viable, and the other makes large-scale agriculture world class through productivity improvements (e.g., close yield gaps in major field crops through research, etc.) and improvements in infrastructure (e.g., rail – see Figure 8). Subsidies and import tariffs are low all around and are not a clear policy priority.

China is also concerned about food/security/poverty. Since 1994, rural policies have been far more wide-ranging, focused on eliminating taxes at the village level while at the same time continuing rural-urban migration restrictions (although with continual modifications to take pressure off of rural wages). China is far more willing to use import barriers to protect import competing commodities, and is now increasing producer domestic support.

Implications for Canada

Of the countries compared in this report, Canada can best learn from Australia, and in three general respects. First, it can deregulate and eliminate trade-distorting support in the form of import protection, export subsidies and supply controls. This will reallocate resources at all levels of the agri-food chain and create efficiencies with a change in the input mix, firm size and lower input use. Spatial rationalization will also enhance productivity, and bring about an all around more efficient agri-food sector. Second, an emphasis on adapting to and mitigating climate change could prove rewarding.

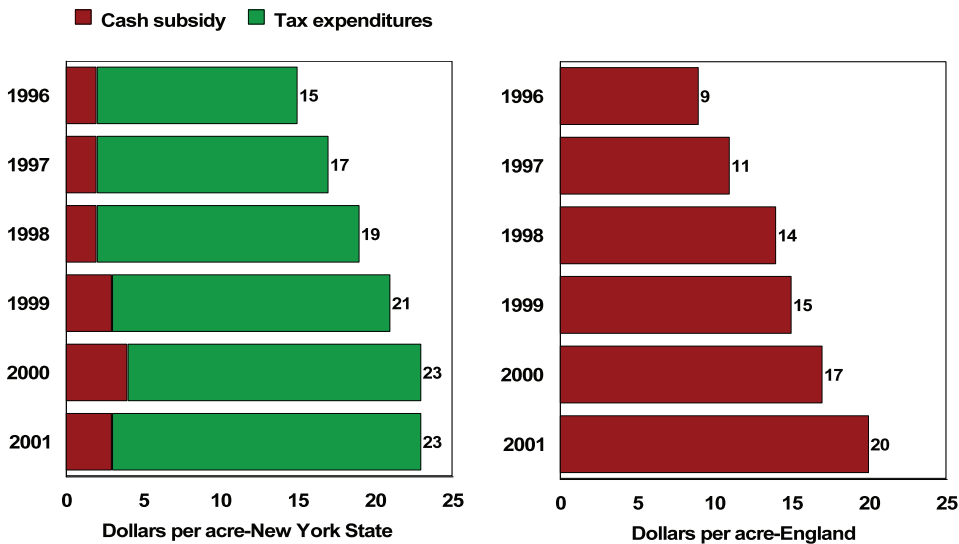


Table 12. Estimated Per-Acre State/National Agri-environmental Subsidies for New York and England, 2001-2006. Source: N. Bill and D. Gross. "Sustainable Multifunctional Agricultural Landscapes." *Land Use Policy*, June 2004.

Canada, unlike Australia, is expected to benefit from near-term climate change, and there is a potential to leverage gains from those changes. Third, an emphasis could be put on sustainable food value chains. Basic products like wheat, barley, and pulse crops will not see increased competition from Brazil and China, which do not have a comparative advantage in these commodities. Therefore, a continued emphasis on current export products is recommended. But these and many other products, especially import-competing products, can be supplemented with policies that emphasize the sustainable food value chain approach, as South Australia and Victoria have done.

In conclusion, research for this paper found that Australia has completely reformed itself (unlike Canada), doing away with two-price systems and supply management, trade barriers, export subsidies (explicit or implicit) and outright production subsidies based on output. (The latter fell from 71% of PSE in 1986-88 to zero in 2007-09. Canada's output subsidies as a share of PSE went from 59% to 53%.) Meanwhile, Australia is now moving toward exploiting the value chain with a more holistic approach that recognizes the need for more whole-of-chain/multi-disciplinary/cross-functional agri-food policies and business strategies. Australians (governments and to a lesser extent corporations) seem to have a head start getting their heads around the sustainability agenda as they accept the complexity of the task, the lack of evidence, and the inherent trade-offs (economic versus environment versus social) in the

pursuit of sustainable food systems.

While the government of South Australia has certainly embraced these principles, other Australian states and the federal government are also moving down the path toward multi-disciplinary whole-of-chain policy formulation. Australia is still in the early stages, but all signs indicate more and more value-chain thinking by Australian government policy makers and corporate strategy developers will emerge in the future.²⁴

In addition to being behind Australia in reforming past policies, Canada is also behind Australia in terms of fostering, for the future, a more holistic approach and more whole-of-chain/multi-disciplinary/cross-functional agri-food policies and business strategies. Canada has something to learn from Australia.²⁵

Brazil is emphasizing a supply push strategy, in which an abundance of land and a "yield gap" to be closed with productivity increases have yet to be exploited. Infrastructural deficiencies also persist. China has a comparative advantage in labor-intensive products such as fruits and vegetables and livestock products. Canada can learn from the EU, which is implementing more sustainable value chain policies and a concern for environmental payments. Canada has the least to learn from the US, where subsidies are concentrated in only a few commodities and for the most part go to large farms.

References

1. See OECD (2010), Anderson and Valenzuela (2009) and Anderson (2009a).
2. A nominal rate of assistance measures the share of producer revenues due to trade protection and subsidies. For example, a value of 0.5 indicates 50% of total revenues are due to government intervention. It should be noted that the data used by the Kym Anderson World Bank project excluded decoupled payments.
3. The data ends in 2004 as the OECD does not report the PSE per commodity any longer.
4. For a good survey of policy reforms, see Anderson, Lattimore, Lloyd and MacLaren (2008).
5. See especially <http://www.daff.gov.au/>
6. See especially http://www.safoodcentre.com.au/__data/assets/pdf_file/0019/126091/safood_strategy_final_web1.pdf
7. See especially <http://new.dpi.vic.gov.au/about-us/dpi-publications/future-farming>
8. See especially the Brazil Ministry of Agriculture, Livestock and Food Supply, 2008, English version of “Brazil Agricultural Policies”
http://www.agricultura.gov.br/images/MAPA/arquivos_portal/brazil_agricultural_policies_web.pdf
and the “Brazil Agricultural Livestock Plan 2007-2008”
http://www.agricultura.gov.br/pls/portal/docs/PAGE/MAPA/MENU_LATERAL/ENGLISH_REPOSITORY/BRAZIL%20AGRICULTURAL%20LIVESTOCK%20PLAN%202007-2008_0_0.PDF
9. It should be noted that over half of the 210 million hectares of “pasture” land may have low potential for annual or semi-perennial (e.g. sugar cane) crops because of the topography, bad soil, very dry areas, swamps, etc. The 101 million acres of “Non exploited” land may not be economical for agricultural production, given current prices and technology.
10. See FAO (2006).
11. See especially Huang and Rozelle (2009a).
12. See summary of July conference, see http://ec.europa.eu/agriculture/cap-post-2013/conference/index_en.htm and summary by Matthews http://ec.europa.eu/agriculture/cap-post-2013/conference/pdf/matthews-closing-report_en.pdf
13. See Bureau and Mahe http://www.notre-europe.eu/uploads/tx_publication/Etude64-CAP-Propositions-EN_01.pdf
14. For detailed information on Dutch agriculture and policies, see the Dutch Ministry of Agriculture <http://www.minInv.nl/> and the Dutch agricultural economics research institute (LEI): <http://www.lei.wur.nl/UK/>
15. Another key reason was the land market situation. Although there was private land ownership, there were restrictions on foreign ownership and but contract law problems where banks did not lend because there was no way to put a lien on loans.
16. Recall also that EU subsidies were phased in over time for Eastern European countries and so lagged that received by EU farmers.
17. For a good overview of Slovak agricultural policies, see the “Report on Agriculture and Food Sector in the Slovak Republic” at <http://www.land.gov.sk/en/index.php?start&language=en&navID=16&id=20>
18. For a good daily update on the farm policy debate in the U.S., see <http://www.farmpolicy.com/>
19. See testimony by Babcock http://www.farmpolicy.com/wp-content/uploads/2010/05/House-Ag-Committee-Hearing_10_May_132.pdf
20. Energy-intensive and trade-exposed sectors are allocated free allowances in both the Waxman-Markey bill (H.R. 2454), passed by the House of Representatives last June, and the recent Senate proposal — the American Power Act of 2010 — sponsored by Kerry-Lieberman.
21. AAFC, Components of the Canadian Agriculture & Agri-Food System, 2008.
22. This table used value of production data as assembled by the OECD for PSE and TSE computations, and is the reason that 2008 ratios are not reported for some countries.
23. See USDA’s Strategic Plan FY 2010-2015 at <http://www.ocfo.usda.gov/usdasp/sp2010/sp2010.pdf>
24. Personal communication Andrew Fearn, University of Kent.
25. It is true that Canada can teach some things to the rest of the world, including Australia, like the advantages of whole farm income and insurance programs. There are probably other examples but we only focus on the rest of the world and what Canada can learn from it – not vice-versa, which would be a legitimate line of inquiry in and of itself but one that is not explored here.