

Unclassified

TAD/CA/APM/WP(2010)41/FINAL



Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

09-Jun-2011

English - Or. English

TRADE AND AGRICULTURE DIRECTORATE
COMMITTEE FOR AGRICULTURE

TAD/CA/APM/WP(2010)41/FINAL
Unclassified

Working Party on Agricultural Policies and Markets

**AGRICULTURAL POLICIES FOR STRENGTHENING INCOMES IN DEVELOPING COUNTRIES:
A SYNTHESIS**

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JT03303528

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Note by the Secretariat

The project "Agricultural policy choices in developing countries" is mandated under Output Area 3.2.1, Intermediate Output result 4.3 of the 2009-10 PWB of the Committee for Agriculture. This document is the synthesis report of the project. It was prepared by the OECD Secretariat, drawing on four background reports. Three of these were declassified on the responsibility of the Secretary-General at the 53rd session of the Working Party on Agricultural Policies and Markets on 1-3 March 2011:

- A strategic framework for strengthening rural incomes [TAD/CA/APM/WP(2010)42/FINAL], prepared by Jonathan Brooks of the OECD Secretariat;
- Stabilisation policies in developing countries after the 2007-08 food crisis [TAD/CA/APM/WP(2010)44/FINAL], prepared by Philip Abbott;
- The use of input subsidies in developing countries [TAD/CA/APM/WP(2010)45/FINAL], prepared by Steve Wiggins and Jonathan Brooks.

The fourth paper was declassified at the 30 May-1 June 2011 meeting of the Working Party on Agricultural Policies and Markets:

Modelling the distributional implications of agricultural policies in developing countries – the Development Policy Evaluation Model (DEVPEM) [TAD/CA/APM/WP(2010)43/FINAL], prepared by Jonathan Brooks, Mateusz Filipski, Erik Jonasson and J. Edward Taylor.

This document was declassified at the 30 May-1 June 2011 meeting of the Working Party on Agricultural Policies and Markets.

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AGRICULTURAL POLICIES FOR STRENGTHENING INCOMES IN DEVELOPING COUNTRIES: A SYNTHESIS

POLICY CONCLUSIONS

This study addresses the role of agricultural policies in raising incomes in developing countries. Higher incomes are essential for sustained progress on the first Millennium Development Goal (MDG1), which calls for the eradication of extreme poverty and hunger, and includes a specific target of reducing by 50% between 1990 and 2015 the proportion of people living on less than a dollar a day. The aim is to identify ways in which the appropriate set of policies may vary according to a country's stage of development.

In addressing this question, it is helpful to make a distinction between policies that are likely to be effective in the short to medium term, a period which now encompasses the timeframe of MDG1, and those that are likely to produce fundamentally stronger incomes in the long term. In the short to medium term economic structures are fixed, while in the long term they can evolve.

In the short to medium term, there is a need to raise the basic incomes of the poor and to strengthen systems of social protection. Since two-thirds of the world's dollar-a-day poor live in rural areas, where farming is a core economic activity, this implies policies and investments that raise economic returns within agriculture.

In the long-run, there is a need to anticipate the structural changes in agriculture that accompany successful economic development. These include (i) a declining share of agriculture in GDP as the economy develops and diversifies; (ii) a release of labour from the sector driven by a combination of the "push" of labour-saving technical change in agriculture and the "pull" of growing labour demand in non-agricultural sectors; and (iii) rising agricultural output.

This means offering multiple development pathways for farm households: improving competitiveness (*i.e.* productivity) within the agricultural sector; diversifying income sources among household members; and, for some, leaving the sector for better paid jobs.

Within agriculture, there are rising opportunities for smallholders, who typically underpin developing country agriculture, to establish commercially viable operations. Yet exploitation of those opportunities will itself imply some less productive smallholders moving on to other, ultimately more remunerative, activities. Even in poor agriculture-dependent economies there is thus a need to strengthen opportunities outside as well as within farming.

Many of the policies required to improve farmers' opportunities are non-agricultural. Improvements in education and primary healthcare are key to prospects within and outside the sector. Equally important is the overall investment climate, which depends on factors such as peace and political stability, sound macroeconomic management, developed institutions, property rights and governance. In agriculture-dependent economies, there is a strong case for increasing the share of public spending allocated to sectoral public goods, such as rural roads and agricultural research, and to technology transfer, farm extension and advisory services.

This long-term approach is consistent with the overall policy recommendation for OECD countries, which suggests that governments can promote long-term agricultural development by reducing market failures, ideally by tackling them at source, and by providing public goods. It leaves an important role for targeted social policies in helping farmers who cannot adjust within the current generation, and for addressing immediate concerns about the level and distribution of income.

In low income countries, however, it has been suggested that – because of weak institutions and endemic market failures – market interventions might also be warranted. Price support, price stabilisation, and input subsidies have been proposed as ways of addressing short-term objectives with respect to incomes, poverty and food security, and of promoting long-term economic development.

In the short-term, price policies provide an easy lever for government, but are inefficient at addressing income concerns. Price support for food products is a blunt instrument because, among the poor, there are net sellers and net buyers of food – in many poor countries, the majority of farm households are net buyers. Price stabilisation (as opposed to price support) can limit the impact of adverse shocks on producers and consumers, but often proves to be fiscally unsustainable. A preferable option for the poor – both producers and consumers – is targeted social programmes, including cash transfers, although these may be difficult to implement in the poorest economies. At the same time, agricultural investments can improve farmers' resilience to risk.

Over the long-term, market interventions treat the symptoms of market failure and underdevelopment, rather than the causes. Price stabilisation can provide a more stable investment climate, but thwarts the development of private risk management, and can export instability onto world markets. Input subsidies can redress failings such as the under-development of infrastructure, missing markets for credit and inputs, and a lack of knowledge of the benefits of using improved seed and fertiliser, but can impede the development of private markets. In both cases, the benefits and costs of intervention need to be judged relative to the benefits and costs of tackling the underlying problems directly.

Finally, there are dangers in using market interventions to address multiple economic and social objectives. Such programmes can become an easy target for interest groups, outliving their original justification and becoming a budgetary millstone. An important priority is that expenditures on market interventions should not crowd out essential investments in support of long-term agricultural development.

1. Introduction

1. This project is concerned with the role that agricultural policies can play in raising incomes in developing countries, recognising that higher incomes are a pre-requisite for sustained poverty reduction and improved food security. A subsidiary question is whether the pursuit of higher incomes implies a role for agricultural policy which differs systemically from that prescribed for high income OECD countries, or varies according to a country's stage of economic development.

2. According to the World Bank, there are approximately 1.3 billion people living on less than USD 1.25 per day (Chen and Ravallion, 2008). At the same time, FAO estimates that nearly a billion people are undernourished, most of whom are chronically hungry because they are poor. Raising incomes is central to the near term target of the first Millennium Development Goal (MDG1), which calls for the eradication of extreme poverty and hunger, with specific targets which include halving between 1990 and 2015 the proportion of people living on less than a dollar a day. The world as a whole may achieve this target, thanks primarily to rapid income growth in East Asia (and China in particular). But in many parts of the world, notably in Africa and South Asia, progress on MDG1 has been weak or non-existent. Moreover, the FAO estimates that high food prices in 2007-08 plunged millions into hunger.¹

3. The pursuit of higher incomes is one objective of government policy. There are other dimensions to poverty and food insecurity, and governments have related concerns such as raising farm productivity, ensuring sustainable resource use, and promoting gender equality. The nature of these objectives may differ fundamentally from those in OECD countries. Food security, poverty and hunger are often on a different scale compared with OECD countries, while environmental issues, such as climate change and desertification, may have enormous implications for rural livelihoods.

4. Developing countries also vary widely in terms of natural resource endowments, the types of agriculture systems that are in place, farm sizes and land tenure laws, basic levels of human development in areas such as health and education, and the development of government and administrative infrastructure. A specific concern is that markets are less developed than in higher income countries. For example transaction costs may be higher in output markets, meaning that farmers are less engaged with markets; some markets (*e.g.* for credit and insurance) may be missing altogether, and market failures (*e.g.* arising from insecure property rights, incomplete information, or market power) may be more endemic.

5. Faced with diverse objectives and constraints, governments seek to choose the most appropriate instruments. Within the realm of agricultural and rural policy, their options include:

- Interventions in markets for outputs and inputs: price and trade policies; marketing policies; input subsidies (*e.g.* for seeds, fertiliser and working capital credit).
- The provision of public goods, such as rural infrastructure.
- Income transfers.
- Changes to institutions (setting up or eliminating marketing boards, land reforms, financial sector reforms, property rights and legal framework).

1. The FAO estimates the global total of chronically hungry people at 925 million in 2010, down from 1.023 billion in 2009, principally due to food prices declining from their 2007-08 peaks.

6. In the case of developed countries, OECD has established a basic principle for choosing among these instruments, stemming from the notion that policy objectives can be divided into two categories: those concerned with correcting market failures (an efficiency issue) and those concerned with the distribution of income (an equity issue). The principle is that policy should first seek to address market failures – ideally by tackling them at source – and then address distributional concerns with targeted policies. This approach contrasts with one of using blunt market-distorting instruments, such as price supports and input subsidies, to address multiple objectives (OECD, 2002).

7. With respect to the income objective, this policy recommendation implies safeguarding incomes in the short term via targeted social policies, and strengthening them in the long term by addressing market failures and weaknesses in the “enabling environment”. In poorer countries, however, it has been argued that market failures are more widespread and it is often difficult to tackle them directly. For example, farmers may have low incomes partly because they have no access to credit. Input subsidies have been suggested as a practical solution to the otherwise difficult problem of developing input markets and providing financial services to small farmers. Similarly, price stabilisation has been proposed as a relatively simple way of mitigating the impacts of price shocks on poor households, as opposed to market-based forms of risk management or the provision of income safety nets.

8. In considering the role for agricultural policies in strengthening incomes, it is helpful to make a distinction between policies that are effective in the short to medium term, a period which encompasses the timeframe of MDG1, and those that are likely to produce fundamentally stronger incomes in the long term. In the short to medium term economic structures are fixed, while in the long term they can evolve. Three quarters of the world’s dollar a day poor live in rural areas (corresponding to 880 million people), and most depend on agriculture for their livelihoods, so there is an immediate need to strengthen agricultural and rural incomes. In the longer term, it is important to consider the evolution of the agricultural sector and the rural economy, and in particular the prospects for smallholders, who form the backbone of developing country agriculture.

9. Section 2 examines the short to medium term impacts of alternative agricultural policies in developing countries using a new model, the Development Policy Evaluation Model (DEVPEM). The aim of the model is to provide illustrative results that show how structural diversity among developing countries, and systemic differences between developed and developing countries, can affect the welfare and distributional outcomes of alternative agricultural policy interventions.

10. When markets function smoothly, the OECD’s Policy Evaluation Model (PEM) has shown that policies which interfere with the functioning of those markets, such as price supports and input subsidies, perform poorly in terms of raising the incomes of farm households (OECD, 2001; OECD, 2003). By contrast, targeted income payments are shown to be both more efficient and more equitable. The question is whether these conclusions hold when markets do not work smoothly. DEVPEM incorporates several specificities of developing countries that may affect the welfare impacts of agricultural policy interventions. One is the joint role of the farm household as both a producer and consumer of food crops. A second is the prevalence of high transaction costs, which may inhibit farmers’ participation in markets. A third factor is heterogeneity among households in terms of their income sources, expenditure patterns and endowments of factors (particularly land).

11. Section 3 describes some important aspects of long-term structural change and the agricultural transformation. The main thesis of this section is that the long term (*i.e.* inter-generational) future for many agriculture-dependent households will lie outside the farm sector. Accordingly governments need to anticipate this process, adopting long-term policies that both improve the productivity of those who are potentially competitive within the sector, and generate opportunities outside the sector for those who are not, or in the long-term have superior prospects elsewhere.

12. Section 4 proposes a strategic framework for improving rural incomes in developing countries. A distinction is made between measures that are likely to be effective in the short-term and those that are likely to sustain economic development and promote wider employment opportunities in the long-term. A key point here is that there may be both complementarities and trade-offs between short and long-term policies. For example, income support may boost incomes in the short term while sowing the seeds for deeper development by offsetting market failures and enabling farmers to break out of “poverty traps”. On the other hand, subsidies to farmers may raise incomes but ultimately impede sectoral development and the adjustment into more remunerative activities. The strategic framework establishes a mapping between alternative development pathways and potentially relevant policy instruments, situating agricultural policies among the broader suite of measures at the government’s disposal.

13. For both short and long term objectives, agricultural policies have been proposed on the basis that they provide practical alternatives when best practice options are not possible. Agricultural market interventions are not the theoretically optimal way of providing social protection (where social safety nets are to be preferred); nor, in the absence of market failures, are they the ideal way of fostering growth, since they treat the symptoms of a lack of competitiveness, rather than its underlying causes. Nevertheless, plausible reasons have been suggested why, given weak institutions, high transactions costs and endemic market failures, agriculture-specific interventions might be desirable. Price stabilisation has received renewed interest in the wake of the 2007-08 food price crisis, during which policy makers in many developing countries felt impelled to act quickly, rather than address the underlying issue of risk management. Similarly, input subsidies have been seen as a possible solution to the weak performance of African agriculture, with the World Bank advocating the use of “smart subsidies” (e.g. for seeds and fertiliser) as a way of “jump-starting” agricultural markets (World Bank, 2007). Sections 5 and 6 discuss the pros and cons of using these particular instruments. Section 7 provides concluding remarks on the potential role for agricultural policy in strengthening incomes in countries at varying stages of economic development.

2. The short to medium term effects of agricultural policies in developing countries

14. In the case of OECD countries, the OECD has used its Policy Evaluation Model (PEM) to examine the “transfer efficiency” of farm support policies in OECD countries, *i.e.* the effectiveness of alternative instruments in raising the incomes of farm households relative to the cost to consumers and taxpayers (OECD, 2001). A general finding of this analysis is that, when markets function smoothly, policies that interfere with the functioning of those markets, such as price supports and input subsidies, perform poorly in terms of raising the incomes of farm households, with a significant share of the transfer leaking to input suppliers or leading to deadweight efficiency losses.² Thus, a dollar of market price support raises the incomes of farmers by less than half a dollar, while input subsidies increase farm households’ incomes by just one third of a dollar. By contrast, payments which distort markets less, such as payments based on area, are considerably more effective at raising farm based incomes. That said, no form of payment linked to farming in any way provides the gain in net income that would result from a fully decoupled income payment. A further finding of OECD work is that market interventions also often have perverse distributional effects, paying more to larger and richer farmers than to smaller and poorer ones, and taking money away from consumers and taxpayers to boost the incomes of households whose incomes are already above average (OECD, 2003a).

15. The chief reason that market distorting policies are so inefficient is that they stimulate output, and with it the farmer’s demand for inputs. This in turn bids up the price of land and purchased factors, such that a large share of the benefits accrues to non-farming landlords and suppliers of purchased inputs. There

2. The deadweight losses reported here are the consequence of domestic resource allocation effects and, in the case of exporting countries, include transfers to overseas consumers via lower world prices.

are several possible reasons why these results might not carry over immediately in the context of low-income countries. One is that the supply response might not occur, because farmers are locked into subsistence farming and, perhaps because of high transaction costs, cannot effectively respond to price signals. A second possibility is that the increased demand for factors is not reflected in higher rental rates or prices for purchased inputs (either because the market is missing or because prices are determined exogenously). A third is that farmers may own their own land and purchase relatively fewer inputs, implying less scope for the benefits of policy to leak to other agents. A new model, DEVPEM, admits these possibilities.

16. The purpose of DEVPEM is to illustrate how structural diversity among developing countries, and systemic differences between developed and developing countries, can affect the welfare and distributional outcomes of alternative agricultural policy interventions. DEVPEM departs from PEM by incorporating several specificities of developing countries that are likely to affect the welfare impacts of agricultural policy interventions.

- One important feature of developing country agriculture is the joint role of the farm household as both a producer and consumer of food crops. This means that the effects of policies such as farm price support depend on what happens on both the supply side and the demand side. While higher prices stimulate production, they also raise the opportunity cost of consuming home-produced food. In many developing countries, an important share of farm households are net buyers of food, so raising farm prices could lower incomes for this group (unless they show a sufficient supply response to be transformed into net sellers).
- A second factor is that many farm households confront high transaction costs when selling output or purchasing inputs. In the extreme, these transaction costs may be so high that the farmer remains cut-off from the market altogether, producing only for home consumption (that is, subsistence). Under these circumstances a subsistence farm household may not benefit from higher farm prices, and could in fact lose via induced increases in land rental rates or in the prices paid for purchased inputs.
- A third aspect is that rural households are heterogeneous in terms of their income sources, expenditure patterns and ownership of factors (particularly land), and will therefore be affected diversely by the direct and indirect impacts of policies. A comprehensive model of the agricultural sector in less-developed countries must consider the behaviour of structurally diverse agents, including commercial farms, semi-subsistence and subsistence farms, and landless rural households.

17. A detailed description of the model is contained in the paper “Modelling the Distributional Impacts of Agricultural Policies in Developing Countries: The Development Policy Evaluation Model (DEVPEM)” [TAD/CA/APM/WP(2010)43/FINAL] and “The Development Policy Evaluation Model (DEVPEM): Technical Documentation” [TAD/CA/APM/WP(2011)22]. DEVPEM is a disaggregated model of the rural economy, which retains some key aspects of PEM, notably the imperfect transferability of land from one activity to another, which is central to the farmer’s ability to respond to policy shocks. As with PEM, output and factor markets are linked, and the effects of policies on household incomes are determined by how those policies alter returns to factors that the household owns (land, labour and capital). The model is static and therefore suitable for analysing policy impacts over the short to medium term. As currently structured it does not capture a range of market failures, such as liquidity and risk constraints, that may affect policy outcomes.

18. DEVPEM models are constructed for six countries, two in Africa (Ghana and Malawi); two in Asia (Bangladesh and Vietnam); and two in Latin America. The models are constructed using household

level data from the FAO's Rural Income Generating Activities (RIGA) and market aggregates from the FAOSTAT database. The virtue of the RIGA database is variables have been standardised across countries, which makes it relatively straightforward to build and parameterise DEVPEM models, and helps ensure comparability across countries.

19. The six DEVPEM models are relatively stylised, and should not be considered as representing the full structural diversity of these countries or the precise way in which their rural economies function. Rather, the aim is a more modest one of shedding light on how basic structural differences among countries may affect agricultural policy outcomes. Each country model has six household types. There are large, medium and small-scale farm households, and a non-farm household category (which contains agricultural wage earners). The small and medium scale farm households are divided into "remote" and "non-remote" categories, with the former cut off from food markets by prohibitive transaction costs.

20. We analyse the effects of five different policies in each of the six countries included in the study. Three of the policies are *market interventions*, in the form of market price support, a production subsidy, and an input subsidy; one of them is a *social transfer*, in the form of an unconditional cash transfer; and one is a *public-good investment* that lowers transaction costs for remote households and facilitates access to markets. We are interested firstly in the ability of each policy to increase the welfare of rural households, and how costs and benefits are distributed across household groups in each country; and secondly in how cost efficient each policy is in terms of raising the welfare of the targeted population for every dollar spent on the policy.³ In the case of the public good investment, we can measure the welfare benefits that derive from reducing transaction costs, but cannot say anything about the costs of this policy or its relative cost-effectiveness. The welfare effects are shown in Table 1. The main findings are:

- Market price support (MPS) for food crops harms rural non-farm households in five of the six countries, with consumption side losses exceeding any gains from higher wage incomes. The benefits to farm households are typically small, and are concentrated among medium-sized and large farmers. Only in Ghana are there significant benefits across all five farm household groups.
- MPS for livestock products similarly harms rural non-farm households in all six countries. Small farm households are either unaffected or suffer a small welfare loss in all countries but Nicaragua, where they gain significantly. In the two African countries and in Vietnam effectively no one benefits from the policy. Gains are small in Bangladesh and Guatemala, the only case in which MPS for livestock significantly increases welfare being for medium-sized and large farmers in Nicaragua, a consequence of the large share of livestock in the product mix of Nicaraguan farmers.
- By contrast, there are no significant welfare losses in the rural economy from MPS for cash crops, because there is no domestic consumption. Except in Ghana, where small farmers grow cocoa beans, the welfare effects are negligible for small farmers and non-farm rural households. The gains are significant for medium and large-scale farmers in three of the six countries: Guatemala, Nicaragua and Vietnam.
- A production subsidy (PS) for the main food crop, which has the same economic effect as a deficiency payment, affects farmers on the producer side in the same way as market price support, but leaves the consumer side unaffected. As a result, no household group loses significantly, although the gains tend to be concentrated among medium and large-scale farmers more than small farmers.

3. Market prices could of course be suppressed in order to benefit urban consumers. In this case, the results would be the mirror of those reported here.

- In contrast with MPS, an input subsidy (IS), modelled as a discount on the price farmers pay for intermediate inputs, benefits “remote” households who are cut off from output markets. Welfare increases are higher for medium and large scale farmers, but significant for small farmers in all countries except Bangladesh. The gains are largest in Vietnam, where existing use of fertiliser is highest.
- The input subsidy experiment is run under the assumption that the price of inputs is endogenously determined. If input prices are exogenous, *i.e.* set at the world market level plus a fixed per unit distribution cost, then the gains approximately double for each household group.⁴
- When households receive an unconditional transfer equal to 1% of their original income, they also observe a 1% increase in their final welfare, with general equilibrium effects (*e.g.* as a result of households switching between activities) not significant.

4. The nature of the domestic market for fertiliser will be context specific. We assume rising internal distribution costs, reflecting infrastructure bottlenecks, which are reflected in a supply elasticity of 2.0. Quizón and Binswanger (1986) in an application to India assume a higher elasticity of 4.0, based on openness to trade. Ryan and Perrin (1974) in an examination of the market for potatoes in Peru argue that it is plausible to assume perfectly elastic supplies, since fertiliser is imported. We adopt the latter as an alternative assumption.

Table 1. Simulation results of rural household welfare effects of various agricultural policies (% change)

	Ghana	Malawi	Guatemala	Nicaragua	Bangladesh	Vietnam
Market price support, food staple						
Non-Farm	-0.11	-1.71	-0.25	0.31	-0.81	-0.89
Small Remote	2.60	-0.08	-0.03	0.29	-0.04	0.30
Small Non-remote	1.29	-0.93	0.03	0.49	-0.06	0.30
Medium Remote	0.68	-0.13	-0.04	0.16	-0.44	-0.51
Medium Non-Remote	2.32	0.25	0.26	0.63	0.91	1.46
Large Farm	2.29	1.22	0.40	0.28	1.02	1.05
Market price support, cash crop						
Non-Farm	0.34	0.00	0.23	0.44	0.01	0.15
Small Remote	1.26	-0.08	0.62	0.68	0.06	0.13
Small Non-remote	0.11	-0.04	0.25	0.34	0.07	0.20
Medium Remote	1.15	0.59	2.70	2.04	0.16	1.04
Medium Non-Remote	0.47	0.44	1.78	2.20	0.26	1.14
Large Farm	0.78	0.12	1.77	2.18	0.27	5.09
Market price support, livestock						
Non-Farm	-0.34	-1.37	-1.13	-0.21	-0.56	-1.36
Small Remote	-0.03	-0.01	-0.02	2.31	-0.15	-0.67
Small Non-remote	0.04	-0.38	-0.32	0.92	0.07	-0.38
Medium Remote	0.04	-0.01	-0.01	3.93	-0.22	-0.53
Medium Non-Remote	0.15	0.05	0.76	1.89	0.53	0.13
Large Farm	0.02	0.23	1.49	3.67	0.61	0.16
Production subsidy, food staple						
Non-Farm	1.68	0.01	0.04	0.42	0.12	0.32
Small Remote	2.60	-0.08	-0.03	0.29	-0.04	0.30
Small Non-remote	3.04	0.67	0.38	0.59	0.60	1.21
Medium Remote	0.68	-0.13	-0.04	0.16	-0.44	-0.51
Medium Non-Remote	4.08	1.13	0.56	0.71	1.66	2.32
Large Farm	3.68	1.74	0.57	0.35	1.57	1.82
Input subsidy						
Non-Farm	0.28	0.14	0.03	0.13	0.03	0.41
Small Remote	0.77	0.56	0.56	0.26	0.16	1.61
Small Non-remote	0.46	0.53	0.10	0.22	0.19	0.85
Medium Remote	1.25	0.80	0.72	0.59	0.62	2.54
Medium Non-Remote	0.88	0.88	0.88	0.67	0.56	1.77
Large Farm	1.14	1.03	1.20	0.68	0.37	2.80
Public-good investment						
Non-Farm	0.2	0.0	0.1	0.4	0.0	0.1
Small Remote	1.2	0.1	1.3	3.5	0.1	1.2
Small Non-remote	0.1	0.0	0.0	0.1	0.0	0.1
Medium Remote	3.5	0.7	4.4	7.2	0.2	5.3
Medium Non-Remote	0.0	0.0	-0.1	-0.1	0.0	-0.2
Large Farm	-0.1	-0.1	-0.2	-1.1	0.0	-0.5

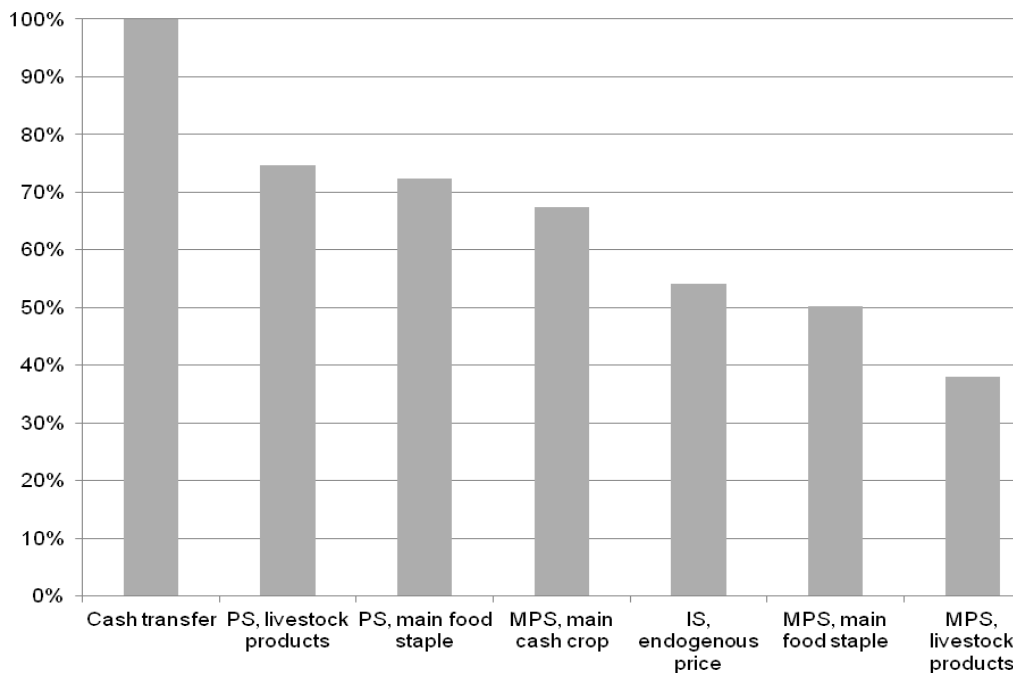
Note: The market price support simulations assume a 10% exogenous price increase in the targeted commodity. The production subsidy simulations assume that farmers are given a 10% subsidy for all output produced of the targeted commodity. The input subsidy simulation assumes that farmers are given vouchers, which gives them 10% discount on the targeted agricultural input. The public-good investment simulation assumes that transaction costs are eliminated for households located remotely from markets.

Source: DEVPEM simulation results, Annex 1, "Modelling the Distributional Implications of Agricultural Policies in Developing Countries: The Development Policy Evaluation Model (DEVPEM)".

21. We measure the cost efficiency of alternative instruments as the overall change in rural welfare divided by the cost to urban taxpayers and (in the case of food price support) consumers. The average efficiency across all six countries is shown in Figure 1. The benchmark experiment of an unconditional cash transfer, as designed, has a cost efficiency of 100%. Among policies that involve interventions in

commodity markets, those without negative consumer side-effects have higher levels of efficiency. The efficiency of the production subsidy exceeds 70%, while the efficiency of MPS to cash crops is on average 67%. The policies with the lowest levels of efficiency are those that harm rural households on the consumption side, namely price supports for food crops and livestock products, with efficiency levels below 50% in many cases. The efficiency of input subsidies is low (54%) on the assumption that prices are determined endogenously, but much higher if prices are taken to be exogenous (over 90%).

Figure 1. Cost efficiency of various agricultural policies (averaged across the six countries)



Source: DEVPEM simulation results, Annex 1, "Modelling the Distributional Implications of Agricultural Policies in Developing Countries: The Development Policy Evaluation Model (DEVPEM)".

22. The first conclusion from these policy experiments is that no untargeted agricultural policy intervention is pro-poor within the rural economy. Market price support for food crops harms net buyers of food, often the poorest farm and non-farm (landless) households, although the proportion of net buyers varies significantly across countries.⁵ Support for cash crops does not have this drawback; however, cash crops are typically grown by farmers with relatively high incomes, so support seldom reaches the incomes of the poorest.

23. While all agricultural policy instruments are less efficient than a simple cash payment (in terms of net rural benefits relative to urban cost), the degree of inefficiency of some market interventions, notably input subsidies, is not inevitably as high as observed in developed OECD countries. The reason is that farmers are less likely to rent land than in OECD countries and they tend to purchase fewer inputs, which in turn imply fewer leakages away from the farm level. This result may have implications if agricultural policies can be targeted and if other factors germane to policy design and implementation are sufficiently important.

5. In an analysis of eleven countries for which RIGA data are available, Zezza *et al.* (2008) find that rural net buyers of food outnumber rural net sellers in all but one country (Vietnam).

24. Given that a cash transfer is the most efficient instrument, and can in principle be targeted to low income households, the justification for using an alternative instrument must come from some effect which is not captured by the DEVPEM model. One is the possibility of administrative difficulties with cash-based programmes, for example due to the absence of a population registry, or because of concerns about corruption (although these concerns also apply to other instruments). Another is the possibility of dynamic gains from market interventions, in terms of enabling farmers to overcome market failures and break out of “poverty traps”. The latter has been invoked as a justification for input subsidies (Dorward, 2009).

25. Input subsidies tend to benefit those farmers who are using inputs already – often larger farmers. The extent to which the benefits of support are retained by farmers depends partly on the degree to which the price of inputs rises in response to the increase in input demand. Parallel investments that increase distribution capacity and help keep marginal distribution costs constant would reduce the leakage of benefits away from the farmer. Input subsidies can also in principle be targeted to improve their distributional outcomes. A wide range of other pros and cons are relevant when considering whether input subsidies are a relevant policy option – these are taken up in Section 6.

26. A significant finding is that a public investment which reduces transaction costs is the only pro-poor instrument, since it helps remote farm households, who are typically poorer than those engaged with markets. However, we do not know the cost of generating these improvements. If those investments bring down marginal input distribution costs, they could also improve the effectiveness of input subsidies. The implication here is that, if input subsidies are to be used, they should be accompanied by investments in infrastructure. Moreover, weak infrastructure, which impedes market profitability, is often a reason for farmers failing to use inputs in the first place – so such investment could replace as well as complement an input subsidy.

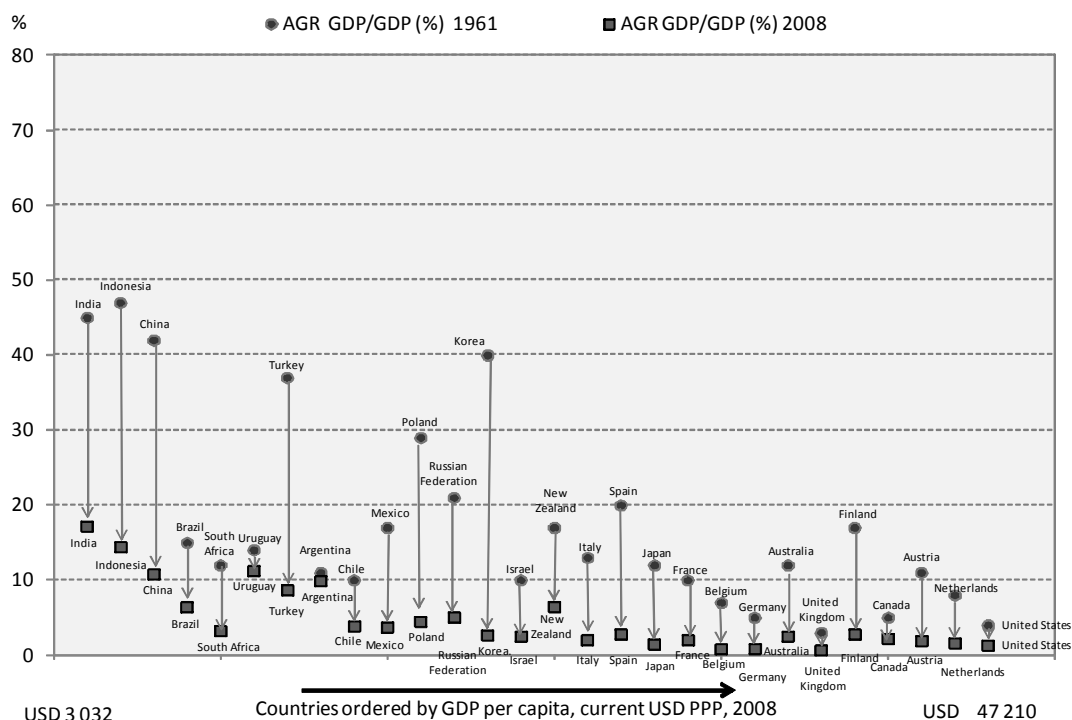
27. In general, the results show that direct payments are the most efficient way of boosting incomes in the short-term, while public investments, which should also have broader long-term pay-offs, have short to medium term impacts that are pro-poor. These results are therefore fully consistent with the best practice advice established for OECD countries of using social policies to safeguard incomes in the short term, and non-distorting public investments to boost competitiveness in the long term. Whether there are caveats to this advice depends on whether considerations outside the model are sufficiently important to offset the shortcomings of market interventions on both efficiency and equity criteria. These are taken up in Section 5, which considers whether there is a role for government in stabilising markets, and Section 6, which considers the arguments for and against using input subsidies.

3. Long-term structural change and the agricultural transformation

28. The process of long-term economic development is characterised by a sectoral transition away from an economic structure based on agriculture to one dominated by manufactures and services.⁶ The nature of this transition away from agriculture is apparent from the evolution of agriculture’s share of GDP and employment, shown in Figures 2 and 3 respectively for a range of OECD and emerging economies between 1961 and 2008. Graphs showing the evolution of agriculture’s share of GDP in a wider range of African, Asian and Latin American countries are contained in Annex Figure 1.

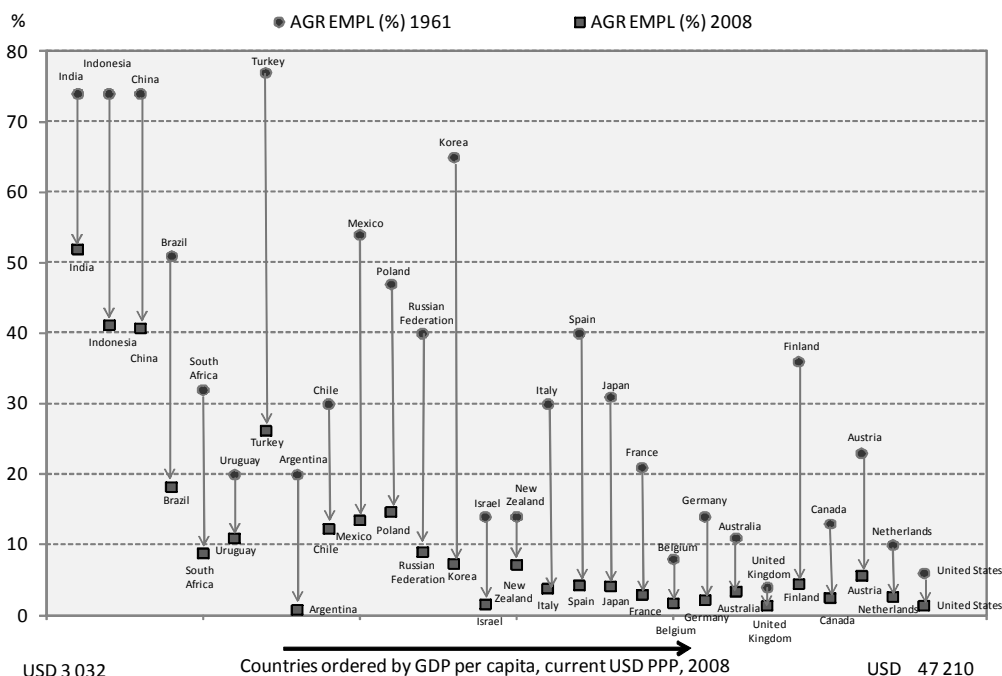
6. Other features of structural change with implications for policy include: a spatial transformation towards increased urbanisation; an institutional transformation to an economy based more on formal legislation than informal rules; and a demographic transformation, with falling death rates preceding lower birth rates.

Figure 2. Evolution of agriculture's share of GDP in various countries (1961 to 2008)



Source: FAO, 1999; WDI, 2008; IMF, 2008.

Figure 3. Evolution of agriculture's share of employment in various countries (1961 to 2008)



Source: FAO, 1999; WDI, 2008; IMF, 2008.

29. In general, agriculture's contribution to GDP declines as the economy develops, to the extent that high income OECD countries rarely have more than 2%-3% of GDP generated by their farm sectors. For

the sample of countries shown, agriculture's share of GDP has declined in *all* countries, including those with a strong comparative advantage in agricultural activities. A third point is that the decline of the share of resources in agriculture has been larger for countries with lower incomes, which have more scope for agricultural productivity improvements and for shifting resources into new non-farm activities (in developed countries, that shift has already occurred).⁷

30. Across the developing world, we see this pattern confirmed.⁸ In Latin America, agriculture's share of GDP has declined to less than 10% of the total in most countries, and is less than 20% in nearly all countries. In Asia, the ratio is above 30% in a few countries but has declined to between 10% and 20% across most of the continent. Agriculture's share has also declined in most African countries, but in several of the poorest countries, all with a per capita income of less than USD 1 000 per year and with agriculture still accounting for a third or more of GDP, agriculture's share of GDP has actually risen over the past 30 years. The majority of these countries have had weak or negative economic growth and have been marked by conflict or civil strife, attesting to the particular development challenges faced in the region.⁹

31. The declining share of agriculture in GDP is matched by the release of labour to other sectors, although that release appears to be non-linear. At low levels of development, there is evidence that the structural transformation has become progressively less successful at integrating low productivity agricultural labour into the rest of the economy (Timmer, 2010). Yet while it may be more difficult for unskilled farm labour in poor agriculture-dependent economies to be absorbed by other sectors than it was for, say, European farmers to move into industrial jobs a century earlier, once labour adjustment is underway – and, crucially, once labour has relevant skills – its pace is invariably more rapid than in the past. In Korea, agriculture's share of employment fell from 40% to 16% in just 14 years – a transition which took 53 years in the United States and 68 years in the United Kingdom (the first country to go through the industrial revolution).

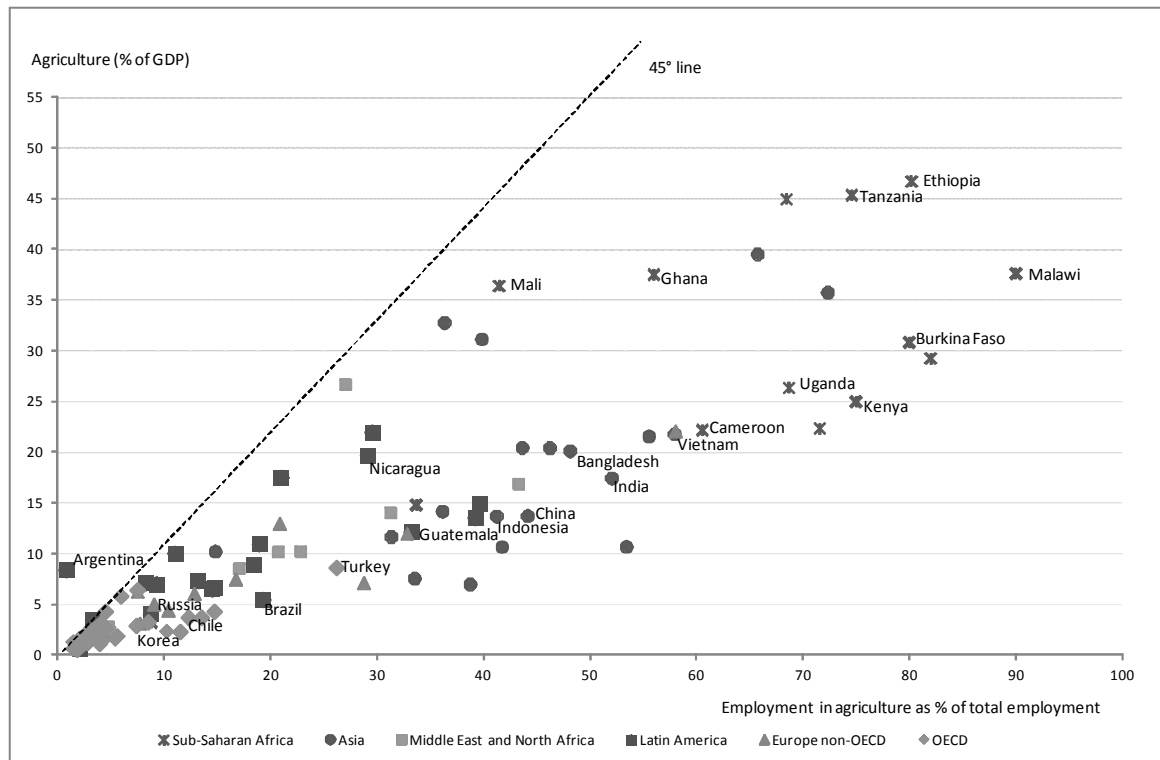
32. Asymmetries in the adjustment process are apparent from Figure 4, which compares agriculture's share of GDP with agriculture's share of employment for recent years in a large number of developed and developing countries. The 45-degree line corresponds to a situation in which the sector's share of GDP and its share of employment are equal, implying that labour is as productive in agriculture as in other sectors.¹⁰ Nearly all countries lie below this line, suggesting that agricultural labour is less productive (and hence receives lower returns) than non-agricultural labour, but there are wide differences across countries. As economies develop, and agriculture's share of both income and employment declines, labour productivity in agriculture tends to converge with that in other sectors. Yet for many poor countries that convergence appears to be deferred.

7. There are some exceptions, such as Brazil and Chile, where the changes have been large in absolute terms, but low relative to other countries at similar income levels. In these particular countries, import substitution industrialisation policies led to a rapid growth in manufacturing prior to the base year, bringing down agriculture's share of GDP; while more recently the liberalisation of policies has mitigated the tendency of resources to shift out of agriculture, as these countries have exploited their natural comparative advantage in agricultural activities.

8. See "A Strategic Framework for Strengthening Rural Incomes" [TAD/CA/APM/WP(2010)42/FINAL].

9. Agriculture's declining economic importance can be mistaken for economic malaise. Yet it is typically a sign of success, with agricultural output continuing to grow, but requiring fewer resources.

10. However, caution should be exercised in interpreting specific numbers as the definition of agriculture used in measuring GDP may not be the same as that used in recording employment.

Figure 4. Agriculture's share of GDP versus agriculture's share of employment, 2008

Source: World Development Indicators (2010) and national sources.

33. What drives these changes? The answer is the interaction between supply-side and demand-side effects. Productivity improvements permit a release of resources which may be absorbed within the rural economy, via a market for non-farm goods and services, or drawn in by the urban economy. On the demand side, once basic food demands are satisfied, the income elasticity of demand for food tends to be less than for other consumption goods, so the demand for food grows more slowly than the demand for other goods.

34. There has been an historical tendency to assume that productivity in agriculture grows less rapidly in agriculture than in the manufacturing sector, partly because there is less scope for benefiting from the division of labour. Indeed dual models of transition, such as the Lewis Model (Lewis, 1954) typically contrast a stagnant traditional rural sector with a dynamic and modern manufacturing sector. However, others have observed rapid science-based technical change in agriculture (for example, Hayami and Ruttan, 1985).

35. If agricultural productivity growth outpaces productivity growth in other sectors, we tend to observe a more rapid release of labour – the “push” out of the sector complementing the “pull” from relatively fast demand growth outside the sector. Despite this release of resources, the agricultural sector typically continues to expand in absolute terms. Those leaving the sector tend to be those who have not participated to the full extent in productivity improvements, and have thus become relatively less profitable, and those who have superior prospects in other sectors. On the other hand, if agricultural productivity growth is relatively slow, then that transition occurs more slowly and – when non-agricultural demand growth is weak – may not occur at all.

36. The pace at which resources are released from agriculture also depends on the international forces of supply and demand. Net demand for exports from overseas may slow the adjustment process,

while increasing import competition in the form of lower prices may accelerate it. The balance of these pressures should, in principle, be a reflection of a country's comparative advantage. Historically the terms of trade have tended to move against agriculture, as supply growth has outpaced demand growth. Insofar as prices reflect production costs, declining real prices are not a problem for innovative farmers, whose productivity changes are responsible for the price changes. However, for less efficient farmers, there is clearly a threat to profitability which, along with the possibility of improved opportunities in other sectors, can determine exit decisions.

37. In Figure 4, the countries furthest from the 45-degree line are those in which labour productivity in agriculture has languished and the sector has not been effectively assimilated into the rest of the economy. Improvements in the productivity of agricultural labour will tend to close the gap directly, while the outflow of less productive labour to more productive occupations in other sectors will narrow it indirectly. Several analysts have suggested that, in poor countries, the former can provide a more "pro-poor" pattern of development, with a particular need to focus on smallholder development (for example, Hazell *et al.*, 2007; FAO and World Bank, 2009). The direct impacts of smallholder growth are likely to be pro-poor because the majority of the poor live in rural areas, where agriculture is the dominant economic activity and smallholder farming is the predominant structure. Smallholder development can increase returns to assets that the poor possess – their labour and in some cases their land – and push down the price of staples, which is crucial when so many of the poor are net buyers of food. Indirectly, the benefits of smallholder growth are also likely to be pro-poor, because of potentially strong linkage effects to the rest of the economy.¹¹

38. Yet, with development, one would expect the economy to diversify and for growth outside agriculture to become progressively more important as a source of income growth. Moreover, in the long term, manufactures and services are capable of generating annual growth rates of 10% or more, whereas growth rates in agriculture seldom exceed 5%. How then should governments strike the balance between boosting incomes in the context of existing structures, where there is more immediate scope for poverty reduction, and facilitating the transition to a more diversified economy which has the potential to generate much higher average incomes?

39. Timmer (1998) has suggested that the basic supply and demand forces driving adjustment are associated with a four-phase adjustment process for the agricultural sector, with correspondingly different policy requirements. In the early stages of development, agriculture dominates output and employment, and the priority is to "get agriculture moving". The subsequent generation of a surplus within agriculture leads to a second period in which agriculture makes a key contribution to growth both directly and via a variety of linkages. In the third phase, agriculture's share of national income declines and agricultural incomes fall behind those in other sectors, so the priority lies in facilitating adjustment. The fourth and final phase is one in which the agricultural sector, including agricultural labour markets, are integrated into the rest of the economy.¹² This pattern is consistent with a U-shaped adjustment process where, initially, employment in agriculture declines more slowly than the sector's share of GDP, but then there is a more rapid release of labour from the sector as average incomes improve.

40. The adjustment process is also reflected in the World Bank's distinction between agriculture-dependent, transforming and urbanised economies. According to its 2008 *World Development Report*, approximately 170 million rural people with an income below a USD 1.08 a day incomes threshold in 2002 (measured in 1993 purchasing power parity dollars) live in agriculture-dependent economies

11. Empirically, a number of studies have confirmed that agricultural growth tends to be effective in reducing poverty (Irz *et al.*, 2001; de Janvry and Sadoulet, 2009; Cervantes-Godoy and Dewbre, 2010).

12. These four phases are associated, respectively, with the work of Mosher (1966); Johnston and Mellor (1961); Schultz (1964) and Ruttan (1977); and Johnson (1973).

(mostly in Sub-Saharan Africa). A much larger number of rural poor – 583 million in 2002 – live in transforming economies, a large proportion of them in China and India. The majority of the rural poor in Latin America live in “urbanised” countries.¹³ Even among agriculture-dependent economies, non-agricultural activities still account for the majority of national income, and there are few cases in which agriculture accounts for more than a third of GDP. Moreover, as discussed below, even development at low incomes is associated with a release of labour from farming. Thus while there may be a need to “get agriculture moving”, there is a parallel need to create opportunities outside agriculture as well as within it.

41. Different circumstances suggest a need for differentiated strategies, with agriculture prioritised at early stages of development.¹⁴ In terms of establishing the framework conditions, this is likely to imply a greater role for policy in overcoming market failures and a greater share of public expenditures going to providing essential public goods (such as agricultural research and rural infrastructure). With market failures likely to be more endemic in poorer countries, it has further been suggested that a different set of agricultural policy instruments is appropriate – a point taken up later.

42. Many of those farmers adjusting, both to more profitable operations within the sector, and out of the sector will be smallholders, who dominate developing country agriculture.¹⁵ So what are the implications for farm-level adjustment? There has been much debate over the relative efficiencies of small versus large farms. A range of benefits from small scale family farming have been noted. For example, farm labour may be easier to motivate and supervise, while smallholders may have important local knowledge and may be more adept at managing some forms of risk. On the other hand, there are important economies of scale beyond the farm in areas such as procuring inputs, obtaining information on markets and technical farming issues, in meeting standards and certifying production, and in transacting with large scale buyers from processors and supermarkets, with their exacting demands (Wiggins, 2009).

13. The World Bank defines agriculture-based economies as those in which agriculture contributes 20% or more to overall economic growth. Transforming economies are those in which agriculture contributes less than 20% to total growth yet 60% or more of the country’s poor live in rural areas. Urbanised economies are those in which agriculture contributes less than 20% to overall growth and less than 60% of the poor live in rural areas. More than 80% of the rural poor in Sub-Saharan Africa live in agriculture-based countries, while over 90% of the poor in Asia, the Middle-East and North Africa live in transforming economies. A majority of Latin America’s poor live in urbanised countries, although nearly one-half of the poor still live in rural areas. There are virtually no countries where agriculture contributes more than 20% to growth but in which the numbers of urban poor exceed the numbers of rural poor. Among developing countries, there is a strong correspondence between these three categories and three income classes for countries (low income, lower-middle income and upper-middle income) also specified by the World Bank.

14. Dorward (2009) has proposed three types of transformation strategy: ‘hanging in’ strategies, which are concerned to maintain and protect current levels of wealth and welfare in the face of threats of stresses and shocks; ‘stepping up’ strategies, which involve investments in assets to expand the scale or productivity of existing assets and activities; and ‘stepping out’ strategies, with accumulation of assets to allow investments or switches into new activities and assets.

15. The term “smallholder” refers not to farm size *per se*, but to producers with limited resource endowments relative to other farmers in the sector. Smallholders often struggle to be competitive, either because of this lack of endowments, or because they confront missing or under-developed markets. Insufficient farm size may be an issue, although other assets, such as farm management skills may also be lacking. The competitiveness of smallholders may also be undermined by external factors, such as subsidised exports arriving on internal markets. It is important to note that what constitutes a small farm may differ markedly from one country to the next. For example, the average farm size in many Asian countries is less than a hectare, whereas much larger operations in Latin America (ten hectares or more) may be considered as small.

43. Some of this debate may be beside the point, insofar as the relevant comparison is between small farms of less than a few hectares and not between small farms of less than a hectare and mega farms of several hundred hectares or more. Small farms may be technically and allocatively efficient, given the existing level of development, but economies of scale beyond the farm gate are likely become more apparent as the economy develops. In much of Africa, only a minority of farms produces a marketed surplus. A change in average farm size from say 0.5 ha to 2 ha, with more farmers recording market sales, would still correspond to small scale farming, but would nevertheless require a significant degree of farm level adjustment – in particular the release of labour from the sector. Moreover, consolidation would appear to be necessary to generate substantially higher per capita incomes, irrespective of efficiency considerations.

44. It is important to note that recognition of these adjustment pressures does not imply an anti-agriculture policy prescription, or that policy makers should seek to accelerate the shift of labour into other occupations. But it does require realism, a recognition that policy priorities will shift with economic development, and that not all small farms can be expected to evolve into successful commercial structures. In general, there is a need for balance in development, such that the release of labour from agriculture, which itself derives from productivity improvements, is matched by a concomitant demand from other sectors – *i.e.* labour is “pulled” rather than “pushed” out.

45. For all these reasons, while there may be a need for differentiated development strategies, there is a common need – across countries at all stages of development – to create opportunities both within and outside agriculture.

4. A strategic framework for strengthening rural incomes

46. In proposing a strategic framework for strengthening rural incomes it is helpful to make a distinction between the short to medium term issue of how best to support incomes, reduce poverty and tackle food insecurity (beyond immediate questions of humanitarian relief), and deeper long term questions regarding how best to strengthen incomes via economic development. There may be complementarities, with programmes that are effective in the short term sowing the seeds for longer term development, but there may equally be trade-offs, particularly with respect to public spending, so it is conceptually helpful to distinguish social policy from development policy.

47. A long term strategy for development needs to acknowledge the inevitability of the structural transformation that accompanies economic development. The strategy proposed below consists of: (i) enabling smallholders to become competitive or boost their incomes from other sources (diversification or exit); (ii) promoting a broader rural development strategy that does not focus exclusively on agricultural development, but seeks to create a more diversified rural economy; and (iii) strengthening institutions with a view to reducing the need for second best instruments.

48. The proposed framework suggests potential roles for government policy in providing the optimal balance of opportunities both within and outside agriculture. Following a discussion of the ability of alternative policy instruments to address short-term and long-term objectives, we illustrate the positive role that government can play with a case study of Thailand, which has successfully transformed from an agrarian country to an urbanised economy based around manufacturing. Rural poverty has fallen dramatically, as have hunger and malnutrition, while agricultural production has increased and a new class of commercially viable farmers has emerged.

4.1. Short to medium term policy options

49. The fundamental concern here is with how to improve incomes, and address poverty and food insecurity, over a time frame in which economic structures and household livelihoods are essentially fixed. If the adopted policies do not also raise incomes via long-term development, their income effects correspond to social protection.

50. Agricultural policies are not the ideal way of providing social protection. As shown in Section 2, they are likely to be less efficient than direct social transfers in raising incomes, and – in the absence of targeting – they fail to achieve pro-poor outcomes. The distributional effects of agricultural policies could be improved by targeting but this may be difficult for both practical administrative and political economy reasons. For example, it is difficult to restrict price guarantees to smaller farmers without using a deficiency payment system (in which case other forms of social payment must surely be feasible), or to limit fertiliser subsidies to those who would not otherwise purchase fertiliser.

51. Direct social transfers are in principle the most efficient way of supporting incomes, since they do not distort production and consumption decisions, and induce the efficiency losses examined in Section 2. However, there may be practical difficulties:

- One is that the necessary institutions and infrastructure may not exist for cash-based instruments to be used. For example, there may be no registry or information base by which to establish criteria of eligibility; remote farmers may not have a convenient way of spending cash; and – with weak institutions – such programmes may be particularly susceptible to corruption. However, across a range of developing countries, conditional cash transfers (CCTs) have become particularly popular over the past decade. These programmes transfer cash to generally poor households on the condition that they make pre-specified investments in the human capital of their children. CCTs have been found to be effective at increasing consumption levels among the poor, and have led to behavioural changes, although their impact on *final* outcomes in health and education has been less clear (Fiszbein and Schady, 2009). This may be due to the need for CCTs to operate in conjunction with complementary investments (*e.g.* in schools and hospitals). An issue with CCTs is when the “conditional” element is warranted. For example, it may not be worth incurring the monitoring and enforcement costs associated with the condition that parents put their children in school if they would do so anyway.
- A second concern is that social transfers are seen as explicit “welfare”, whereas market interventions are often justified on other grounds (even if they are disguised welfare). In low income countries, where family and social networks are the main form of social protection, there is some wariness about potentially weakening that aspect of the social fabric.

52. Various forms of market and price stabilisation have been suggested as alternatives to social protection, on the grounds that in poor countries there may be few other ways of containing the impacts of adverse price shocks on poverty and food security than by seeking to offset those impacts directly (for example by releasing/buying stocks, or by changing tariffs). Interest in input subsidies has similarly revived, notably in Africa, as a practical way of increasing food production in order to reduce poverty and hunger, while also “jump-starting” markets and enabling households to escape from poverty traps. While neither of these policies may be the optimal way of addressing either short-term or long-term objectives, the specific features of developing country agriculture – in particular the greater prevalence of market failures – have led to these policies being proposed as practical alternatives that are straightforward to implement. These arguments are assessed in Sections 5 and 6.

4.2. Long run policy priorities

53. Analysis of the agricultural transformation has suggested that agricultural strategies should (a) offer multiple pathways to higher incomes; and (b) situate agricultural policy among a broad set of instruments necessary to ensure sustained growth in real incomes.

54. Elements of a long term strategy for agricultural development, with a focus on smallholder adjustment, are set out in Table 2. Smallholder adjustment here is understood to be a path to higher long-term income, be that through improved competitiveness within the sector, income diversification (from agricultural or non-agricultural sources), or exit to other sectors. Adjustment pathways are described in the columns, and policy instruments in the rows. The first column (improving competitiveness within agriculture) applies to farm households only, but the other columns may apply to both farm households and wage earning (often “landless”) worker households. Note that the adjustment pathways (columns) are not mutually exclusive: for example, one household member can enhance the farm’s competitiveness while another provides off-farm income. Also, the instruments (rows) do not exhaust all possible policies, but focus on those with persuasive arguments. Social protection is seen here not as a way of offsetting transient shocks, but as the provision of long-term support for households that are unable to adjust.

Table 2. Strategic framework for smallholder adjustment

<i>Policy instrument</i>	Help farmers become more competitive within agriculture	<i>Adjustment pathway</i>			Social protection for those unable to adjust
		Diversify income sources		Leave the sector for off farm work	
		Within agriculture	Outside agriculture		
Price policies	Treats symptoms of uncompetitiveness rather than causes	May impede adjustment			Price stabilisation proposed as a 2 nd best safety net
Input subsidies	Treats symptoms of uncompetitiveness rather than causes		May impede adjustment		Proposed as 2 nd best instrument for the poorest countries
Credit policies	May correct market failures	Indirect impacts			
Investment in human capital	Minor effects of formal education for this generation; technical training more appropriate for productivity.	Can help farm family members and rural workers move into skilled jobs	Important for farm family members and rural workers	Important for managing inter-generation change	
Investment in infrastructure	Helps with market integration	Helps improve local job opportunities		Can ease migration decisions for offspring	
R&D and extension	Public and private sector important; gains from adoption and adaptive research.	Can expand agricultural employment			
Labour market reforms		Important for raising employment opportunities and wage incomes			
Income transfers (possibly conditional cash transfers)				Conditional school attendance may complement investments in schools	Preferred policy for those unable to adjust.
Regional policies	Important for improving market integration	Expanded non-farm activity would raise farm wages	Important for building a diversified rural economy with wider job opportunities		
Develop producer associations	Reduce transaction costs and help exploit economies of scale	Indirect impacts			
Land policies and property rights	Need to encourage rental markets and facilitate land purchases by small farmers			Secure property rights and rental markets can ease exit decisions	

Improving the competitiveness of farm households

55. It is important to have a realistic view of which farmers have the potential to succeed commercially within the sector. In some regions agro-ecological conditions may be such that farming may not be inherently commercially viable. More generally, the appropriate adjustment pathway may depend on the basic type of farming system. For example, in East and Southern Africa the scope for agricultural

growth in areas where a mixed maize and cash crop system dominates is inherently stronger than the potential in areas where rainfed sorghum and millet combine with pastoral agriculture (Dixon *et al.*, 2001). Yet even when agro-ecological conditions are inherently favourable, the nature of structural change is such that farm operations tend to consolidate into fewer and more efficient enterprises, and some farmers will leave the sector.¹⁶

56. Given the need to acknowledge that some farmers will become competitive while others will not, and the impossibility of identifying exactly which farmers fall into each category, the main role for policy would appear to be in providing public investments that can improve competitiveness, but impose few distortions to incentives at the margin, for example in rural infrastructure, skills and training, and R&D.¹⁷ Such investments are unlikely to crowd out the development of other activities and potential income streams, although they are likely to accelerate the shakeout between more and less competitive farmers. Most of the relevant expenditures would need to be made at the economy-wide or sectoral level rather than in the form of payments to individuals. A further role for policy is when there are endemic market failures, for example in credit markets. Access to credit is important for smallholders, and private credit markets may find it not worth their while to engage with smallholders, simply because of their size and the difficulties of becoming informed about the creditworthiness of many small operations.

57. In many developing countries, farmers may have insecure land rights, while land rental markets function poorly or do not exist at all. Secure land rights can improve incentives for investment in the land, and can also facilitate the development of rental markets. The latter can in turn help compensate for market failures, provide flexible responses to economic and productive incentives, allow farmers to invest in farming capital, and help the poor and young gain access to land under conditions that are less demanding than those required to participate in land sales markets. Renting land may also be a first step to future land acquisition. The underdevelopment of rental markets may prevent the consolidation of land into more productive units, thus impeding agricultural investment and making it more difficult for uncompetitive farmers to diversify out of the sector. Finally producer associations and vertical co-ordination along the value chain may enable small farmers to benefit collectively from economies of scale.

Income diversification

58. Income diversification is essential for many farm households. For the poorest farm households, this is likely to provide some insurance and is in effect a “coping” strategy. For other farm households, having one or more family members draw income from outside agriculture may be the start of a successful move into more remunerative activities. Policies that support farm income alone, such as market price support, act as a disincentive for income diversification outside agriculture, and create an obstacle to one of the key “adjustment pathways”. The key policies required to help households diversify their income sources are again those that improve human capital. Regional development policies, including the development of rural infrastructure, may also have an important role.

16. Poulton and Wiggins (2005) present some evidence of declining farm sizes in developing countries, mostly for countries where the average farm size is a hectare or less. This is more likely to represent a fragmentation of operations, for example due to inheritance laws and property rights systems, than it is the relative efficiencies of small farms (*e.g.* ease of labour supervision; local knowledge) versus larger operations (knowledge of markets and technology; access to credit and inputs; ease of risk management; ability to assure quality).

17. There is evidence to suggest that improvements in agricultural productivity have a strong effect in reducing poverty (Irz *et al.*, 2001). There is also evidence that agricultural growth has helped support broader economic growth (for example, Tiffin and Irz, 2006), although agriculture’s role as a necessary driver of development has been questioned (Gardner and Tsakok, 2008).

Leaving the sector for skilled employment

59. Ultimately, the majority of smallholders in developing countries will have stronger prospects outside the agricultural sector than within it. The most important need, if not for this generation then for the next, would therefore appear to be investment in the education and skills that would enable households to obtain higher wages. At the same time well-defined property rights, especially with respect to land, are important for farmers to be able to cash in their assets, and exit the sector on favourable terms.

60. Regional development programmes, by targeting economic assistance to less developed regions, may also have a role in bringing jobs to people (rather than the other way round) and so can prevent the problems associated with mass migration into cities. However, rural policies are not fundamentally agricultural policies (nor vice versa). Regional policies can boost development within and outside agriculture, but without biasing household decisions about how best to invest for the future. Spending on infrastructure, and policies to encourage private investment, can also help balanced development, allowing the most profitable mix on agricultural and non-agricultural activities to emerge.

61. In many middle income countries the conditions of salaried agricultural work are at least as important as the development of small scale farm entrepreneurs. In Chile, for example, two-thirds of all households receiving the majority of their income from agricultural sources are salaried workers, not farmers. Labour market policies have an important role in ensuring that core standards of employment are met, while improved labour market flexibility has been suggested as a way of reducing informality (OECD, 2008).

Social policies for households that cannot adjust

62. Many poor households, notably older ones, face severe limitations in their adjustment potential, irrespective of the policies that are in place (for example, resource poor and post retirement age farmers). Hence there is always a need for social programmes. Investments in human capital (notably education) and measures such as contingent cash transfers can ensure that the next generation makes a quantum leap in terms of development. As noted previously, the potential difficulties of implementing such programmes in poor countries have led to market interventions such as input subsidies being proposed as a practical alternative.

Box 1. Thailand's agriculture: transition and sustained growth

The agricultural transformation

Since 1960 Thailand has transformed from agrarian country to an urbanised economy based around manufacturing. Agricultural output has grown more quickly than population, with two distinct periods of growth.

From the early 1960s to the early 1980s, agriculture grew by about 4% per year. It did so by opening up new lands for farming, and using more labour, to produce more of the main staples for both domestic market and for export. During this period, agriculture was a main driver of the economy. In 1980, more than 70% of the active population and most of the country's poor was employed in agriculture. The sector produced cheap food for the growing urban population and was a major export earner, with rice exports prominent. This was achieved despite taxation of the sector to fuel industrial growth. Rice exports were taxed directly and exporters were further penalised indirectly by over-valuation of the baht.

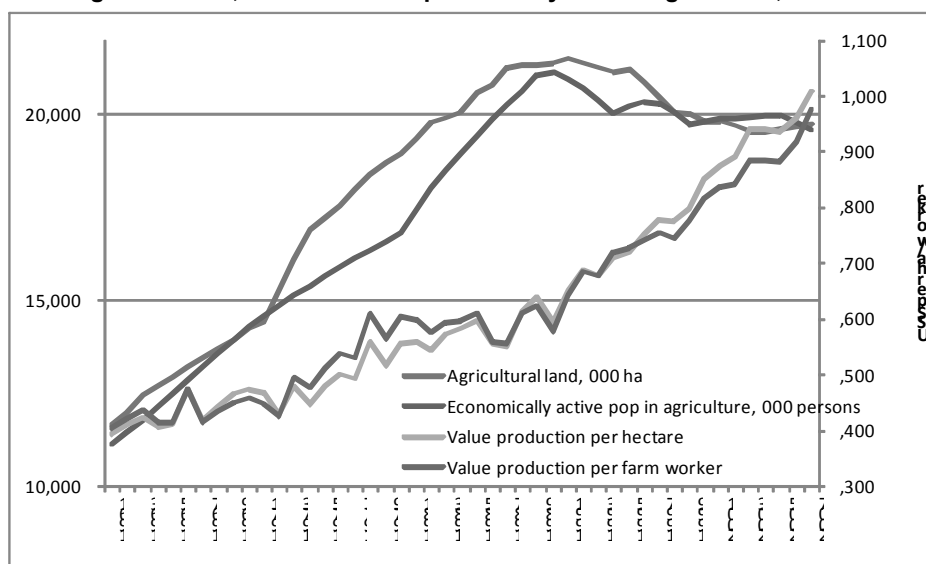
From the mid-1980s, agriculture began to transform. Labour left agriculture, attracted by jobs in manufacturing, urban services and the rural non-farm economy. At the same time, the land frontier was closing and it became harder to add new land. Consequently, agricultural growth slowed to about 2%–3% per year, although productivity increased notably. Given opportunities in both domestic and international markets, new activities emerged such as rubber, cassava, pineapples, and high value perishables for the fast-growing cities. Most farm households diversified their income sources, while some became more specialised in higher-value agricultural products sold into more sophisticated marketing chains. The rural non-farm economy has thus grown to the point where it now provides around half of all rural jobs. Successful industrialisation of the country has allowed direct and indirect net taxation of farming to be virtually eliminated.

In the early 1960s more than 60% of the rural population lived in poverty. By the early 2000s that had been cut to only a little more than 10%. From 1988 to 2007, the number of households affected by food poverty declined from 2.55 million to 418 000. With more abundant and cheaper staples, and reduced poverty, child malnutrition has also declined. The incidence of underweight young children fell from 17% in 1987 to 7% in 2006; while that of stunting was reduced from 25% to 16%. During the 1960s and 1970s, most of the improvements came from increasing farm incomes. Subsequently, incomes from rural non-farm jobs and remittances from migrants have become important. Not only has poverty fallen, but the reductions have been similar across the provinces.

The role of government policy

The Thai story is an example of a successful transition from an initial situation in which it was possible for agriculture to grow by putting underused factors of production to work, with only limited improvements in productivity, to a later stage where land and labour have become increasingly scarce and growth could only continue through improved returns to these scarce factors. Box Figure 1 shows how, from the late 1980s onwards, land and labour have started to leave farming, while productivity growth of these two factors has accelerated.

Box Figure 1. Land, labour use and productivity in Thai agriculture, 1961 to 2007



Source & Notes: Computed from FAOSTAT data. Agricultural land and economically active population in agriculture, left scale; value of production per hectare and per worker, right scale. Labour force in agriculture taken as the estimated economically active population in agriculture.

Success has been achieved primarily through private initiative, with the state playing a strategic role in setting an investment climate, investing in roads and research, and also supporting agricultural credit to overcome market failures. Specifically:

- The opening of new land was encouraged by tenure rules that allowed family farmers to clear enough land, 4 to 8 hectares, for a small farm and then gain secure property rights so long as they paid taxes.
- The state built roads that provided access to new lands and constructed irrigation works that were especially important before 1980 or so. Thereafter these investments were complemented by more spending on rural education, electrification, and telecommunications. Public investment in large-scale irrigation gave way to policies supporting private investment in smaller-scale irrigation.
- Public agricultural research has contributed as well. With intensification of Thai agriculture, uptake of agriculture research outputs has increased; as seen with modern rice varieties, use of improved rubber trees, and improved varieties for maize, soybean and cassava.
- To resolve failing rural credit markets, the Bank of Thailand instructed all commercial banks to allocate 5% of all commercial loans for agriculture at an interest rate lower than the market. The Bank for Agriculture and Agricultural Cooperatives (BAAC) has subsequently expanded provision of agricultural credit to 90% of farm households and all farm co-operatives, using a group liability guarantee which enables small farmers to access short-term credit without land title deeds as collateral.
- More recently the state has promoted certification to allow farmers to develop premium domestic markets.
- Government has sought to promote agricultural exports through active participation in trade talks, in multilateral, regional and bilateral negotiations.
- Although agriculture was taxed heavily in the early stages of industrialisation, the state had the wisdom to ease this subsequently, once manufacturing was not so dependent on farming for resources.

Source: Material provided to OECD by Leturque & Wiggins, 2010.

63. Note that the identification of a role for government intervention in agricultural markets, either to boost long-term competitiveness or to protect incomes over the short term (*i.e.* provide a safety net), hinges on the argument that such interventions provide practical alternatives that are likely to be more effective than theoretically ideal instruments. These arguments are investigated for price stabilisation and input subsidies in the following sections.

5. Market stabilisation policies

64. Interest in market stabilisation policies has revived following the 2007-08 food price spike. A large number of developing countries responded to the crisis by seeking to stabilise domestic markets and thereby isolate their consumers from events in world grain markets (Abbott, 2009; Demeke *et al.*, 2008; Jones and Kwiecinski, 2010). Trade policy actions included tariff reductions as well as restrictions on exports via taxes, quantitative restrictions or outright bans. Domestic measures – such as tax cuts on food, subsidies and releases of stocks – were also employed, in order to limit the transmission of world price shocks onto domestic markets.

65. Many of these actions ran counter to the basic principles that OECD has established for its member countries, which emphasise a dual strategy of (i) correcting market failures, so that private markets can provide risk management and, and (ii) providing effective social safety nets, so that there is no need for market intervention and associated trade protection (OECD, 2002). In most developing countries, the mechanisms were not in place for such an approach to provide a sufficient response to the price crisis, at least over the time frame in which policy makers needed to respond. However, the stabilisation of domestic markets further raised prices on international markets, exacerbating instability and creating difficulties for some countries dependent on imports. It also threatened to impede supply responses, and thereby exacerbate problems that governments had intended to solve.

66. Any consideration of the role for government policy in managing market risk needs to distinguish international (exogenous) risk from domestic risk, and take account of the extent to which the former is addressed at the international level.¹⁸ Historically, domestic sources of instability (principally production variability) have tended to dominate international sources of instability (reflected in world price movements) (Hazell *et al.*, 2005). This being the case, trade openness, and efforts to improve internal price transmission, were recommended as ways of providing greater market stability. Some analysts, however, have suggested that the 2007-08 price crisis marks the beginning of a new period of greater world market instability (for example Galtier, 2009). Abbott (2010) suggests that it makes sense to prepare for periods of low and stable prices punctuated by episodes of high and volatile prices, such as were experienced not just in 2007-08, but also in the 1970s and, to a lesser extent, the mid-1990s.

67. In considering the role for domestic policy, it is helpful to start with the basic objectives of policies to manage market risk. In the short-term, these include protecting the real incomes of consumers or producers, and containing the impacts of instability on poverty and hunger. In the longer term, greater market stability can provide a more stable environment for investment decisions and make a contribution to macroeconomic stability. In recognising these objectives, it becomes clear that the underlying rationale is not to manage markets or prices *per se*. More appropriate target variables are incomes or consumption (or other measures of welfare) over the short and long term.¹⁹ With respect to this objective, there is a role for policy in correcting or offsetting market failures in private risk management, and (in the absence of alternative safety nets) redistributing income to the poor.

68. OECD's work on risk management has identified three layers of risk at the farm and national level (OECD, 2009). First is a "risk retention layer", corresponding to risk that can be effectively managed by farmers and households themselves. Second is an "insurance layer," which can be addressed by private markets instruments such as crop insurance or forward pricing. Third is a "market failure layer", where intervention may be required. In developing countries, weaker institutions are likely to mean that a wider range of risk falls within the market failure layer, implying a greater need for government action.

69. Market failures stem from missing or incomplete markets for storage, insurance, futures contracts or credit. These market failures may in turn derive from underdevelopment of infrastructure and institutions (including market information and a functioning legal framework). Ideal best practice is to address those market failures directly rather than offset their impacts by stabilising markets.

70. Domestic market risk arises principally from production variability. In a fully open market, with low transport and transaction costs, price variations due to domestic factors should be eliminated by international trade, implying no need for stocks or a stocks policy. But in poor countries, price transmission is imperfect, market information may be imperfect and imports may not arrive quickly enough to arbitrage between domestic and international prices. Instead, prices are typically lower after a harvest and rise until the next harvest, when they fall again. This movement of prices over time creates an incentive to store, which will reduce inter-seasonal price variability. Similarly, expectations of a poor harvest provide an incentive to carry stocks over from one season to the next, which will reduce inter-annual variability. Thus, there are two key roles for policy: (i) to lower costs and improve the efficiency of the domestic storage systems, and thereby reduce both inter-annual and inter-seasonal price variability; and (ii) to undertake investments and reforms that improve market integration (*i.e.* price transmission across domestic and international markets).

18. Several proposals were made in the wake of the food price crisis including the greater use of futures markets by developing countries; the establishment of an international clearing house to ensure contracts are honoured in world markets and supplies are reliable (Sarris, 2009); and the creation of an international virtual reserves scheme (Von Braun and Torero, 2009).

19. Newberry and Stiglitz (1981) showed circumstances under which stabilising prices can destabilise income.

71. In developing country efforts to address market failures are necessary but are unlikely to be sufficient or timely. Futures markets have seldom been used by farmers, being more appropriate for traders, while the adoption of private crop insurance has been limited by the standard problems of extending access to small farmers (moral hazard and adverse selection) as well as the particular difficulties of reaching poor farmers in developing countries (including poor price information). In earlier decades, pan-seasonal and pan-territorial pricing, often implemented by marketing boards, were used to offset (as opposed to eliminate) these market failures. These involved intervention in the market failure and insurance layers of risk, and undermined incentives in the risk retention layer.

72. Most assessments have concluded that these arrangements performed poorly. First, they were ineffective at stabilising income, being focused on the wrong variable. Second, state-run markets proved to be inefficient and costly, particularly as they were often not just stabilising incomes, but subsidising specific interest groups. On the other hand, following privatisation, some of the functions that state traders undertook were not replaced or remained inefficient, including the provision of public goods in the areas of research and extension, disease protection and market information; and overcoming missing markets for credit and inputs. Timmer (2002) and Cummings and Gulati (2009) have argued that these arrangements were effective at stabilisation in Asia, albeit at a high cost. Timmer has also emphasised macroeconomic spill-overs from price stabilisation, citing Indonesia as an example of a country that gained a greater degree of macroeconomic stability.

73. The World Bank has provided a set of best practices for risk management and stabilisation policy, which stress the need to improve agricultural productivity, to promote diversification among crops and income sources, and to provide long run investments that allow the private sector to better cope with meeting food needs of the population (Byerlee, Jayne and Myers, 2005). Investments in irrigation, drought tolerant varieties and cropping mix strategies, are seen as ways of reducing output volatility while increasing production. Further recommendations are to develop institutions, infrastructure, market information, regulation and co-ordination, legal mechanisms (e.g. warehouse receipts), and specific private market based risk measures. The primary emphasis is on ensuring long run food availability, and reducing domestic risk, rather than coping with external shocks such as the 2007-08 price spikes. A liberal trade policy is foreseen, with direct interventions in food markets to manage price risk a last resort, and cash transfers or food aid the preferred safety nets.

74. Improved private domestic risk management institutions will facilitate better stocks management and make it easier to rely on trade as a mechanism for smoothing domestic prices. Early warning of both domestic production shortfalls and world price trends is also needed if there is to be a greater reliance on trade. In less developed countries, imperfect legal frameworks, weak market information systems, and weak financial institutions impede the development of commercial stocks, as well as the ability of trade or stocks strategies to protect domestic consumers. Stocks need not be publicly held if consistent and transparent rules govern stocks management, although there may be a need for the state to hold emergency stocks. Better private institutions mean smaller stocks and more effective interventions.

75. More direct interventions have also been proposed, on the grounds that investments in best practice take time to pay off, may be difficult to foster in smaller economies (because of inherent economies of scale), and may not provide a credible response to events such as the 2007-08 price spike. These include rules-based intervention such as stock schemes, variable levies, price bands and, as well as *ad hoc* or discretionary interventions of various kinds.

76. In general, one would expect to observe countries using trade policy or stocks policy to stabilise market, but not both. This is because if one is effective the other should not be. Trade policy is likely to be more effective when domestic markets are integrated with world markets; stocks policy when they are not.

However, Abbott *et al.* (1998) found that many developing countries use both in order to maintain consumption in the face of domestic production variability.

77. If price spikes are infrequent, then there are high opportunity costs in carrying large stocks from one year to the next. An alternative is to guarantee import financing, as the European Union and the IMF have done in the past. However, these facilities were seldom used, as the conditions were stringent and high import food costs did not always coincide with a dearth of foreign exchange.

78. Measures such as pan-seasonal pricing and variable levies eliminate price risk altogether and with it the incentive for private agents to hold stocks or adopt their own risk management strategies. Price band schemes, on the other hand, can be used to protect against extreme price movements, but are illegal under the 1995 WTO Uruguay Round Agreement on Agriculture. Such a scheme was adopted by Chile for wheat and sugar, more from a concern to protect producers from low prices than to address higher prices. However, this scheme was dismantled in order to comply with a WTO ruling in 2007. The advantage of a variable levy over a stocks policy is that holding and transaction costs need not be borne in normal years. However, if the base level of protection is low, reducing the tariff to zero may not be effective in containing upward price shocks. Price bands could also be vulnerable to speculative attacks. For example, if a subsidy is needed to maintain the domestic price below the imported c.i.f. price, domestic traders may be able to test the financial constraints of the government.

79. *Ad hoc* or discretionary interventions seem like a sensible approach to dealing with rare and extreme price shocks. If they are interpreted by those benefiting to be one-off actions, then they are less likely to induce moral hazard (*i.e.* deter agents from managing their own risk) than rules based approaches. However, Jayne and Tschirley (2009) provide examples of how, in Africa, such an approach has induced strategic behaviour and aggravated price shocks. In some cases, traders, faced with rising prices, have anticipated that the government will waive tariffs and delayed their imports, thus causing prices to rise further. This was the case in Zambia in 2005/06, and in Kenya in 2003/04 and 2008/09. Alternatively, a shortfall in national food production has been anticipated, so the state has announced plans to import, which has caused private traders to wait. The state has then incurred delays in contracting and prices have risen further. This happened in Zambia in 2001/02 and 2002/03, and in Malawi in 2001.02 and 2005/06. The third failure has been when an adequate harvest has been incorrectly predicted, so there has been no granting of import licences. Supplies have subsequently been lower than expected, which has led to hoarding and trader manipulation, with prices again rising sharply. This occurred in Malawi and Zambia in 2008/09.

80. Notwithstanding these drawbacks, market stabilisation can meet political objectives and can avoid catastrophic outcomes (albeit if, when markets are integrated, the problem is exported). The primary need is to focus on reducing the need for these instruments by correcting market failures as far as possible and ensuring that the financial resources are available to address unacceptable welfare (income) outcomes on clearly identified constituencies.

6. Input subsidies

81. Input subsidies have been suggested as a way of increasing agricultural production and thereby reducing poverty and improving food security. There has been a particular revival of interest in Africa, where sectoral performance has been relatively poor. The diagnosis has been as follows (see Wiggins and Brooks (2011) for supporting data). Food production in Africa has grown much more slowly than in Asia and Latin America. This has resulted in rising of cereals and other staples, and more people who are hungry and undernourished. Yields of staples have barely risen, largely since farmers have not applied fertiliser in sufficient amounts to take advantage of improved varieties. Farmers have not done so because inputs have been too costly and they have been too poor, with little or no access to credit. In order to break

this impasse, it has been argued that it is necessary to subsidise the costs of inputs, thus creating a virtuous circle of higher yields, higher incomes, more food, and less hunger and poverty. Allied to this is the perception that a new generation of “smart” subsidies, such as those applied in Malawi, have managed to unlock this potential.

82. Politically, subsidies are a highly visible gesture to rural voters, as well as potentially also being an instrument of patronage. Yet perhaps the greatest attraction lies in the apparent simplicity of a single measure, a subsidy, to meet a wide range of economic, social and political objectives.

83. The broad argument that input subsidies can lead to higher incomes, reduced poverty and improved food security is based on specific claims with respect to a range of underlying objectives. Most of these underlying objectives have either an economic efficiency rationale (*i.e.* reflect a market failure of some kind), or are concerned with reallocating income to a particular constituency (for reasons of social equity or political patronage). The main economic objectives are:

- 1) Stimulate agricultural production.
- 2) Compensate for high costs of transport from port or factory to farms that raise costs of inputs.
- 3) Improve soil quality and combat soil degradation (in the case of fertiliser).
- 4) Offset high costs of supplying inputs when markets have low volumes and economies of scale in logistics cannot be achieved.
- 5) Make inputs affordable to farmers who cannot buy them, owing to poverty, lack of access to credit, and inability to insure against crop losses.
- 6) Learning — to allow farmers to try novel inputs and become familiar with their advantages.

Further objectives are:

- 7) Social equity – to transfer income to farmers who are poor, live in remote disadvantaged areas, or both.

In practice it may be difficult to disentangle these objectives, particularly the social one, from the implicit motive of political patronage – to win favour with voters and reward supporters.

84. Raising the level of output (objective 1) is not in itself an efficiency issue. However, this objective reflects the notion that output may be less than optimal because of underlying market failures, for example the sub-optimal use of inputs, and the possibility that higher output could lead to external economies of scale (a “thickening of markets”). The benefits of using input subsidies need to be compared with the costs of tackling those market failures directly.

85. The same goes for objectives 2 and 3. The optimal way of offsetting high transport costs is to invest in infrastructure. Similarly, while applying more fertiliser can raise soil fertility and prevent soil degradation, there are other ways of doing this that may be more effective and economical, such as terracing to prevent soil erosion. Moreover, too much application of fertiliser can lead to environmental degradation.

86. Arguments four and five are central to current debates: these aims are about correcting market failures affecting input supply, finance and insurance. One set of failures (objective 4) arises in the supply chain. When potential input dealers know too little about the demand for inputs, and suspect that demand

may be low, they will not stock them. What little stock they may carry then has a high mark-up to cover both the risk of not being sold as well as high unit costs for transport and storage of small lots, since scale economies are not achieved. Another set of failures (objective 5) affects farmers. They lack the cash to buy inputs early in the crop season and cannot obtain credit. Banks or input dealers will not offer credit if they do not know enough about the competence and character of farmers seeking loans, or will only do so if they can get collateral and character references — requirements that many small farmers cannot meet. Farmers, moreover, may be reluctant to accept the risk of credit in any case, since they would be unable to repay the loan if the harvest fails. Formal insurance policies are usually absent in rural Africa, since would-be insurers face similar problems to the bankers: the underlying risks are difficult to calculate, the character of farmers is unknown. Offering them insurance would be foolhardy without this information.

87. If market failures are severe, farmers could become locked into low levels of productivity, even when the technology and economic opportunity exist, since they cannot access and afford the seeds and inputs to take advantage; and thus they remain trapped in poverty, too poor to work themselves out of this condition (Dorward *et al.* 2004, Duclos & O’Connell 2008). If this applies to many farmers, as it may in some countries where the majority of rural households are poor, then a household poverty trap becomes a major drag on national economic growth as well. It is not then surprising that there have been calls for governments to intervene to correct the failures, if necessary by subsidising costs — and if necessary by providing inputs directly to farmers. A lively current debate in Africa turns on how widespread and severe are these rural market failures; and whether there are other ways of remedying them than input subsidies.

88. Reason number six, on learning, is another form of market failure. Farmer demand for improved inputs may be low simply because they have too little experience of their advantages. There is a strong case for a subsidy in such cases, but since farmers can try out inputs and assess their advantages within a couple of seasons, a subsidy on these grounds would be short-lived. Moreover, since farmers tend to try out new ideas on limited areas, the subsidy need only cover a small amount of seed, fertiliser, chemical, etc. per farmer: there is no need to grant a blanket subsidy in such cases. It is thus not surprising that a common alternative to a subsidy for learning is to distribute, free, starter packs with improved seed and fertiliser sufficient to plant an acre or less.

89. Finally, argument seven, the use of input subsidies to transfer income to poor farmers or those disadvantaged by location needs to be set against the effectiveness and economy of doing the same by direct payments,²⁰ food aid distribution, or employment programmes paid in cash or kind.

90. For all of the market failure (efficiency) reasons commonly cited for subsidising inputs, there are theoretically superior ways of achieving the same objective. Similarly, input subsidies are not the optimal way of transferring incomes to a target constituency. The arguments therefore come down to the relative cost-effectiveness of different instruments and practicalities of implementation. In this respect, it is important to consider the disadvantages and drawbacks associated with input subsidies.

91. Arguments against subsidies include the following:

- 1) Subsidies may be ineffective in raising use of inputs and increasing yields. It is not always the case that the volume of inputs applied is sensitive to price. Studies in Sri Lanka (see below), for example, report low elasticities of fertiliser application with respect to its own price: instead the volume of fertiliser applied corresponds more closely to the area under irrigated rice and to the price of rice. The corollary in these cases is that much of the subsidised fertiliser merely displaces fertiliser that would have been bought without the subsidy.

20. Cash transfers may be conditional on the clients sending children to school, or on mothers attending primary health care clinics with infants.

- 2) Heavy subsidies on inputs potentially distort the relative costs of factors, leading to inefficient allocation of inputs, with the subsidised inputs substituted for other factors. This applies particularly where inputs are substitutes, rather than cases where they are complementary. The most often cited case for agriculture is that of farm machinery, where capital grants and tax exemptions for tractors and harvesters lead to farmers using machinery to displace day labourers — in places where there are many landless looking for work. Fertiliser is typically thought of as a complementary input, but there may be cases in which it is a substitute.²¹
- 3) Subsidies intended to benefit specified groups of farmers, or to stimulate particular crops, may be less effective than intended as leakages occur. For example:
 - When farm profits rise, landlords may be able to raise land rents and thus effectively appropriate the value of the subsidy. The degree of this leakage depends on the extent to which farmers rent rather than own land (or have otherwise secured land rights), and the extent to which the price of land is bid up. The analysis in Section 2 suggests that this may be significant, but less important than in many developed OECD countries.
 - When subsidy programmes allow discretion to local officials and field workers in allocating subsidies inputs, there is the danger that they will use their power to extract bribes.
 - The same local discretion may be used to divert subsidised inputs from intended beneficiaries to others, such as local elites and political supporters. In some cases this arises since field workers have different priorities to policy-makers. For example, in Malawi some field staff reportedly prefer to allocate subsidy vouchers to farmers they consider most likely to make good use of the input, rather than those who cannot afford fertiliser at commercial prices (Dorward and Chirwa, 2011).
 - When subsidised inputs are intended for use on a particular crop — often food, they may be switched to higher value cash crops. For example, some of the subsidised fertiliser in Sri Lanka intended for rice is reportedly diverted to vegetable production. This may not be a problem in economic terms, but it subverts the intended objective, which in the case of Sri Lanka is greater self-sufficiency in rice.
- 4) Subsidy programmes may be implemented in ways that repress the development of private supply of inputs, by delivering inputs through state agencies and bypassing nascent local input dealers.
- 5) When subsidised inputs dominate the supply of a particular input, then subsidies may become closely linked to government budget cycles, or to electoral cycles with pronounced swings in availability; so that supplies whether or not they are subsidised, may not be regular, reliable and timely.
- 6) All this said, often the main objection to subsidies is their high cost. In the three cases outlined below of India, Malawi and Sri Lanka, input subsidies have taken up 10%, 15% or more of the total government budget — sometimes more than what the government spends on education. When state agencies are used to distribute subsidised inputs, there may little incentive for them to economise on logistics.

What is more, the cost of subsidies can rise if:

- the subsidy is effective in encouraging greater use of inputs;

21. For example, women farmers in Swaziland have been seen to substitute fertiliser for weeding: they are chronically short of labour, but have remittances from their miner husbands in South Africa, and hence it makes sense to push up yields with fertiliser even as yields are depressed by weeds.

- policy makers are tempted use the subsidy as a way to stabilise input prices, so that when the cost of inputs rises, the subsidy is used to maintain the same nominal cost to producers;
- subsidised inputs are smuggled across borders to neighbouring countries where inputs are more expensive (a problem if the subsidy is not rationed or otherwise limited); and, if
- political competition for rural votes leads parties to make election pledges to increase subsidies.

7) Once in place, subsidies can be difficult to remove. They can be seen as a political signal of support to farmers, around which farmers sometimes form electorally powerful lobbies for their continuation.

92. How do these benefits and costs weigh up? Evidence from case studies of India, Malawi and Sri Lanka suggests that subsidies have had an impact over the short to medium term, promoting input use, raising output and thus reducing poverty. The programmes have been costly, although the absence of a counter-factual makes it difficult to evaluate whether the same benefits could have been achieved at a lower cost with alternative instruments. It is also possible that, because of high budgetary costs, the pursuit of other objectives, for example in the areas of health and education, has been compromised.

93. A further question is whether the benefits have been enduring? In other words, have the subsidies propped up incomes temporarily or led to a sustained increase in incomes that would survive removal of the subsidy? Experience from India is that there were early returns during the Green Revolution, but the subsidies became increasingly ineffective as they were not complemented by deeper investments to improve agricultural productivity and strengthen the rural economy. Hence there was relatively weak progress in facilitating the agricultural transformation and raising rural incomes. In general, for subsidies to have had any long-term effect, they have required complementary investments to make input use profitable, for example in rural roads, agricultural research and extension, and in some cases irrigation. Indeed, the extent of adoption of high-yielding varieties and use of irrigation may have more influence on the amount of fertiliser used than the price of fertiliser. There is also evidence that the benefits of input subsidies are higher in the early stages of provision, as farmers increase their use of external inputs from a low base. They are markedly lower once a certain level of use has been achieved, agricultural production is greater and markets have become wider. Furthermore, the tendency is for costs to rise, for the subsidies to increasingly displace government spending in other areas, and for them to become a source of income transfer from which the government has difficulty extracting itself. Hence they can pass from being a help to becoming a hindrance to agricultural development.

94. The effectiveness of input subsidies will depend on specific market conditions and the way in which the subsidy programme is implemented.²² Evidence from Sri Lanka suggests that fertiliser use might not be sensitive to price (in which case the subsidy simply replaces commercial sales). An open-ended subsidy is also favours larger producers, making it a poor instrument for tackling poverty. Effectiveness may also be constrained by design features. For example, the state's distribution of vouchers in Malawi has led to a diminished role for private dealers. On the other hand, there is evidence from Kenya to suggest that indexation of the subsidy, with the value of the subsidy declining gradually over time, can lead to the replacement of state action with private markets.

22. See background paper for a discussion of implementation issues, including alternative approaches to targeting (including rationing), the conditions under which a subsidy should be provided, the point at which the subsidy should be provided, the means of provision (including vouchers) and the time frame over which the subsidy should be in operation.

95. Input subsidies need to be contemplated with caution, with a clear consideration of the costs and benefits compared with conventional best practice of addressing market failures directly and using social policies to address social objectives with respect to poverty and food insecurity. The technology transfer (“learning”) argument is one that corresponds to this best practice advice, because of its public good aspect. However, this calls for a relatively small, time-bound subsidy. What is being proposed, particularly in Africa, is intervention on a much larger scale and for a longer duration, in order to address the specific circumstances of countries at a low level of economic development

96. If input subsidies are to be used more extensively, then there are important lessons that need to be absorbed. These lessons are reflected in the principles for “smart” subsidies, espoused by the World Bank and others. Subsidies should be:

- **Targeted** to those farmers for whom inputs may be otherwise unaffordable — for example, poor farmers, farmers in remote areas;
- **Work with the market** to help develop commercially viable supply chains — for example, by giving farmers vouchers that they can redeem from input dealers; and,
- **Limited in time**, until the market failures that justified the subsidy have been overcome.

97. Above all, the rationale for using a subsidy needs to be kept clear. Despite the attraction, there is a fundamental difficulty in using a single instrument to address multiple market failure (*i.e.* long-term development) and social objectives. If the aim is to reduce market failures, then there need to be an exit strategy for when that objective has been accomplished, as noted above. But that in turn means planning for alternative ways of addressing social objectives, ideally by putting social safety nets in place. This conflict has become a clear problem in India and Sri Lanka, where programmes have outlived their original rationale and become a budgetary millstone.

98. Finally, as far as possible, the use of input subsidies should not crowd out spending in other important areas, or compromise a long term approach of eliminating market failures – as opposed to offsetting them – and getting private markets working.

7. Policy conclusions

99. Income growth is essential for progress on the first Millennium Development Goal (MDG1), which calls for the eradication of extreme poverty and hunger, with specific targets that include halving between 1990 and 2015 the proportion of people living on less than a dollar a day and the proportion of hungry. The MDG1 deadline calls for policies that can be effective quickly, *i.e.* over the short to medium term in which basic economic structures are essentially fixed.

100. One priority is to strengthen systems of social protection, the other is to raise the basic incomes of the poor. Since two-thirds of the world’s dollar-a-day poor live in rural areas, where farming is a core economic activity, this implies raising economic returns within agriculture. Under-investment in agriculture has been identified as a key reason for weak economic performance among poorer countries, notably in Sub-Saharan Africa (World Bank *World Development Report* 2008).

101. However, government policy cannot focus exclusively on agriculture-led development. In the longer term, there is a need to take account of the structural changes in agriculture that accompany successful economic development. These include a declining share of agriculture in GDP as the economy develops and diversifies; a release of labour from the sector driven by the “push” of labour-saving technical change in agriculture and the “pull” of growing labour demand in non-agricultural sectors; and, despite the release of resources, rising agricultural output.

102. Recognising that successful agricultural development is associated with adjustment pressures, policy needs to focus on improving economic opportunities for farmers outside the sector as well as within it. This study proposes a strategic framework for strengthening rural incomes that emphasises three development pathways for farm households: improving productivity and competitiveness within the agricultural sector; diversifying income sources among household members; and, finally, leaving the sector for better paid jobs. This leaves an important role for social policies in addressing the needs of those unable to adjust within the current generation.

103. This approach is relevant for countries at all stages of development, even if the balance of opportunities within and outside agriculture may vary. Smallholder farming dominates agriculture in most poor countries, and there may be improving opportunities for smallholders to establish commercially viable operations. Yet exploitation of those opportunities will imply some less productive smallholders moving on to other, ultimately more remunerative, activities. Such a pattern of development is evident from the successful transformations witnessed in Thailand and Vietnam, among others.

104. Many of the policies required to improve farmers' opportunities are non-agricultural. Improvements in education and primary healthcare are key to prospects within and outside the sector. Equally important is the overall investment climate, which depends on factors such as peace and political stability, sound macroeconomic management, developed institutions, and governance. In agriculture-dependent economies, there is a strong case for increasing the share of public spending allocated to sector-specific public goods, such as rural roads and agricultural research. Public investments may be effective in helping farmers become more integrated with vertical supply chains. There is also a need to situate agricultural policies among broader rural development policies, in order to facilitate balanced economic development in rural areas and avoid unwanted mass migration to the cities. Secure land rights provide farmers with an incentive to invest in their land, but also the possibility to rent or sell, and thereby diversify their incomes sources or leave farming under favourable terms. In each case, efforts to raise incomes need to be reconciled with other policy objectives, such as protecting the environment and ensuring the sustainability of agricultural production.

105. In terms of public spending, the choices are not always straightforward. There may be complementarities, for example between agricultural extension and the development of infrastructure and broader investments in human capital. There may equally be trade-offs, for example between investments in rural roads versus spending on health and education programmes. For many countries, there is a need to improve the analytical basis on which such decisions are made.

106. Such a strategic orientation is consistent with a twin-track approach for agricultural policies, as recommended for OECD countries (OECD, 2002). Specifically, governments can use targeted social programmes instead of agricultural policies to address immediate concerns about the level and distribution of income, while promoting sustained income growth by reducing market failures, ideally by tackling them at source, and by providing public goods, such as agricultural research and rural infrastructure. OECD analysis has found that, if the objective is to raise farmers' incomes, then market distorting instruments, such as price supports and input subsidies, are a poor alternative, because the induced increase in the demand for land and other inputs leads to a large share of the benefits leaking to non-farm landlord and suppliers of purchased inputs (OECD, 2001). Analysis using DEVPEM suggests that such leakages may be less of a problem in poorer countries because farmers tend to supply more of their own factors, purchasing few inputs. On the other hand, price support for staples is likely to be problematic because many, if not a majority, of poor farm households are net buyers of food. Furthermore, price policies and input subsidies are still found to be less efficient at transferring income than economy-wide social programmes, including cash transfers, which can be targeted to the poor.

107. In developing countries, it has nevertheless been argued that this “best practice” policy advice may need to be qualified. The first argument is that it may not be possible to implement standard social programmes. A possible reason is that necessary institutions and infrastructure, such as an information base on which to establish criteria of eligibility, may not exist. This has led to alternative policies being proposed, such as price stabilisation, which provides an operationally simpler way of mitigating the impacts of price shocks on poor households than to market-based forms of risk management or the provision of income safety nets. The second argument is that market failures are likely to be more widespread than in developed countries, with many markets missing altogether, and it may not be possible to address the root causes directly. For example, farmers may have low incomes partly because they have no access to credit. Hence, input subsidies have been suggested as a practical solution to the otherwise difficult problem of developing input markets and providing financial services to small farmers.

108. Over the long-term, however, market interventions treat the symptoms of market failure and underdevelopment, rather than the causes. Price stabilisation can provide a more stable investment climate, but deters private risk management and may export instability onto world markets. Input subsidies can redress failings such as the under-development of infrastructure, missing markets for credit and inputs, and a lack of knowledge of the benefits of using improved seed and fertiliser, but can impede the development of private markets. In both cases, the benefits and costs of intervention need to be judged relative to the benefits and costs of tackling the underlying problems directly.

109. An attraction of using price policies and input subsidies is that in each case a single policy lever can seemingly address multiple objectives. Yet there is a basic incompatibility. If the objective is one of redressing market failure and under-development, then there needs to be an exit strategy, with intervention being phased out once the underlying problems have been addressed. But that in turn means moving towards economy-wide social safety nets. The appeal to both market failure and social objectives has led to programmes becoming a budgetary millstone: no longer addressing the market failure that prompted their use in the first place (in fact becoming counter-productive) and developing into a source of income transfers from which the government cannot exit.

110. Thus, while there may be plausible reasons for intervening in markets in poorer economies, such actions need to be contemplated with caution. The scale of intervention may be more important than the simple decision on whether or not to intervene. An important priority is that expenditures on market interventions should not crowd out essential investments in support of long-term agricultural development.

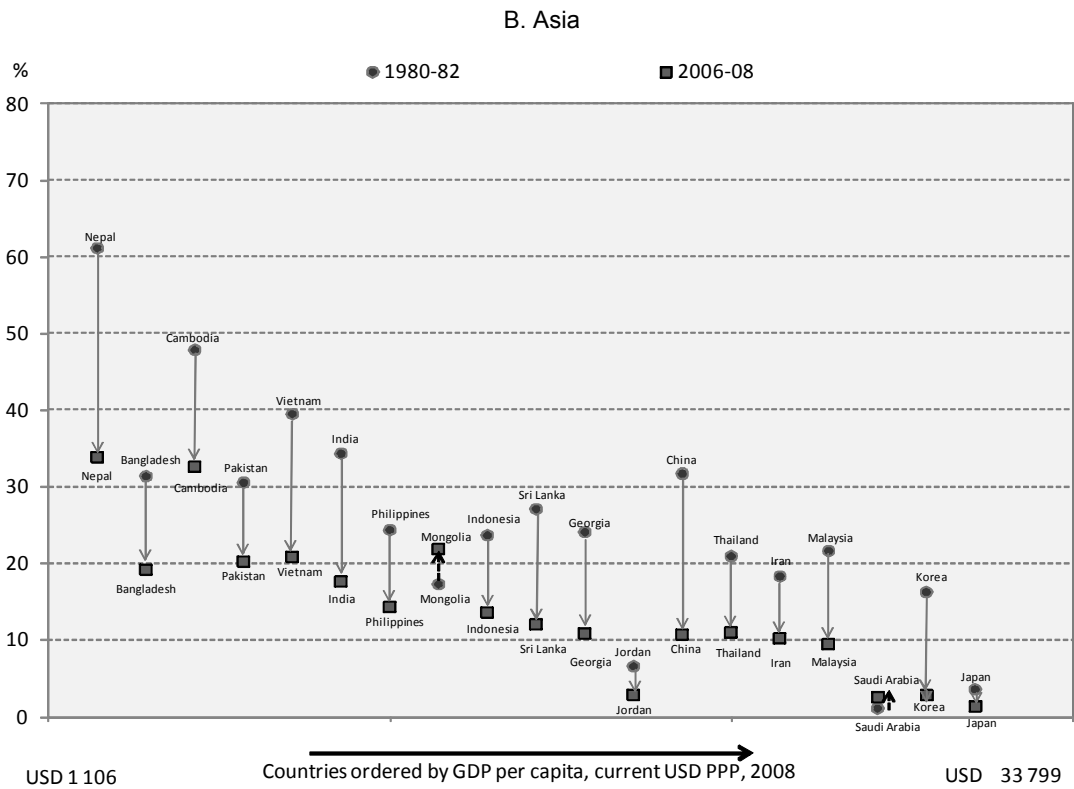
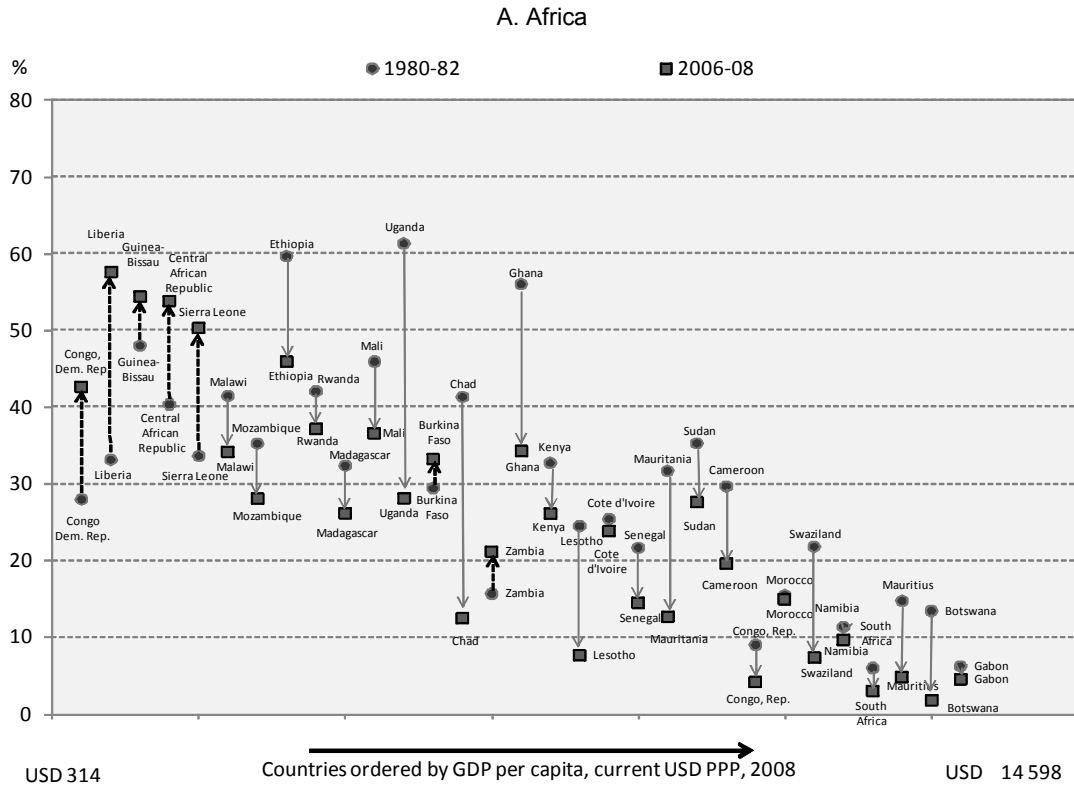
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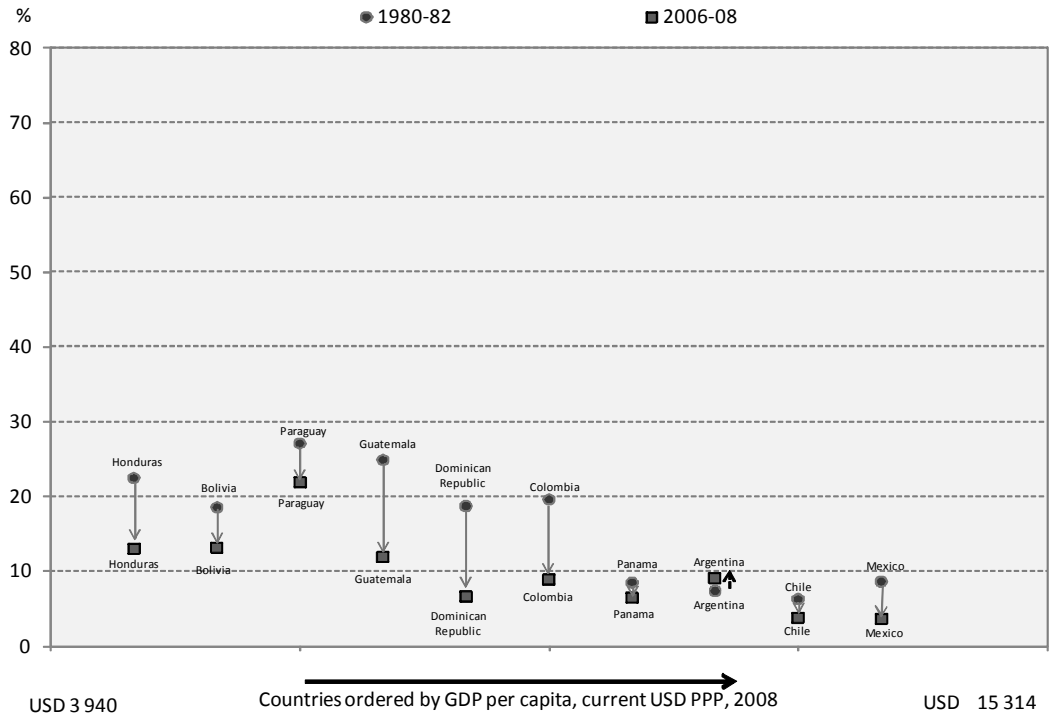
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Annex Figure 1. Evolution of agriculture's share of GDP in Africa, Asia and Latin America, 1980-82 to 2006-08



C. Latin America



Source: World Bank World Development Indicators (2010).