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Agricultural growth has long been recognized as an important instrument for poverty reduction. Yet, measurements of this relationship are still scarce and not always reliable. The authors present additional evidence at both the sectoral and household levels based on recent data. Results show that rural poverty reduction has been associated with growth in yields and in agricultural labor productivity, but that this relation varies sharply across regional contexts. GDP growth originating in agriculture induces income growth among the 40 percent poorest, which is on the order of three times larger than growth originating in the rest of the economy. The power of agriculture comes not only from its direct poverty reduction effect but also from its potentially strong growth linkage effects on the rest of the economy. Decomposing the aggregate decline in poverty into a rural contribution, an urban contribution, and a population shift component shows that rural areas contributed more than half the observed aggregate decline in poverty. Finally, using the example of Vietnam, the authors show that rapid growth in agriculture has opened pathways out of poverty for farming households. While the effectiveness of agricultural growth in reducing poverty is well established, the effectiveness of public investment in inducing agricultural growth is still incomplete and conditional on context. JEL codes: O13, 131

Poverty reduction can be achieved through two instruments: transfers and pro-poor growth. Transfers require foreign aid or taxation of the incomes accruing to the non-poor and distribution through a variety of social programs. It has been widely used, especially in dealing with emergencies or to achieve quick poverty reduction results, and to address poverty among categories of the population that could not generate autonomous incomes even under the best of circumstances. It has the appeal of relative ease of implementation compared to promoting autonomous income growth of the poor. Sustained poverty reduction through
redistribution is, however, politically difficult to implement, particularly when poverty is a mass phenomenon, as it is in most developing countries. It can be hugely expensive if it has to be sustained year after year to reduce poverty significantly. And it is not a dignified way of dealing with poverty when the poor have the capacity to generate autonomous incomes, if they are given the chance. For this reason, pro-poor growth, that is growth that benefits the poor, is the better alternative to poverty reduction for those who can work. This, however, raises the question of identifying the pathways through which growth helps reduce poverty, not surprisingly one of the most fundamental topics in development economics.

For producers, how growth helps reduce poverty depends on access to assets and on how they are able to use these assets for income generation. For rural workers, it depends on the ability to link to expanding employment opportunities in good jobs in agriculture and the rural non-farm economy. As shown by Lipton (1991), the Green Revolution in Asia increased land productivity faster than labor productivity, with the result that agriculture was able to absorb more labor and help reduce poverty. For consumers, if agriculture is incompletely tradable, growth in food production can help lower the domestic prices of consumption goods and raise real incomes. This will benefit the urban poor, landless rural workers, and the many poor net-buyers among smallholders. Recent estimates show that a majority of smallholders are in fact net buyers, benefiting more from a decline than from a rise in the price of food. The main long-run effect of growth in cereal yields on poverty reduction in India, in a context of non-tradability, was through a decline in the price of food (Datt and Ravallion 1998).

Conditions are changing, however. With increasing tradability of agriculture, productivity gains in agriculture will be transmitted increasingly less via lower food prices, and increasingly more through higher employment and wages (Valdés and Foster 2007). Growth can thus offer a multiplicity of pathways out of poverty. These pathways depend on the sector where growth occurs, broadly agriculture, industry, or services. And they depend on the structure of production, in particular asset distribution among producers (farm or firm size) and the labor intensity of production.

In this paper, we present new evidence on the capacity of agricultural growth to serve as an effective instrument for poverty reduction. We look at: the poverty reduction value of land and labor productivity growth and of GDP growth originating in agriculture versus the rest of the economy; the comparative linkage value of a quantum of sectoral growth for aggregate growth and poverty reduction; the contribution made by rural areas to aggregate poverty reduction under alternative migration scenarios; and the household pathways out of poverty in the context of aggregate growth, in particular via market-oriented smallholder farming. The key relation between public investment and sectoral growth response needs to be determined in order to decide when to use an
agriculture-first poverty reduction strategy. While this relation is central to deciding on use of agriculture for development, it remains difficult to establish and clearly conditional on the circumstances where it applies. We review evidence indicating that there are many situations where investing in agriculture for poverty reduction may be the preferred strategy.

Productivity Growth and Rural Poverty: Regularities

Productivity gains are the main mechanism whereby growth is achieved. In agriculture, most important are land and labor productivity. Regularities in the productivity–poverty relation for these two types of productivity gains are suggestive of what agriculture can do for poverty reduction.

Land Productivity and Poverty

In agriculture, yield increases are the main source of output growth once the agricultural frontier has been exhausted. This is the case in East Asia where new land for area expansion is hardly available. This is also increasingly the case in Africa, where population pressure on the land and the increasing speed of rotations between cultivation and fallow periods needs to be compensated by rising yields to maintain output. Rising yields thus support output gains which in turn can increase incomes in self-employment and employment opportunities for those on the labor market. In figure 1, observations on cereal yields measuring

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**Figure 1. Cereal Yields and Rural Poverty**

![Figure 1. Cereal Yields and Rural Poverty](image)

average land productivity and rural poverty indices are reported for 1993, 1996, 1999, and 2002, with a base of 100 in 1993 for each of five regions and three major countries. The expected inverse relationship between rising yields and falling rural poverty is visible. It does, however, vary widely across regions. In East Asia, a 10 percent growth in cereal yields is accompanied by a decline in rural poverty of more than 53 percent. In Eastern Europe and Central Asia, after a transition over which yields were stagnant and poverty rose, subsequent yield gains were associated with a rapid decline in rural poverty. In Latin America and the Caribbean, gains in cereal yields were very large, growing at an average annual rate of 2.5 percent, yet rural poverty hardly declined. Clearly, the way yield gains were achieved did not help reduce poverty. In Sub-Saharan Africa, yields were largely stagnant and the rural poverty rate remained unchanged. Similar patterns are observed at the country level, with elasticities of rural poverty reduction with respect to cereal yield growth equal to −5.1 in China, −1.2 in India, and −0.6 in Brazil. These are simple correlates, yet the contrast is telling of how land productivity gains can matter for rural poverty reduction, but differentially across the contexts in which they occur. The China–Brazil contrast is revealing of the importance of a more egalitarian land tenure system in transmitting land productivity gains into poverty reduction.

**Labor Productivity and Poverty**

Labor productivity in agriculture is also a major determinant of agricultural incomes. It can increase as a consequence of technological change in agriculture or of out-migration from agriculture. The labor productivity–poverty relation can, however, be quite different across countries according to the production structure: strong if smallholders participate in the gains in labor productivity and if agriculture is labor intensive; weak if otherwise. This is exemplified in figure 2 by the contrasts in the labor productivity–rural poverty relation over the period 1993–2002 across major regions and countries. Labor productivity is measured by the average value added in agriculture per worker in the sector. The two extreme cases are East Asia and Latin America and the Caribbean. In East Asia, labor productivity gains were large and the rural poverty rate fell sharply. Agriculture is practiced by smallholders and it is labor intensive. In Latin America and the Caribbean, labor productivity gains were very large as well, but rural poverty hardly fell. Agricultural growth in countries such as Brazil occurred mainly in mechanized large farms with little employment creation. Labor productivity was further enhanced by rapid rural–urban migration, leading to an absolute decline in agricultural labor, yet without decline in rural poverty. Other regions span the range between these two extremes. In Sub-Saharan Africa, with high population growth and limited employment opportunities, labor productivity gains in
agriculture were low, and poverty reduction was equally low. In South Asia, India most particularly, low rural–urban migration rates and low growth in agricultural production during the period that followed the Green Revolution also atrophied productivity gains.

Permanence of rural poverty and rising disparities between rural and urban incomes as growth accelerates in other sectors of the economy are a major political issue. In Eastern Europe and Central Asia, labor productivity fell during the transition out of collective farming into a market economy, but it was subsequently followed by rapid labor productivity gains and sharp rural poverty reduction. The elasticities of poverty reduction with respect to agricultural labor productivity growth are \(-1.2\) in China, \(-1.2\) in India, and \(-0.3\) in Brazil. Differences in these correlates show that labor productivity gains in agriculture can be quite effective for poverty reduction, but that the structural conditions under which agricultural growth occurs matter for the poverty reduction effect it can have. This in turns tells us that policy instruments can be used to enhance the poverty reduction value of agricultural growth.

The Power of Growth Originating in Agriculture for Poverty Reduction: Causalities

Reliable estimates of the growth–poverty relation are few as identification of causality in this relation is difficult to establish. Different studies used different indicators of outcome (income of the poor, poverty rates) and different concepts of
growth (agricultural labor productivity, sectoral value added). Results in general support the high poverty reduction capacity of agricultural growth. However, because concepts used are different, results are not directly comparable.

Bravo-Ortega and Lederman (2005) estimated the effect of an increase in sectoral labor productivity on GDP growth and the income of the poor. They found that overall GDP growth originating in an increase in agricultural labor productivity is on average 2.9 times more effective in raising the income of the poorest quintiles in developing countries than an equivalent increase in GDP growth originating in non-agricultural labor productivity. Christiaensen and Demery (2007) estimated the effect of sectoral growth on the headcount poverty rate rather than on the income of the poorest. They found for Africa that overall GDP growth coming from agriculture is 2.7 times more effective in reducing 1$/day poverty in the poorest quarter of countries in their sample, and 2 times more effective in the richest quarter of countries, than growth coming from non-agriculture. Ravallion and Chen (2007) estimated the effect of sectoral growth on the headcount poverty rate in China using annual poverty data over 21 years. They find that the primary sector has a 3.5 times larger impact on poverty reduction that either the secondary or tertiary sectors. Using cross-country data for 55 countries with spells of observations, Loayza and Raddatz (forthcoming) show that what matters for the poverty reduction capacity of growth is the unskilled labor intensity of a sector. In that perspective, agriculture comes ahead of industry and services. Growth originating in agriculture is 2.9 times more poverty reducing than growth originating in manufacturing and 1.8 times that of growth originating in construction.

For the World Development Report 2008 on Agriculture for Development, Ligon and Sadoulet (2007) estimated the expenditure growth effect for each household decile in the distribution of expenditures due to GDP growth originating in the agricultural sector and to GDP growth originating in the non-agricultural sectors, respectively. These estimations are obtained from the information available in the World Bank's PovCal database (World Bank 2008) for 42 countries that have at least three expenditure surveys over the period 1978 to 2003. Estimations are done with rigorous econometric methods that ensure that the results can be interpreted as a causal effect of sectoral growth on household expenditures, and are shown to be robust to a variety of specification checks.2

Results indicate that GDP growth originating in agriculture has a much larger positive effect on expenditure gains for the poorest households than growth originating in the rest of the economy. Figure 3 shows the relative strength of these effects measured as the ratio of the estimated coefficients of agricultural and non-agricultural growth on household expenditures. Overall growth originating in agriculture is estimated to be at least three times as effective in reducing poverty
as overall growth originating in the rest of the economy. This statement is based on the relative impacts of growth from agriculture and non-agriculture on the expenditures of the poorest four deciles which have a median value of 3.1. The relative impact is significantly different from 1 for the poorest 50 percent of the population.

Further sectoral disaggregation of non-agriculture shows that other sectors can also have high poverty reduction value, and that this varies across regions. Thus, Hasan and Quibria (2004) found that, while growth in agriculture is most effective for poverty reduction in Sub-Saharan Africa and South Asia, growth in industry is most effective for East Asia and in services for Latin America. Ravallion and Datt (1996) and Foster and Rosenzweig (2005) for India, and Suryahadi, Suryadarma, and Sumarto (2008) for Indonesia, all find that agricultural growth is key to reducing poverty in rural areas. But they also find that informal services, rural factory employment, and both urban and rural services, respectively, have important impacts on rural poverty reduction, complementing the role of agriculture.

Loayza and Raddatz (forthcoming) singled out growth in construction as the most poverty reducing sector in non-agriculture, expectedly because it is the next most intensive sector in unskilled labor after agriculture. So, while growth originating in agriculture has strong powers for poverty reduction, there are other sectors that can be quite effective as well, especially if they are intensive in

Source: Ligon and Sadoulet (2007).
unskilled labor and are located in the rural non-farm economy. This suggests that a growth strategy for poverty reduction must focus not only on agriculture growth but on the growth of these other strategic sectors as well.

Opening the Growth–Poverty Black Box: The Role of Linkages

Agricultural growth contributes to both aggregate growth and overall poverty reduction through two effects: directly as a sector of economic activity, and indirectly through growth linkages with non-agriculture. What are the relative contributions to growth and poverty reduction of each of these two effects? In this section, we compare the aggregate growth and poverty effects of a one percent growth in both agriculture and non-agriculture. The absolute levels of these effects are obviously affected by the sizes of these sectors. However, the focus of this section is on the relative importance of the direct and linkage effects, which is not.

The role of linkages is illustrated in figure 4 with results for China over the 1980–2001 period. This was a time of rapid growth, not only for the non-agricultural sector (growing at an average 9.3 percent annual rate) but also for the agricultural sector (growing at an average 4.6 percent annual rate), where

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**Figure 4.** Estimates of the Agricultural Growth–Non-agricultural growth poverty linkages for China, 1980–2001

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The World Bank Research Observer, vol. 25, no. 1 (February 2010)
Table 1. Direct and Indirect Contributions of Sectoral Growth to Aggregate Growth and Poverty Reduction in China, 1980–2001

<table>
<thead>
<tr>
<th>Sectoral growth</th>
<th>Aggregate growth</th>
<th>Contributions to growth (%)</th>
<th>Contributions to poverty (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct</td>
<td>Indirect</td>
</tr>
<tr>
<td>Agriculture 1%</td>
<td>0.45</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>Non-agriculture 1%</td>
<td>0.92</td>
<td>85</td>
<td>15</td>
</tr>
</tbody>
</table>

growth was driven by improved incentives (the household responsibility system replacing collective farms, and domestic market liberalization replacing regional food self-sufficiency). During these years, the sectoral shares of GDP were on average 22 percent for agriculture and 78 percent for non-agriculture. A one percent growth of the smaller agricultural sector induces a 0.29 percent growth in the much larger non-agricultural sector. This growth in the non-agricultural sector amounts to 0.23 percentage points of aggregate economic growth. Conversely, a 1 percent growth of the non-agricultural sector induced a 0.64 percent agricultural growth. This added 0.14 percent points to aggregate economic growth, a smaller indirect contribution due to the lower share of the agricultural sector in GDP. Given the relative sizes of the two sectors, these multipliers can also be read as $1 growth in agriculture inducing $1 growth in non-agriculture, while $1 growth in non-agriculture induced $0.18 in agriculture, showing the very strong growth linkages arising from agriculture at that particular time in China. Combining the direct and linkage effects shows that a 1 percent growth in agriculture has an aggregate growth effect of 0.45 percent, lower than the 0.92 percent aggregate growth induced by a 1 percent increase in non-agriculture.

In terms of poverty reduction, the growth elasticities were estimated by Ravallion and Chen (2007) to be −7.85 for agriculture and −2.25 for non-agriculture. As a result, a 1 percent growth in agriculture would induce a direct reduction in the poverty rate of 1.73 percent, about the same as the 1.76 percent direct contribution induced by a 1 percent increase in non-agriculture. This is despite the fact that the share of agriculture in GDP is only 22 percent. Combining the direct and indirect effects gives an overall poverty reduction of 2.24 percent following a 1 percent growth in agriculture, and 2.85 percent following a 1 percent growth in non-agriculture.

The structure of direct and indirect contributions to aggregate growth and poverty reduction coming from a 1 percent sectoral growth is presented in table 1. The remarkable feature is the large indirect contribution of agriculture to growth (51 percent of the total effect), while for non-agriculture the largest contribution is direct (85 percent). The effect is the opposite for poverty: agriculture
has a large direct contribution to overall poverty reduction (77 percent), while it is non-agriculture that has the relatively larger indirect effect (38 percent). Linkage effects of agriculture on the rest of the economy are thus important for growth; direct effects are important for poverty reduction.

Finally, if we return to a comparison of the poverty reduction value of a 1 percent GDP growth coming from agriculture versus non-agriculture, we see that the first contributes a 10.2 percent reduction in poverty while the latter contributes 3.7 percent. We thus rediscover for China during the 1980–2001 period the result obtained by Ligon and Sadoulet (2007) using cross-country data: GDP growth originating in agriculture is about three times (2.8 times for China) more effective for poverty reduction than growth originating in non-agriculture.

These particular results are specific to China in the 1980–2001 period. They show that agriculture poverty reduction effects are relatively more direct than its growth effects. The importance of the linkage effects on non-agriculture as opposed to the direct effect is largely related to the mere size of the agricultural sector that implies that most of its linkages are externalized to the other sectors. The fact that this is not so for the poverty effect reveals the fundamental poverty reduction value of agricultural growth. However, simply because of its relatively small share in aggregate GDP, a percentage point growth in agriculture can have less aggregate growth and even less poverty reduction effect than a percentage point growth in the large non-agricultural sector.

An Agriculture-first Strategy for Poverty Reduction: Piecing together the Evidence

Is it justified to invest public resources in agriculture as the most cost effective option in using growth to reduce poverty? In asking this question, we are not trying to compare the cost effectiveness of transfers versus investments in growth to reduce poverty, only of the latter across sectors of economic activity. If agriculture were the most cost effective investment, this would be the argument in support of an “agriculture-first” strategy for poverty reduction (Suryahadi, Suryadarma, and Sumarto 2008). Not surprisingly, the answer is that it depends on country context, though there are many cases where focusing on agriculture as the preferred strategy is plausible.

The empirical evidence presented above allows us to make two strong statements on the role of agricultural growth for poverty reduction. The first is that GDP growth that originates in agriculture (that is for an equal 1 percent of GDP growth) tends to be more effective for poverty reduction than growth that originates in other sectors of the economy, with unskilled labor intensive activities.
located in the rural non-farm economy as strong complementary instruments. The second is that the growth of agriculture makes relatively large indirect contributions to aggregate growth, while its contributions to poverty reduction are larger via direct than indirect effects. Agriculture growth is thus a good servant of aggregate growth and a direct actor for aggregate poverty reduction.

But comparison of the poverty reduction value, neither of a given aggregate growth originating in either sector, nor of a 1 percent growth in sectors of different sizes, can answer the policy question of whether to invest in agricultural growth to maximize poverty reduction. The key question is how much growth do we get from public investment in agriculture versus investment in other sectors of the economy? This is where the information is still incomplete, due to both conceptual and econometric reasons. Conceptually, it is difficult to define sectoral investment. Most investments, such as infrastructure, health, and education, have strong intersectoral spillovers. Econometrically, it is difficult to consider investment exogenous to growth outcomes, as investments are targeted where growth potential is the highest. More effective is to go to detailed case studies. Investment in research and development (R&D) for agriculture tends to have large geographical spillovers, creating high rates of returns for such investments. While there is undoubtedly selection of successful cases in measuring rates of return from specific agricultural R&D investments, a large number of success stories shows that high returns are at least broadly possible, with an average 43 percent rate of return across 700 studies, well above the opportunity cost of public investment (Alston and others 2000). Brazil has made significant investments in a premier public agricultural research institution, EMBRAPA, and reaped spectacular land productivity gains in huge areas of the country, fueling its agro-export boom. Investment in rural roads can similarly have high rates of return, but the level of this return and the incidence of gains and losses across households depend importantly on complementary investments and on households’ distance from market and asset endowments (van de Walle and Mu 2007). As should be expected, rates of return to public investment in agriculture thus vary depending on context, and the incidence of gains and losses can be quite unequally distributed.

The causal chain running from public investment to agricultural growth, overall growth, and poverty reduction thus critically depends on the investment–growth linkage which remains weakly established and conditional on circumstances that are varied and complex. There are, however, sufficient case studies of competitive returns to make the case for investing in fostering agriculture growth as an effective strategy for poverty reduction under the right conditions. This is more likely to be the case where agriculture is a high share of GDP, competitive advantage is located in agriculture, and the majority of the poor are in the rural sector. These are the defining characteristics of the "agriculture-based countries,"
mainly poor countries located in Sub-Saharan Africa and also in Central America and the Caribbean (World Bank 2007). “Agriculture-based” conditions are also found in many regions internal to large countries, making the growth–poverty role of agriculture important outside of the poor countries as well.

The Contribution of Rural Areas to the Decline in Overall Poverty

While most countries and regions of the world have experienced a decline in the rural poverty rate over the period 1993–2002, often larger in percentage points than the decline in urban poverty, this does not necessarily mean that most progress in poverty reduction came from the rural areas. Indeed, higher urban incomes have induced important rural–urban migration flows, raising the possibility that reductions in rural poverty were due to migration of the poor as opposed to a genuine decline in poverty among the non-migrants that stay in rural areas. Of interest is thus to estimate what has been the contribution of rising incomes in rural areas to overall poverty reduction, net of the role of migration. This is done using a standard decomposition of aggregate poverty reduction into sectoral changes (urban and rural) and a population shift component based on the transition of migrants from rural to urban areas. In this decomposition, the “rural contribution” is the decline in aggregate poverty that is due to the decline in poverty of the population of non-migrants that remain rural.

Performing this decomposition thus requires specifying who migrates out of rural areas among the poor and the non-poor. Not having this information on the composition of migrants, we simulate three cases that establish a range of possible values for the rural contribution. The first case consists in assuming that migration is poverty neutral, that is that the poor and non-poor migrate at the same rate out of rural areas. In this case, the decline in the poverty rate of non-migrants is equal to the observed decline in the rural poverty rate. The second case considers the extreme condition where all migrants are poor. If the poor are more likely to migrate, migration in itself contributes to the reduction of poverty in rural areas by its selection process. The “rural contribution” is due to the reduction of poverty in rural areas beyond the poverty reduction effect of migration of the poor. This case thus gives a lower bound to the genuine reduction of aggregate poverty achieved in rural areas. The third case considers the other extreme condition where it is the non-poor who are more likely to migrate, as documented for many countries. In this case, selection into migration contributes to an increase in the poverty rate in rural areas. The reduction in rural poverty among the non-migrants is even higher than the observed decline.
in poverty. The extreme case where all migrants are non-poor gives an upper bound for the rural contribution.

Table 2 reports the rural contribution to poverty change under the three scenarios, which give a range for the rural contribution to poverty reduction. For the world, the aggregate poverty rate over the 1993–2002 period declined by 8.8 percentage points. Of these at least 45 percent and up to 93 percent can be attributed to the decline in poverty among the rural population, with the intermediate value of 56 percent under poverty neutral migration. These aggregate numbers are however dominated by China’s extraordinary success. For the rest of the world, the decline in poverty was a modest 1.8 percentage points, of which 79 percent (using neutral migration) was due to rural areas.

Heterogeneity is seen across regions. In China, 72 percent of the population and 86.5 percent of the poor resided in rural areas in 1993. Over these ten years, China experienced a huge decline of 30 percentage points in poverty rates, with poverty declining both in the urban (25 percentage points) and rural (24 percentage points) areas. So, without migration, both sectors would have contributed to the decline in the poverty rate proportionally to their share in poverty. But a large migration (8 percent of the rural population) moved people from the high rural poverty rate (88.6 percent in 1993) to the much lower urban poverty rate (35.6 percent in 1993). This resulted in a rural contribution to the decline in poverty equal to about half of the aggregate. Since the poverty rate was so high, there is not much difference between the “neutral” migration (which assumes that 88.6 percent of migrants are poor) and the migration of poor (which assumes that 100 percent of migrants are poor) scenarios. Aggregate results for East Asia are dominated by the Chinese experience.

The situation in India is quite different. Urban and rural poverty rates are not very different (91.5 percent vs 82.3 percent in 1993), and neither one changed much over the ten-year period. In addition there was almost no migration. So aggregate poverty only declined by 3.5 percent. With a somewhat lower decline in poverty in rural areas and a small migration, the rural contribution ranges from 56 to 111 percent, and is equal to 61 percent under the assumption of neutral migration. Hence, the contributions of the rural sector is in percentage terms similar to what happened in China, but with low reductions in both sectors and low migration effects, rather than high reductions in both sectors and high migration effects. South Asia as a whole is not very different from India, with slightly lower poverty rates, and even less poverty reduction in rural areas. So aggregate poverty has declined by a very small 1.7 percentage point, and only 33 percent came from rural progress, if migration is assumed to have been neutral.

Latin America and the Caribbean is also different. It started with a large difference between rural and urban poverty rates (47 percent vs 23 percent) but with a small share of the population residing in rural areas (28 percent). Of the poor,
Table 2. Contributions of the Rural Sector to Aggregate Poverty Change, 1993–2002

<table>
<thead>
<tr>
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<td><strong>33.7</strong></td>
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</tbody>
</table>

*Sources: Poverty data from Ravallion, Chen, and Sangraula (2007) using a PPP$2.15/day poverty line; contribution of rural sector from authors’ calculations.*
44.3 percent resided in rural areas in 1993. Over the ten-year period, there was some migration, almost no decline in the rural poverty rate, and an increase in urban poverty. Aggregate poverty increased from 29.6 to 31.6 percent. Depending on the migrant composition, the contribution of the rural sector to changes in aggregate poverty is estimated to be an increase in poverty when only the poor migrate, giving maximal contribution to migration, or a decrease in poverty when only the non-poor migrate. With poverty-neutral migration, the rural contribution to poverty was a negative 10 percent, indicating again the Latin American exception in helping the rural poor benefit from agricultural growth.

In Sub-Saharan Africa, we observe a small decline in rural poverty but an increase in the urban poverty rate, adding up to an overall decline in poverty because the population is still predominantly rural. Because poverty rates are much higher in rural (85.2 percent in 1993) than in urban areas (66.9 percent), even under the neutral migration scenario, the urban increase in poverty rate was largely due to the in-migration of rural poor. With failing agriculture and failing aggregate growth, rural—urban migration contributed to an increase in the urban poverty rate. Rural poverty decline contributed 81 percent of aggregate poverty reduction under the neutral migration scenario.

We can thus conclude that the rural sector’s contribution to aggregate poverty reduction was large overall. It accounted for more than half of aggregate poverty reduction worldwide and up to three-quarters for the rest of the world when China is excluded. Note that this is an accounting decomposition, measuring the share of the decline in poverty among the rural population in the aggregate decline in poverty, not a causal relationship between rural growth and poverty reduction. Most of this effect expectedly came from incomes generated in the rural sector, mainly from agricultural growth. Other factors that have contributed to rural income growth include public transfers and remittances received by rural households which are derived from urban and foreign income growth. Migration also contributes to rural income growth through rising wages by reducing the rural labor supply.

**Household-level Analysis: Agricultural Growth Offering Pathways out of Poverty**

How do different categories of farming households benefit from agricultural growth? Agriculture offers rural households a number of pathways out of poverty: they can increase their incomes by selling agricultural products on markets (market-oriented farming households), they can leave the subsistence economy and become market participants (market entrants), and they can
Table 3. Pathways out of Poverty in Vietnam, 1992/3–1997/8

<table>
<thead>
<tr>
<th>Categories of farming households</th>
<th>Market-oriented</th>
<th>Market entrants</th>
<th>Subsistence-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of farming households (%)</td>
<td>28</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Poverty outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of households below the poverty line (%)</td>
<td>64</td>
<td>-42</td>
<td>73</td>
</tr>
<tr>
<td>Income structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of agricultural income in total income (%)</td>
<td>83</td>
<td>-12</td>
<td>83</td>
</tr>
<tr>
<td>Share of high value and industrial crops in gross agricultural income (%)</td>
<td>29</td>
<td>34</td>
<td>21</td>
</tr>
</tbody>
</table>

Source: Data from Vietnam Living Standard Surveys (World Bank 2009).

improve their well-being in the subsistence economy either through farming or through other sources of income (subsistence-oriented households). Vietnam offers a good case study, both because agricultural growth was rapid (an average annual growth in real agricultural value added of 4.1 percent in the period 1992–98) and because we have rare household panel data over that period that allow us to track what happened to different categories of households. In table 3, we look at rural farming households defined as those with more than 50 percent of their income, including home consumption, derived from agriculture, and recognize three pathways: market-oriented farming households selling more than 25 percent of their agricultural production in both the initial (1992/3) and terminal (1997/8) years; market entrants who were selling less than 10 percent in the base period and more than 25 percent in the terminal year; and subsistence-oriented farming households who were selling less than 10 percent in both initial and terminal years. These three groups constitute 47 percent of the farming households, the remaining having more mixed income strategies.

Market-oriented households benefited most from this period of rapid agricultural growth, with a 42 percent reduction in their poverty rate. While they diversified away from agriculture as a source of income, they also diversified away from staple crops (rice) toward high value and industrial crops. Among market entrants, poverty fell by 35 percent and they also importantly diversified both away from agriculture and toward high value and industrial crops in agriculture. Finally, for the subsistence farmers in the base period that remained in that
category through the period, poverty was reduced by 28 percent. They continued to produce staple crops for home consumption. Their income gains were mainly derived from diversifying away from agriculture, benefiting from employment creation in agriculture and in the rural non-farm economy driven by overall agricultural growth.

Agricultural growth can thus pull farming households out of poverty along a multiplicity of pathways. The implication is that making these pathways more effective for poverty reduction will require specific policies for specific categories of households: supporting competitiveness for market-oriented farming households; enhancing access to assets and to markets to favor market entry for subsistence households; and improving production for home consumption and entry into rural labor markets for subsistence-oriented farming households. Designing specific policies for specific categories of households is thus a very important principle in making policy in support of agriculture for development. It requires access to information about the opportunities and constraints that apply to each of these categories of households that can only be obtained through their active participation in policy design.

Policy Implications: Agriculture for Development

With two competing approaches to poverty reduction—transfers and pro-poor growth—a key policy issue is to find the right balance in allocating public resources and foreign aid budgets between the two approaches for optimum complementarity. The dilemma is particularly stark when poverty and hunger are high and time to achieve relief is short, tilting public expenditure priorities toward transfers as opposed to promoting the growth of autonomous incomes. In recent years, increased emphasis has been given to poverty reduction via transfers, sometimes conditional on behavior toward child education and health. This has contributed to the neglect of agricultural growth as an instrument for poverty reduction. This shift in emphasis has been the product of a complex set of circumstances including the urgency of addressing the poverty effects of the debt crisis and stabilization policies, low profitability of investments in agriculture due to declining commodity prices on international markets, low effectiveness of poverty reduction projects based on agriculture (using approaches such as state-led integrated rural development projects, parastatal agencies for marketing, subsidized credit, and the training-and-visit approach to extension), and perceived inevitable conflicts between agriculture and the environment.

Yet, we know that autonomous income growth is, in the long run, the better instrument for poverty reduction among those who have the potential to work. And we have seen that agricultural growth—along with the growth of unskilled
labor intensive activities in the rural non-farm economy—can be particularly effective for poverty reduction via autonomous income growth. Growth originating in agriculture can be three times more effective in reducing poverty than growth originating in the rest of the economy. Yet, not all agricultural growth is equally effective. Growth in cereal yields and in agricultural labor productivity have been associated with greater poverty reduction in East Asia than in Latin America. Agricultural growth can have not only strong direct poverty reduction effects on but also strong growth linkages to the rest of the economy. The contribution of the rural sector to aggregate poverty reduction, largely driven by agricultural growth, has been about half of total poverty reduction, even under conservative assumptions regarding the contribution of migration, and it has been particularly high in Sub-Saharan Africa, precisely where it matters the most. Heterogeneity of rural populations suggests that there exist multiple pathways for using agriculture to help rural households move out of poverty, with market-oriented smallholder farming the most effective one. Existence of multiple pathways amplifies the array of policy instruments that can be used, calling on the design of specific interventions for specific categories of rural households. This suggests that a return to using growth in agriculture as an instrument for poverty reduction may be warranted under many circumstances. While much is still left to be researched, in particular to determine how to achieve growth in agriculture more cost effectively and how to make it more pro-poor, we now have a better understanding of how agriculture contributes to poverty reduction, and what features of the structural context can enhance this effect. Conditions to invest profitably in agriculture are currently more favorable than they have been for the last 35 years: markets are significantly less distorted, commodity prices are higher, markets for high value crops and animal products are expanding, and there are numerous technological and institutional innovations available to enhance supply response. New options to design investments in agriculture so they are more pro-poor are also emerging. This includes projects that are more decentralized; more participatory; give greater attention to not only access to assets for the rural poor but also to the role of the market, public goods, and institutional conditions for effective use of these assets; and seek to make growth more compatible with environmental protection and more resilient to climate shocks. Commitments by governments and international development agencies to place more resources in support of agriculture-based development projects have been made, in particular in response to the stress of the food crisis. Current conditions are thus generally favorable to use again agricultural growth—along with other linked sectors—as an effective instrument for poverty reduction. Realizing this potential requires careful design of investment in agriculture to achieve growth, political commitments by governments and donors, and a voice for the private sector and civil society to ensure that these commitments are implemented.
Notes

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1. Though this does not necessarily benefit the poor proportionately more than the non-poor, as in the UNDP's definition of pro-poor growth; see Ravallion (2004).

2. Details are given in Ligon and Sadoulet (2007). The expenditure equation they estimate for deciles, countries, and years uses year and country-decile fixed effects, as well as instrumentation of sectoral income growth using the average of neighboring countries' growth rates of agriculture value added as an instrument for own-country agriculture value added growth. Estimates are shown to be robust to a range of alternative specifications designed to challenge the result obtained.

3. Data from World Bank (2006). These estimates of intersectoral linkages are obtained from a vector autoregressive model with the optimal lag order. Details on the estimation are given in the Appendix to de Janvry and Sadoulet (2008).

4. This finding justifies investing in agricultural R&D even if rates of return to investment in non-agricultural R&D are high or even higher for as long as a capital market exists.

5. Details on the equations used to calculate the rural contribution are given in the Appendix to de Janvry and Sadoulet (2008).

References

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Policy Reforms Affecting Agricultural Incentives: Much Achieved, Much Still Needed

Kym Anderson

For decades, earnings from farming in many developing countries have been depressed by a pro-urban bias in own-country policies, as well as by governments of richer countries favoring their farmers with import barriers and subsidies. Both sets of policies reduce national and global economic welfare and inhibit agricultural trade and economic growth. They almost certainly add to inequality and poverty in developing countries, since three-quarters of the world's billion poorest people depend on farming for their livelihood. During the past two decades, however, numerous developing country governments have reduced their sectoral and trade policy distortions, while some high-income countries also have begun reducing market-distorting aspects of their farm policies. The author surveys the changing extent of policy distortions to prices faced by developing-country farmers over the past half century, and provides a summary of new empirical estimates from a global economy-wide model that yield estimates of how much could be gained by removing the interventions remaining as of 2004. The author concludes by pointing to the scope and prospects for further pro-poor policy reform in both developing and high-income countries. JEL codes: F13, F14, Q17, Q18

For many decades agricultural protection and subsidies in high-income (and some middle-income) countries have been depressing international prices of farm products, which lowers the earnings of farmers and associated rural businesses in developing countries (Johnson 1991; Tyers and Anderson 1992). Those policies almost certainly add to inequality and poverty, since three-quarters of the world's poorest people depend directly or indirectly on agriculture for their main income (World Bank 2007). Currently less than 15 million relatively wealthy farmers in developed countries, with an average of almost 80 hectares per worker, are being...
helped at the expense of not only consumers, taxpayers, and producers of other tradables in those rich countries but also the majority of the 1.3 billion relatively impoverished farmers and their large families in developing countries who, on average, have to earn a living from just 2.5 hectares per worker.

But in addition to this external policy influence on rural poverty, the governments of many developing countries have directly taxed their farmers over the past half-century. A well-known and often-cited example is the taxing of exports of plantation crops in post-colonial Africa (Bates 1981). Furthermore, many developing countries in the 1960s and 1970s chose also to pursue an import-substituting industrialization strategy, predominantly by restricting imports of manufactures. As Krueger, Schiff, and Valdés (1988, 1991) showed in their seminal multi-country study, this indirectly taxed other tradable sectors in those developing economies, including agriculture.

Thus the price incentives facing farmers in many developing countries have been depressed by both own-country and other countries’ farm, food, and trade policies. I will survey the extent to which government policies at home and abroad have distorted prices faced by developing-country farmers over the past half-century. I begin with a brief examination of the methodology required to measure the extent of own-country distortions to farmer incentives. I then survey analyses of the effects of those agricultural and trade policies on incentives over time, focusing on the worsening of that situation between the 1950s and early 1980s and on the progress that has been made over the 25 years since then.

Notwithstanding recent reforms, many price distortions remain in the agricultural sector of both developing and high-income countries. I provide a summary of new empirical estimates from a global economy-wide model that indicate how much could be gained by removing the interventions remaining as of 2004. I conclude by pointing to the scope and prospects for further pro-poor policy reform in both developing and high-income countries.

National Distortions to Incentives: Basic Theory

Bhagwati (1971) and Corden (1997) define the concept of a market policy distortion as something that governments impose to create a gap between the marginal social return to a seller and the marginal social cost to a buyer in a transaction. Such a distortion creates an economic cost to society which can be estimated using welfare-measuring techniques such as those pioneered by Harberger (1971). As Harberger notes, this focus allows a great simplification in evaluating the marginal costs of a set of distortions: changes in economic costs can be evaluated by taking into account the changes in volumes directly affected by such distortions, ignoring all other changes in prices. In the absence of divergences such
as externalities, the measure of a distortion is the gap between the price paid and the price received, irrespective of whether the level of these prices is affected by the distortion.\textsuperscript{2}

Importantly, the total effect of distortions on the agricultural sector will depend not just on the size of the direct \textit{agricultural} policy measures, but also on the magnitude of distortions generated by direct policy measures altering incentives in \textit{non-agricultural} sectors. It is \textit{relative} prices, and hence relative rates of government assistance, that affect producers' incentives. In a two-sector model an import tax has the same effect on the export sector as an export tax: the Lerner (1936) Symmetry Theorem. This carries over to a model that has many sectors, and is unaffected if there is imperfect competition domestically or internationally or if some of those sectors produce only non-tradables (Vousden 1990, pp. 46–7). The Symmetry Theorem is therefore also relevant for considering distortions within the agricultural sector. In particular, if import-competing farm industries are protected, for example via import tariffs, this has similar effects on incentives to produce exportables as does an explicit tax on agricultural exports; and if both measures are in place, this is a double imposition on farm exporters.

\textit{Direct Agricultural Distortions}

Consider a small, open, perfectly competitive national economy with many firms producing a homogeneous farm product with just primary factors. In the absence of externalities, processing, producer-to-consumer wholesale plus retail marketing margins, exchange rate distortions, and domestic and international trading costs, that country would maximize national economic welfare by allowing the domestic producer and consumer prices of that product to both equal $E$ times $P$, where $E$ is the domestic currency price of foreign exchange and $P$ is the foreign currency price of this identical product in the international market. That is, any government-imposed diversion from those two equalities, in the absence of any market failures or externalities, would be welfare-reducing for that small economy.

\textit{Price-distorting Trade Measures at the National Border.} The most common distortion is an \textit{ad valorem} tax on competing imports (usually called a tariff), $t_m$. Such a tariff on imports is the equivalent of a production subsidy and a consumption tax, both at rate $t_m$. If that tariff on the imported primary agricultural product is the only distortion, its effect on producer incentives can be measured as the \textit{nominal rate of assistance} (NRA) to farm output conferred by border price support (NRA$_{BS}$), which is the unit value of production at the distorted price, less its value at the

\textit{Anderson}
undistorted free market price, expressed as a fraction of the undistorted price:  

\[
NRA_{BS} = \frac{E \times P(1 + t_m) - E \times P}{E \times P} = t_m
\]  

(1)

The effect of that import tariff on consumer incentives in this simple economy is to generate a consumer tax equivalent (CTE) on the agricultural product for final consumers:

\[
CTE = t_m
\]

(2)

The effects of an import subsidy are identical to those in equations (1) and (2) for an import tax, but \( t_m \) in that case would have a negative value.

Governments sometimes also intervene with an export subsidy \( s_x \) (or an export tax, in which case \( s_x \) would be negative). If that were the only intervention, then:

\[
NRA_{BS} = CTE = s_x
\]

(3)

**Domestic Producer and Consumer Price-distorting Measures.** Some governments provide a direct production subsidy for farmers, \( s_f \) (or production tax, in which case \( s_f \) is negative, including via informal taxes in kind by local and provincial governments). In that case, if only this distortion is present, the effect on producer incentives can be measured as the nominal rate of assistance to farm output conferred by domestic price support (\( NRA_{DS} \)), which is as above except \( s_f \) replaces \( t_m \) or \( s_x \), but the CTE in that case is zero. Similarly, if the government just imposes a consumption tax \( c_c \) on this product (or consumption subsidy, in which case \( c_c \) is negative), the CTE is as above except \( c_c \) replaces \( t_m \) or \( s_x \), but the \( NRA_{DS} \) in that case is zero.

The combination of domestic measures and border price support provides the following total rate of assistance to output, \( NRA_o \), and total consumer tax equivalent, CTE:

\[
NRA_o = NRA_{BS} + NRA_{DS}
\]

(4)

\[
CTE = NRA_{BS} + c_c
\]

(5)

**What if the Exchange Rate System Is also Distorting Prices?** Should a multi-tier foreign exchange rate regime be in place, then another policy-induced price wedge exists. A simple two-tier exchange rate system creates a gap between the price received by all exporters and the price paid by all importers for foreign currency, changing both the exchange rate received by exporters and that paid by importers from the equilibrium rate \( E \) that would prevail without this distortion in the domestic market for foreign currency (Bhagwati 1978). This requires
controls by the government on current account transfers. In the past it was common for exporters to be required to surrender their foreign currency earnings to the central bank for exchange to local currency at a low official rate, which is equivalent to a tax on exports to the extent that the official rate is below what the exchange rate would be in a market without government intervention. That implicit tax on exporters reduces their incentive to export and hence the supply of foreign currency flowing into the country. With less foreign currency, demanders are willing to bid up its purchase price, providing a potential rent for the government which can be realized by auctioning off the limited supply of foreign currency extracted from exporters, or by creating a legal secondary market. Either mechanism will create a gap between the official and parallel rates (Dervis, de Melo and Robinson 1981).

If the government chooses to allocate the limited foreign currency to different groups of importers at different rates, that is called a multiple exchange rate system. Some lucky importers may even be able to purchase it at the low official rate. The more that is allocated and sold to demanders whose marginal valuation is below the equilibrium rate, the greater the unsatisfied excess demand and hence the stronger the incentive for an illegal or “black” market to form, and for less-unscrupulous exporters to lobby the government to legalize the secondary market for foreign exchange and to allow exporters to retain some fraction of their exchange rate earnings for sale in the secondary market. Such a right given to exporters to retain and sell a portion of foreign exchange receipts would increase their incentives to export, and thereby reduce the shortage of foreign exchange and hence the secondary market exchange rate (Tarr 1990; Martin 1993).

For present purposes, what matters is that, where a country has distortions in its domestic market for foreign currency, the exchange rate relevant for calculating the \( \text{NRA}_o \) or the \( \text{CTE} \) for a particular tradable product depends, in the case of a dual exchange rate system, on whether the product is an importable or an exportable one, while in the case of multiple exchange rates it depends on the specific rate applying to that product each year. The precise way in which that can be handled is detailed in Anderson and others (2008).

**What if Farm Production Involves not just Primary Factors but also Intermediate Inputs?** Where intermediate inputs are used in farm production, any taxes or subsidies on their production, consumption, or trade would alter farm value added and thereby also affect farmer incentives. Sometimes a government will have directly offsetting measures in place, such as a domestic subsidy for fertilizer use by farmers but also a tariff on fertilizer imports. In other situations there will be farm input subsidies but an export tax on the final product. In principle all these items could be brought together to calculate an effective rate of direct assistance
to farm value added. The nominal rate of direct assistance to farm output, \( \text{NRA}_o \), is a component of that, as is the sum of the nominal rates of direct assistance to all farm inputs, call it \( \text{NRA}_i \). Where there are significant distortions to input costs, their \textit{ad valorem} equivalent can be accounted for by summing each input’s \( \text{NRA} \) times its input–output coefficient to obtain the combined \( \text{NRA}_i \), and adding that to the farm industry’s nominal rate of direct assistance to farm output, \( \text{NRA}_o \), to get the total nominal rate of assistance to farm production, \( \text{NRA} \).

**What about Post-farmgate Costs?** If a state trading corporation is charging excessively for its marketing services and thereby lowering the farm-gate price of a product, for example as a way of raising government revenue in place of an explicit tax, the extent of that excess is treated as if it were an explicit tax.

Some farm products, including some that are not internationally traded, are inputs into a processing industry that may also be subject to government interventions. In that case the effect of those interventions on the price received by farmers for the primary product also needs to be taken into account.

**The Mean and Variance of Agricultural NRAs.** When it comes to averaging across countries, each polity is an observation of interest, so a simple average is meaningful for the purpose of political economy analysis. But if one wants a sense of how distorted agriculture is in a group of countries, a weighted average is needed. The weighted average \( \text{NRA} \) for covered primary agriculture can be generated by multiplying each primary industry’s share of production (valued at the farm-gate equivalent undistorted prices) by its corresponding \( \text{NRA} \) and adding across industries. The overall sectoral rate, \( \text{NRA}_{ag} \), also could include actual or assumed information for the non-covered commodities and, where it exists, the aggregate value of non-product-specific assistance to agriculture. A weighted average can be generated also for just the tradables part of agriculture—including those industries producing products such as milk and sugar that require only light processing before they can be traded—by assuming that its share of non-product-specific assistance equals its weight in the total. Call that \( \text{NRA}_{ag}^t \).

In addition to the mean, it is important to provide also a measure of the dispersion or variability of the \( \text{NRA} \) estimates across the covered products. The cost of government policy distortions to incentives in terms of resource misallocation tends to increase as the degree of substitution in production increases (Lloyd 1974). In the case of agriculture which involves the use of farm land that is sector-specific but transferable among farm activities, the greater the variation of \( \text{NRA} \)s across industries within the sector, the higher will be the welfare cost of those market interventions. A simple indicator of dispersion is the standard deviation around the weighted mean of industry \( \text{NRA} \)s within the agricultural sector.
Trade Bias in Agricultural Assistance. A trade bias index is also needed to indicate the changing extent to which a country's policy regime has an anti-trade bias within the agricultural sector. This is important because, as mentioned above, the Lerner (1936) Symmetry Theorem demonstrates that a tariff assisting import-competing farm industries has the same effect on farmers' incentives as if there were a tax on agricultural exports; and, if both measures are in place, this is a double imposition on farm exporters. The higher is the nominal rate of assistance to import-competing agricultural production \( (NRA_{ag_{m}}) \) relative to that for exportable farm activities \( (NRA_{ag_{x}}) \), the more incentive producers in that subsector will have to bid for mobile resources that would otherwise have been employed in export agriculture, other things being equal.

Indirect Agricultural Assistance or Taxation via Non-agricultural Distortions

In addition to direct assistance to, or taxation of, farmers, the Lerner (1936) Symmetry Theorem further demonstrates that their incentives are also affected indirectly by government assistance to non-agricultural production in the national economy. The higher is the nominal rate of assistance to non-agricultural tradables production \( (NRA_{nonag}) \), the more incentive producers in other tradable sectors will have to bid up the value of mobile resources that would otherwise have been employed in agriculture, other things being equal. If \( NRA_{ag} \) is below \( NRA_{nonag} \), one might expect there to be fewer resources in agriculture than there would be under free market conditions in the country, notwithstanding any positive direct assistance to farmers, and conversely.

One way to capture this is to calculate a Relative Rate of Assistance, \( RRA \), defined as:

\[
RRA = \left[ \frac{1 + NRA_{ag}}{1 + NRA_{nonag}} - 1 \right]
\]

Since an \( NRA \) cannot be less than \(-1\) if producers are to earn anything, neither can an \( RRA \). This measure is a useful indicator for providing international comparisons over time of the extent to which a country's policy regime has an anti- or pro-agricultural bias.

National Distortions to Farmer Incentives: The Evolution of Policies

Before turning to the contemporary (post-World War II) situation, it would be insightful to examine briefly the long history of government intervention in
international markets for farm products by today's advanced economies, since similar political economy forces may influence policy choices in later-developing countries. Attention then turns to the price-distorting policies of developing countries since the 1950s as they became independent from their colonial masters.

The Long History in High-income Countries, Briefly

Britain was the first country to have an industrial revolution. Prior to that revolution—from the late 1100s to the 1660s—Britain used export taxes and licenses to prevent domestic food prices from rising excessively. But during 1660–90 a series of Acts gradually raised food import duties (making imports prohibitive under most circumstances) and reduced export restrictions on grain. These provisions were made even more protective of British farmers by the Corn Laws of 1815. True, the famous repeal of the Corn Laws in the mid-1840s heralded a period of relatively unrestricted food trade for Britain, but then agricultural protection returned in the 1930s and steadily increased over the next five decades.

Similar tendencies have been observed in many other West European countries, although on the Continent the period of free trade in the 19th century was considerably shorter, and agricultural protection levels during the past 150 years have been somewhat higher on average than in Britain. Kindleberger (1975) describes how the 19th-century free-trade movements in Europe reflected the national economic, political, and sociological conditions of the time. Agricultural trade reform was less difficult for countries such as Britain with overseas territories that could provide the metropolis with a ready supply of farm products. The fall in the price of grain imports from America in the 1870s and 1880s provided a challenge for all, however. Denmark coped well by moving more into livestock production to take advantage of cheaper grain. Italians coped by sending many of their relatives to the New World. Farmers in France and Germany successfully sought protection from imports, however, and so began the post-Industrial Revolution growth of agricultural protectionism in densely populated countries. Meanwhile, tariffs on West European imports of manufactures were progressively reduced after the General Agreement on Tariffs and Trade (GATT) came into force in the late 1940s, thereby adding to the encouragement of agricultural relative to manufacturing production (Lindert 1991; Findlay and O'Rourke 2007).

Japan provides an even more striking example of the tendency to switch from taxing to increasingly assisting agriculture relative to other industries. Its industrialization began later than in Europe, after the opening up of the economy following the Meiji Restoration in 1868. By 1900 Japan had switched from being a small net exporter of food to becoming increasingly dependent on imports of rice (its main staple food and responsible for more than half the value of domestic food production). This was followed by calls from farmers and their supporters for
rice import controls. Their calls were matched by equally vigorous calls from manufacturing and commercial groups for unrestricted food trade, since the price of rice at that time was a major determinant of real wages in the non-farm sector. The heated debates were not unlike those that led to the repeal of the Corn Laws in Britain six decades earlier. In Japan, however, the forces of protection triumphed, and a tariff was imposed on rice imports from 1904. That tariff then gradually rose over time, raising the domestic price of rice to more than 30 percent above the import price during World War I. Even when there were food riots because of shortages and high rice prices just after that war, the Japanese government's response was not to reduce protection but instead to extend it to its colonies and to shift from a national to an imperial policy of rice self-sufficiency. That involved accelerated investments in agricultural development in the colonies of Korea and Taiwan behind an ever-higher external tariff wall that by the latter 1930s had driven imperial rice prices to more than 60 percent above those in international markets (Anderson and Tyers 1992). After the Pacific War ended and Japan lost its colonies, its agricultural protection growth resumed and spread from rice to an ever-wider range of farm products.

The other high-income countries were settled by Europeans relatively recently and are far less-densely populated. They therefore have had a strong comparative advantage in farm products for most of their history following Caucasian settlement, and so have felt less need to protect their farmers than Europe or north-east Asia. Indeed Australia and New Zealand until the late 20th century tended—like developing countries—to adopt policies that discriminated against their farmers (Anderson, Lloyd and MacLaren 2007).

Developing Countries since the 1950s

In the Republic of Korea and Taiwan, China in the 1950s, as in many newly independent developing countries, initially adopted an import-substituting industrialization strategy which harmed agriculture. But in those two economies that policy was replaced in the early 1960s with a more neutral trade policy that resulted in very rapid export-oriented industrialization. That development strategy in those densely populated economies imposed competitive pressure on the farm sector which, just as in Japan in earlier decades, prompted farmers to lobby (successfully, as it happened) for ever-higher levels of protection from import protection (Anderson and Hayami 1986, ch. 2).

Many less-advanced and less-rapidly growing developing countries not only adopted import-substituting industrialization strategies in the late 1950s or early 1960s (Little, Scitovsky, and Scott 1970; Balassa and Associates 1971) but also imposed direct taxes on their exports of farm products. The latter practice was especially rife in Africa (Bates 1981). It was common in the 1950s and 1960s,
and in some cases even in the 1970s and 1980s, also to use dual or multiple exchange rates so as to tax indirectly both exporters and importers (Bhagwati 1978; Krueger 1978). This added to the anti-trade bias of developing countries' trade policies. That policy history is now well known, and has been documented extensively in previous surveys (for example Krueger 1984).

Less well-known is the extent to which many emerging economies have belatedly followed the examples of Korea and Taiwan in abandoning import-substitution and opening their economies. Some (for example Chile) started in the 1970s, while others (for example India) did not do so in a sustained way until the 1990s. Some have adopted a very gradual pace of reform, with occasional reversals, while others have moved rapidly to open markets. Some have reduced export taxes but simultaneously raised import barriers. And some have adopted the rhetoric of reform but in practice have done little to free up their economies. To get a clear sense of the overall impact of these reform attempts, there is no substitute for empirical analysis that quantifies over time the types of indicators raised in the theory section above. Building on recent work by the International Food Policy Research Institute (IFPRI) and the OECD (Orden and others 2007; OECD 2007), a World Bank project recently undertook such analysis, to which we now turn.

National Distortions to Farmer Incentives: Empirical Estimates post-World War II

After post-World War II reconstruction, Japan continued to raise its agricultural protection, just as had been happening in Western Europe, but to even higher levels. Domestic prices exceeded international market prices for grains and livestock products in both Japan and the European Community in the 1950s, but by less than 40 percent. By the early 1980s the difference was more than 80 percent for Japan but was still around 40 percent for the EC—and was still close to zero for the agricultural-exporting rich countries of Australasia and North America (Anderson and Hayami 1986, table 2.5). Virtually all of that assistance to Japanese and European farmers in that period was due to restrictions on imports of farm products.

Since 1986 the OECD (2008) has been computing annual producer and consumer support estimates by member countries. For the OECD member countries as a whole, producer support rose between 1986–88 and 2005–07 in US dollar terms (from $239 to $263 billion) but has come down when expressed as a share of support-inclusive returns to farmers (from 37 to 26 percent). Because of some switching of support instruments, including switching to measures that are based on non-current production or on long-term resource retirement, the share of that assistance provided via market price support measures has fallen from three-quarters to one-half. When the PSE payment is expressed as a percentage of undistorted
prices to make it an NRA, the NRA fall is from 59 to 35 percent between 1986–88 and 2005–07 (OECD 2008). This indicator suggests high-income country policies have become considerably less trade–distorting, at least in proportional terms, even though farmer support in high-income countries has continued to grow in dollar terms because of growth in the value of their farm output.

As for developing countries outside north-east Asia, the main comprehensive set of pertinent estimates over time is for the period just prior to when reforms became widespread. They were generated as part of a major study of 18 developing countries from the 1960s to the mid-1980s by Krueger, Schiff, and Valdés (1988, 1991). That study by the World Bank, whose estimates are summarized in Schiff and Valdés (1992), shows that the depression of incentives facing farmers has been due only partly to various forms of agricultural price and trade policies, including subsidies to food imports. Much more important in many cases have been those developing countries’ non-agricultural policies that hurt their farmers indirectly. The two key ones have been manufacturing protectionism (which attracts resources from agriculture to the industrial sector) and overvalued exchange rates (which attract resources to sectors producing non-tradables, such as services). That indirect impact was negative for all four groups of countries shown in table 1, whereas the impact of direct agricultural policies was negative only for the two lowest-income country groups. In addition to the total assistance being more negative the poorer the country group, table 1 also reveals that it is lower for producers of exportables than for the subsector focused on import-competing farm products, suggesting a strong anti-trade bias for the sector as a whole.

Since there were no comprehensive multiregion studies of the Krueger, Schiff, and Valdés type for developing countries that monitored progress over the subsequent reform period, a new study was recently launched by the World Bank aimed at filling this lacuna. The new study covers not only 41 developing countries but also 14 European transition economies as well as 20 high-income countries. The results from that study do indeed reveal that there has been a substantial reduction in distortions to agricultural incentives in developing countries over the past two to three decades. They also reveal that progress has not been uniform across countries and regions, and that—contrary to some earlier claims (for example from Jensen, Robinson, and Tarp 2002)—the reform process is far from complete. In particular, many countries still have a wide dispersion in NRAs for different farm industries and in particular have a strong anti-trade bias in the structure of assistance within their agricultural sector; and some countries have “overshot” in the sense that they have moved from having an average rate of assistance to farmers that was negative to one that is positive, rather than stopping at the welfare-maximizing rate of zero. Moreover, the variance in rates of assistance across commodities within each country, and in aggregate rates across countries, remains substantial; and the beggar-thy-neighbor
Table 1. Direct and Indirect Nominal Rates of Assistance to Farmers in 18 Developing Countries, 1960 to mid-1980s (percent)

<table>
<thead>
<tr>
<th>Country group</th>
<th>Direct assistance</th>
<th>Indirect assistance</th>
<th>Total assistance&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Assistance to agric. export subsector&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Assistance to agric. import-competing subsector&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low income</td>
<td>-23</td>
<td>-29</td>
<td>-52</td>
<td>-49</td>
<td>-11</td>
</tr>
<tr>
<td>Low income</td>
<td>-12</td>
<td>-24</td>
<td>-36</td>
<td>-40</td>
<td>-13</td>
</tr>
<tr>
<td>Lower middle income</td>
<td>0</td>
<td>-16</td>
<td>-16</td>
<td>-14</td>
<td>-2</td>
</tr>
<tr>
<td>Upper middle income</td>
<td>24</td>
<td>-14</td>
<td>10</td>
<td>-1</td>
<td>15</td>
</tr>
<tr>
<td>Unweighted sample average</td>
<td>-8</td>
<td>-22</td>
<td>-30</td>
<td>-35</td>
<td>-9</td>
</tr>
</tbody>
</table>

<sup>a</sup> Total assistance is the weighted average of assistance to the agricultural subsectors producing exportables, importables, and non-tradables (the latter not shown above).

<sup>b</sup> Source: Anderson (forthcoming a), summarized from estimates reported in Schiff and Valdés (1992, tables 2.1 and 2.2).

practice of insulating domestic markets from international food price fluctuations continues, thereby exacerbating that volatility.

The global summary of those new results is provided in figure 1. It reveals that the nominal rate of assistance (NRA) to farmers in high-income countries rose steadily over the post-World War II period through to the end of the 1980s, apart from a small dip when international food prices spiked around 1973–74. After peaking at more than 50 percent in the mid-1980s, the average NRA for high-income countries has fallen a little, depending on the extent to which one believes some new farm programs are “decoupled” in the sense of no longer influencing production decisions. For developing countries, too, the average NRA for agriculture has been rising, but from a level of around -25 percent during the period from the mid-1950s to the early 1980s to a level of nearly 10 percent in the first half of the present decade. Thus the global gross subsidy equivalent of those rates of assistance have risen very substantially in constant (2000) US dollar terms, from close to zero up to the mid-1970s to more than $200 billion per year at the farm gate since the mid-1990s (figure 2).

When expressed on a per farmer basis, the gross subsidy equivalent (GSE) varies enormously between high-income and developing countries. In 1980–84 the GSE in high-income countries was already around $8,000 and by 2000–04 it had risen to $10,000 on average and $25,000 in Norway, Switzerland, and Japan, or $13,500 when “decoupled” payments are included. By contrast, the GSE in developing economies was -$140 per farmer in the first half of the 1980s, which is a non-trivial tax when one recalls that at that time the majority
**Figure 1.** Nominal Rates of Assistance to Agriculture in High-income and European Transition Economies and in Developing Countries, 1955 to 2004 (percent, weighted averages, with “decoupled” payments included in the dashed higher income countries line)

![Graph showing nominal rates of assistance to agriculture](image)

*Source: Anderson (2009).*

**Figure 2.** Gross Subsidy Equivalent of NRAs in High-income and European Transition Economies and in Developing Countries, 1960 to 2007 (constant 2000 US$ billion)

![Graph showing gross subsidy equivalent](image)

*Source: Anderson (2009).*

*Anderson* 33
of these people’s households were surviving on less than $1 a day per capita. By 2000–04 they received on average around $50 per farmer (Anderson 2009, ch. 1). While this represents a major improvement, it is less than 1 percent of the support received by the average farmer in high-income countries.

The developing economies of Asia—including Korea and Taiwan, which were both very poor at the start of the period—have experienced the fastest transition from negative to positive agricultural NRAs. Latin American economies first increased their taxation of farmers but gradually moved during the mid-1970s to the mid-2000s from around −20 percent to 5 percent. Africa’s NRAs were similar though slightly less negative than those of Latin America until the latter 1980s, before they fell back to −7 percent (implying a gross tax equivalent per farmer of $6). In Europe’s transition economies farmer assistance fell to almost zero at the start of their transition from socialism in the early 1990s; but since then, in preparation for EU accession or because of booms in exports of raw materials for energy production, assistance has gradually increased to nearly 20 percent, or $550 per farmer (Anderson 2009, ch. 1).

The developing country average NRA also conceals the fact that the exporting and import-competing subsectors of agriculture have very different NRAs. Figure 3 reveals that while the average NRA for exporters in developing countries has been negative throughout (coming back from −50 percent to almost zero in 2000–04), the NRA for import-competing farmers in developing countries has fluctuated around a trend rise from 10 and 30 percent (and it even reached 40 percent in the years of low international prices in the mid-1980s). Having increased in the 1960s and 1970s, the anti-trade bias within agriculture for developing countries has diminished considerably since the mid-1980s, but the NRA gap between the two subsectors still averages around 20 percentage points.

That anti-trade bias means that the rates of assistance are not uniform across commodities, which indicates that the resources that are being used within the farm sector are not being put to their best use. The extent of that extra inefficiency, over and above that due to too many or too few resources in aggregate in the sector, is indicated by the standard deviation of NRAs among covered products in each focus country. This dispersion index has fluctuated between 43 and 60 percent throughout the past five decades, with no discernible trend (Anderson 2009, table 1.6). Figure 4 shows that rice, sugar, and milk (the rice pudding ingredients) are by far the most assisted farm industries in both high-income and developing countries. Beef and poultry meat have the next highest NRAs in high-income countries followed by cotton—while in developing countries cotton has the lowest (most negative) NRA.

A further decomposition of the developing countries’ NRAs worth commenting on is the contribution to them from trade policy measures at each country’s border as distinct from domestic output or input subsidies or taxes. Often political attention is focused much more on direct domestic subsidies or taxes than on
Trade measures, because those fiscal measures are made so transparent through the annual budgetary scrutiny process, whereas trade measures are reviewed only infrequently and are far less transparent, especially if they are not in the simple form of \textit{ad valorem} tariffs. That attention would appear to be misplaced, however, because between 80 and 90 percent of the NRA for developing country agriculture (not including non-product-specific support, which is very minor) comes from border measures such as import tariffs or export taxes (Anderson 2009, ch. 1).

The improvement in farmers' incentives in developing countries is understated by the above NRAag estimates, because those countries have also reduced their
assistance to producers of non-agricultural tradable goods, most notably manufacturers. The decline in the weighted average NRA for the latter, depicted in figure 5, was clearly much greater than the increase in the average NRA for tradable agricultural sectors for the period to the mid-1980s, consistent with the finding of Krueger, Schiff, and Valdés (1988, 1991). For the period since the mid-1980s, changes in both sectors' NRAs have contributed almost equally to the improvement in farmer incentives. The Relative Rate of Assistance, captured in equation (6) above, provides a useful indicator of relative price change: the RRA for developing countries as a group went from 46 percent in the second half of the 1970s to 1 percent in the first half of the present decade. This increase (from a coefficient of 0.54 to 1.01) is equivalent to an almost doubling in the relative price of farm products, which is a huge change in the fortunes of developing country farmers in just a generation. This is mostly because of the changes in Asia, but even for Latin America that relative price hike is one-half, while for Africa that indicator improves by only one-eighth (figure 6).

One of the main contributors to the Asian changes is China, and a non-trivial part of its reform came through reducing its overvalued official exchange rate. There, as in some other developing countries, the distortion in the domestic market for foreign currencies was gradually reduced in an indirect way, namely, by allowing exporters to sell an increasing share of their foreign currency earnings on a higher-priced secondary market. This lowered the trade tax equivalent of that distortion over time, and hence its impact on the NRA for farm and non-

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Source: Anderson and Valenzuela (2008), based on estimates reported in the project’s national country studies.
Figure 5. Nominal Rates of Assistance to Agricultural and Non-agricultural Sectors and Relative Rate of Assistance, a Developing Countries, 1965b to 2004 (percent, weighted averages)

[Graph showing the changes in nominal rates of assistance from 1965 to 2004 for agricultural and non-agricultural sectors.]

*a The RRA is defined as \(100\times\left[\frac{100 + \text{NRA}_{\text{ag}}}{100 + \text{NRA}_{\text{nonag}}} - 1\right]\), where \(\text{NRA}_{\text{ag}}\) and \(\text{NRA}_{\text{nonag}}\) are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

b Assumes China’s NRA values pre-1981 were the same as in 1981–84.

Source: Anderson (2009).

Figure 6. Relative Rates of Assistance to Tradables, a Asia, Africa and Latin America, 1965 to 2004 (percent)

[Graph showing the changes in relative rates of assistance from 1965 to 2004 for Asia, Africa, and Latin America.]

*a Five-year weighted averages with value of production at undistorted prices as weights. In Asia, estimates for China pre-1981 are based on the assumption that the nominal rate of assistance to agriculture and non-agricultural tradables, and hence the RRA in those earlier years, were the same as the average NRA estimates for China in 1981–89.

Source: Anderson (2009).
Table 2. Impact of Exchange Rate Distortions on Nominal Rates of Assistance to Agricultural Relative to Non-agricultural Industries, China, 1981 to 2004 (percent)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Including exchange rate distortions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NRA, all agric. products (excl. NPS)</td>
<td>−47.6</td>
<td>−37.9</td>
<td>−17.2</td>
<td>3.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Trade bias index, all agric.</td>
<td>−50</td>
<td>−55</td>
<td>−23</td>
<td>−15</td>
<td>−7</td>
</tr>
<tr>
<td>Relative rate of assistance, RRA</td>
<td>−60.6</td>
<td>−49.9</td>
<td>−31.1</td>
<td>−3.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Ignoring exchange rate distortions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NRA, all agric. products (excl. NPS)</td>
<td>−34.9</td>
<td>−27.1</td>
<td>−11.6</td>
<td>3.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Trade bias index, all agric.</td>
<td>−33</td>
<td>−38</td>
<td>−13</td>
<td>−15</td>
<td>−7</td>
</tr>
<tr>
<td>Relative rate of assistance, RRA</td>
<td>−52.2</td>
<td>−41.0</td>
<td>−26.5</td>
<td>−3.0</td>
<td>1.3</td>
</tr>
</tbody>
</table>

a Trade bias index is \(100\left[1 + \frac{\text{NRA}_{\text{ag}}}{1 + \text{NRA}_{\text{m}}}\right] - 1\), where \(\text{NRA}_{\text{ag}}\) and \(\text{NRA}_{\text{m}}\) are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

b The RRA is defined as \(100\left[100 + \frac{\text{NRA}_{\text{ag}}}{100 + \text{NRA}_{\text{nonag}}}\right] - 1\), where \(\text{NRA}_{\text{ag}}\) and \(\text{NRA}_{\text{nonag}}\) are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

c Here is shown how the average NRA, trade bias index, and RRA would be affected if the distortions in the market for foreign currency, as captured by the methodology outlined in Anderson and others (2008), are ignored.

NPS: non-product-specific assistance.

Source: Summarized from Huang and others (2009).

farm sectors, depending on the changing extent to which they are net-exporting or net-importing sectors. The impact of China’s dual exchange rate system is shown in Table 2; it made the RRA estimates about one-fifth larger in the mid-1980s, but that difference gradually fell to zero by the mid-1990s.

Finally, even though the developing country average agricultural NRA and RRA are now close to zero, and those for high-income countries have been moving towards zero since the late 1980s, there remains a huge spectrum of national averages (Figure 7). This suggests there is still a great deal to be gained through international relocation of farm production between countries. That possibility, together with the possibility of gains from reducing the dispersion between product NRAs within countries, can best be explored with the use of a global economy-wide model. Attention thus now turns to estimates of the market, welfare and distributional effects of the distortions to agricultural incentives that remain in both high-income and poorer countries. This is done using a global model calibrated to 2004.

**Market, Welfare, and Distributional Effects of Remaining Trade-distorting Policies**

The new World Bank distortion estimates summarized above and available in downloadable detail (Anderson and Valenzuela 2008) show that while average
Figure 7. Cross-country Dispersion of NRA (All Agriculture Products, including NPS) and RRA, 2000–04 (percent)

Source: Anderson and Valenzuela (2008), based on estimates reported in the project’s national country studies.

distortions facing developing country farmers are now much less than in earlier decades, nonetheless there remains a considerable range of distortions, including a strong anti-trade bias in agricultural policies for many countries. Furthermore, non-agricultural protectionism is still rife in some developing countries and
This section addresses two questions: To what extent are government trade and subsidy policies still reducing farm incomes in developing countries and thereby prolonging inequality across countries in farm household incomes? And are those policy-induced price distortions depressing value added more in primary agriculture than in the rest of the economy of developing countries, thereby potentially raising inequality and poverty within those countries? With farm incomes well below non-farm incomes in most developing countries, and with agriculture there being intensive in the use of unskilled labor, policies that lower agricultural relative to non-agricultural value added, and wages for the unskilled relative to skilled wages and capital earnings, would tend to exacerbate inequality and poverty.

Answers to these two questions are provided in Anderson, Valenzuela, and van der Mensbrugghe (forthcoming). They first draw on the above-mentioned new database of distortions to agricultural markets in developing countries to amend the latest Global Trade Analysis Project (GTAP) protection database (pre-release Version 7.5, which refers to 2004). They then employ that amended database in a global computable general equilibrium model (LINKAGE—see van der Mensbrugghe 2005) to assess how agricultural markets, factor prices, and value added in agriculture versus non-farm sectors would change if all such distortionary policies were removed (holding aggregate government taxes and spending constant by use of a lump-sum consumption tax). The comparative static results (assuming full adjustment) are presented first for the key regions of the world, beginning with national economic welfare where the impact of agricultural versus non-farm policies is highlighted. While no-one anticipates a move to completely free markets in the near future, the analysis serves as a benchmark to suggest what is at stake in terms of further reforms, either unilaterally or via World Trade Organization (WTO) rounds of multilateral trade negotiations. It also provides a better indication of agricultural comparative advantages in different parts of the world than is available by looking at actual trade and self-sufficiency indicators in the current distortion-ridden situation.

According to the amended dataset, the average import-weighted applied tariff for agriculture and lightly processed food in 2004 was 11 percent for high-income countries and 14 percent for developing countries, while for non-farm goods it was 7 percent for developing countries and just 1 percent for high-income countries. Export subsidies for farm products exist for a few high-income regions, and export taxes are still in place in a few developing countries (notably Argentina since late 2001). Production subsidies and taxes also are much less prevalent than import tariffs, even though they include, in the case of developing
Table 3. Import Tariffs and Production and Export Subsidies or Taxes for Agriculture, and Import Tariffs for Other Merchandise, by Region, 2004 (percent)\(^a\)

<table>
<thead>
<tr>
<th>Region</th>
<th>Agriculture and lightly processed foods</th>
<th>Other manufacturing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Import tariff</td>
<td>Export subsid</td>
<td>Production subsid</td>
</tr>
<tr>
<td>North Africa</td>
<td>14.4</td>
<td>-1.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>18.6</td>
<td>0.1</td>
<td>-1.7</td>
</tr>
<tr>
<td>East Asia</td>
<td>17.2</td>
<td>-0.5</td>
<td>-0.2</td>
</tr>
<tr>
<td>South Asia</td>
<td>21.2</td>
<td>-0.4</td>
<td>-0.4</td>
</tr>
<tr>
<td>Latin America</td>
<td>12.1</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Middle East</td>
<td>6.8</td>
<td>-4.4</td>
<td>0.1</td>
</tr>
<tr>
<td>E. Europe and Central Asia (ECA)</td>
<td>8.6</td>
<td>0.0</td>
<td>-8.6</td>
</tr>
<tr>
<td><strong>High-income countries</strong></td>
<td>10.8</td>
<td>3.9</td>
<td>-0.1</td>
</tr>
<tr>
<td><strong>High-income plus ECA</strong></td>
<td>11.1</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>World total</strong></td>
<td>12.5</td>
<td>0.4</td>
<td>0.5</td>
</tr>
</tbody>
</table>

\(^a\) Weighted averages using imports, exports, or production at undistorted prices as weights.

\(^b\) Negative if a tax.

Source: Valenzuela, van der Mensbrugghe, and Anderson (2009).

countries, the output subsidy or tax equivalents of any subsidies or taxes on purchased farm inputs (table 3).

**Global and National Economic Welfare Effects**

The LINKAGE model's 2004 baseline of the world economy is first compared with a simulation in which all agricultural subsidies or taxes plus import tariffs on other merchandise, as summarized in table 3, are removed. That removal would lead to a global gain of $192 billion per year.\(^9\) The distribution across regions of that economic welfare (or equivalent variation in income) gain, reported in table 4, suggests two-thirds of those dollars would accrue to high-income countries. However, as a share of national income, developing countries would gain more, with an average increase of 0.8 percent compared with 0.5 percent for high-income countries. The results vary widely across developing countries, ranging from slight losses in the case of some South Asian and Sub-Saharan African countries who suffer exceptionally large adverse terms of trade changes, to several percentage point gains in other cases.

The second column of numbers and those in parentheses in table 4 show the amount of that welfare gain due to changes in the international terms of trade for each country. For developing countries as a group, the effect of the terms of trade change on their welfare is negative, reducing somewhat the gains from improved efficiency of domestic resource use.
Table 4. Impact on Real Income from Full Liberalization of Global Merchandise Trade, by Region, 2004 (relative to the benchmark data, in 2004 US dollars and percent)

<table>
<thead>
<tr>
<th>Region</th>
<th>Total real income gain (billion)</th>
<th>Change in income due just to change in terms of trade (billion)</th>
<th>Total real income gain as percentage of benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td>67.8</td>
<td>-17.8</td>
<td>0.8 (-0.2)</td>
</tr>
<tr>
<td>North Africa</td>
<td>7.5</td>
<td>-3.2</td>
<td>3.4 (-1.4)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>-0.1</td>
<td>-2.5</td>
<td>0.0 (-0.6)</td>
</tr>
<tr>
<td>East Asia</td>
<td>30.5</td>
<td>-5.2</td>
<td>0.9 (-0.2)</td>
</tr>
<tr>
<td>South Asia</td>
<td>-4.9</td>
<td>-3.5</td>
<td>-0.7 (-0.5)</td>
</tr>
<tr>
<td>Latin America</td>
<td>16.0</td>
<td>0.1</td>
<td>0.9 (0.0)</td>
</tr>
<tr>
<td>Middle East</td>
<td>4.8</td>
<td>-0.5</td>
<td>0.7 (-0.1)</td>
</tr>
<tr>
<td>E. Europe and Central Asia (ECA)</td>
<td>14.2</td>
<td>-3.1</td>
<td>1.0 (-0.2)</td>
</tr>
<tr>
<td>High-income countries</td>
<td>124.7</td>
<td>16.9</td>
<td>0.5 (0.1)</td>
</tr>
<tr>
<td>High-income plus ECA</td>
<td>138.9</td>
<td>13.8</td>
<td>0.5 (0.1)</td>
</tr>
<tr>
<td>World total</td>
<td>192.5</td>
<td>-0.9</td>
<td>0.6 (0.0)</td>
</tr>
</tbody>
</table>

* Numbers in parentheses refer to that due to terms of trade effects.  
  Source: Valenzuela, van der Mensbrugghe, and Anderson (2009).

Regional and Sectoral Distribution of Welfare Effects

There are several ways to decompose the real income gains from full removal of price distortions globally so as to better understand the sources for each region. One way is to assess the impacts of developing country liberalization versus high-income country liberalization in different economic sectors. That decomposition suggests global liberalization of agriculture and food markets contributes 66 percent of the total global gains from merchandise reform. This is the same as Hertel and Keeney (2006) found for 2001 using the GTAP Model, and similar to the 63 percent found for 2015 by Anderson, Martin, and van der Mensbrugghe (2006) using the LINKAGE Model. This robust "two-thirds" result is due to the high tariffs in agriculture and food versus other sectors shown in table 3, but is nonetheless remarkable given the low shares of agriculture and food in global GDP and global merchandise trade (less than 9 percent). For developing countries, the importance of agricultural policies is even greater at 70 percent, compared with 64 percent for high-income countries.

Quantities Produced and Traded

The full liberalization results suggest there would be little change in the developing countries' aggregate shares of global output and exports of non-farm products other than apparel. Their shares in agricultural and food markets, however,
change noticeably: the export share rises from 54 to 64 percent and the output share rises from 50 to 53 percent. More significantly, the rises occur in nearly all agricultural industries. As a result, the share of global production of farm products that is exported rises dramatically for many industries and, for the sector as a whole, increases from 7 to 12 percent excluding intra-EU trade (table 5). That “thickening” of international food markets would have a substantial dampening effect on the instability of prices in those markets.

The impact of full trade reform on global farm trade is to enhance it by more than one-third, whereas the global value of output is virtually unchanged, dropping just 2 percent. This suggests that, in aggregate, the pro-agricultural policies of high-income countries are not quite fully offset by the anti-agricultural policies of developing countries—whereas the anti-trade biases in policies of both groups of countries reinforce each other. The increase in exports of those goods from developing countries would be a huge $158 billion per year. Latin America accounts for nearly half of that projected increase, but all developing regions’ exports would expand. The share of production exported would increase for almost all major developing countries, rising in aggregate from 8 to 15 percent.

**Effects on Factor Rewards**

The relatively small percentage changes in net national economic welfare, reported in table 4, hide the fact that redistributions of welfare among groups within each country following trade reform can be much larger. This is clear from the impacts on real rewards to labor, capital, and land that are reported in table 6, where factor rewards are deflated by the overall consumer price index (CPI). It happens that food prices would fall more than the overall CPI index; so insofar as unskilled workers spend a higher share of their income on food than others, these results underestimate the extent of their gain. The results also support the expectation from trade theory that returns to unskilled labor in developing countries rise most, followed by wages of skilled workers, which in turn rise more than the earnings from produced capital. Returns to immobile agricultural land also rise in developing countries, but by less than for more mobile factors. That suggests it is necessary to drill down more to see what happens to returns from farming in aggregate to get a clearer idea of whether full reform would be likely to improve equity and reduce poverty in developing countries (bearing in mind that the vast majority of their poor earn income as farmers and unskilled laborers).

**Effects on Sectoral Value Added**

Of crucial interest in terms of these policies’ impact on inequality and poverty is how they affect value added in agriculture, in other words net farm income
Table 5. Impact of Full Global Liberalization on Shares of Global Output Exported, and Developing Country Shares of Global Output and Exports*, by Product, 2004 (percent)

<table>
<thead>
<tr>
<th></th>
<th>Share of global output exported</th>
<th>Developing countries' share of global output</th>
<th>Developing countries' share of global exports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Benchmark</td>
<td>Full liberalization</td>
<td>Benchmark</td>
</tr>
<tr>
<td>Paddy rice</td>
<td>1</td>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>Wheat</td>
<td>14</td>
<td>19</td>
<td>75</td>
</tr>
<tr>
<td>Other grains</td>
<td>10</td>
<td>13</td>
<td>70</td>
</tr>
<tr>
<td>Oil seeds</td>
<td>20</td>
<td>27</td>
<td>70</td>
</tr>
<tr>
<td>Plant-based fibers</td>
<td>24</td>
<td>22</td>
<td>72</td>
</tr>
<tr>
<td>Vegetables and fruits</td>
<td>9</td>
<td>14</td>
<td>73</td>
</tr>
<tr>
<td>Other crops</td>
<td>11</td>
<td>14</td>
<td>53</td>
</tr>
<tr>
<td>Cattle, sheep, and so on</td>
<td>2</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Other livestock</td>
<td>3</td>
<td>4</td>
<td>68</td>
</tr>
<tr>
<td>Wool</td>
<td>10</td>
<td>12</td>
<td>77</td>
</tr>
<tr>
<td>Beef and sheep meat</td>
<td>6</td>
<td>19</td>
<td>30</td>
</tr>
<tr>
<td>Other meat products</td>
<td>6</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>Vegetable oils and fats</td>
<td>19</td>
<td>28</td>
<td>52</td>
</tr>
<tr>
<td>Dairy products</td>
<td>4</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>Processed rice</td>
<td>4</td>
<td>7</td>
<td>78</td>
</tr>
<tr>
<td>Refined sugar</td>
<td>7</td>
<td>38</td>
<td>57</td>
</tr>
<tr>
<td>Other food, beverages</td>
<td>8</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>All agriculture and food</td>
<td>7</td>
<td>12</td>
<td>50</td>
</tr>
<tr>
<td>Agriculture</td>
<td>7</td>
<td>10</td>
<td>67</td>
</tr>
<tr>
<td>Processed foods</td>
<td>8</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>Other primary products</td>
<td>30</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>Textile and wearing apparel</td>
<td>27</td>
<td>34</td>
<td>55</td>
</tr>
<tr>
<td>Other manufacturing</td>
<td>24</td>
<td>26</td>
<td>37</td>
</tr>
<tr>
<td>Services</td>
<td>3</td>
<td>3</td>
<td>21</td>
</tr>
</tbody>
</table>

* Excluding intra-EU15 trade.

Source: Valenzuela, van der Mensbrugghe, and Anderson (2009)
Table 6. Impacts of Full Global Merchandise Trade Liberalization on Real Factor Prices,\textsuperscript{a} 2004 (relative to the benchmark data, percent)

<table>
<thead>
<tr>
<th></th>
<th>Unskilled wages</th>
<th>Skilled wages</th>
<th>Capital\textsuperscript{b} user cost</th>
<th>Land\textsuperscript{b} user cost</th>
<th>Aggregate CPI</th>
<th>Food CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td>3.8</td>
<td>3.5</td>
<td>3.1</td>
<td>1.6</td>
<td>-1.0</td>
<td>-2.7</td>
</tr>
<tr>
<td>North Africa</td>
<td>10.7</td>
<td>13.7</td>
<td>9.9</td>
<td>0.3</td>
<td>-9.0</td>
<td>-16.5</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>3.3</td>
<td>3.3</td>
<td>3.9</td>
<td>-0.2</td>
<td>-3.9</td>
<td>-5.4</td>
</tr>
<tr>
<td>East Asia</td>
<td>4.6</td>
<td>4.1</td>
<td>4.0</td>
<td>2.0</td>
<td>0.0</td>
<td>-2.8</td>
</tr>
<tr>
<td>South Asia</td>
<td>-0.7</td>
<td>2.4</td>
<td>0.6</td>
<td>-5.4</td>
<td>-0.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Latin America</td>
<td>4.6</td>
<td>2.3</td>
<td>1.4</td>
<td>16.3</td>
<td>0.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Middle East</td>
<td>6.9</td>
<td>2.8</td>
<td>4.7</td>
<td>37.4</td>
<td>-2.8</td>
<td>-9.9</td>
</tr>
<tr>
<td>E. Europe and Central</td>
<td>1.7</td>
<td>3.1</td>
<td>2.4</td>
<td>-3.6</td>
<td>-2.0</td>
<td>-3.7</td>
</tr>
<tr>
<td>High-income countries</td>
<td>0.3</td>
<td>1.0</td>
<td>0.6</td>
<td>-21.3</td>
<td>-0.9</td>
<td>-4.1</td>
</tr>
<tr>
<td>High-income plus ECA</td>
<td>0.3</td>
<td>1.1</td>
<td>0.7</td>
<td>-15.8</td>
<td>-1.0</td>
<td>-4.1</td>
</tr>
<tr>
<td>World total</td>
<td>1.0</td>
<td>1.4</td>
<td>1.4</td>
<td>-3.4</td>
<td>-0.9</td>
<td>-3.5</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Nominal factor prices deflated by the consumer price index (CPI).
\textsuperscript{b} The user cost of capital and land represents the subsidy inclusive rental cost.

Source: Valenzuela, van der Mensbrugghe, and Anderson (2009).

or gross income minus purchased farm inputs. For poverty it matters how much that indicator changes in absolute terms, while for inequality it matters also how much it changes relative to value added in non-farm sectors (which is a proxy for incomes of non-farm households). These results for full global reform, reported in table 7, show that for developing countries as a group, real value added in agriculture (net farm income) would rise by 5.2 percent, compared with 2.1 percent for non-agriculture. Latin America is where net farm income expands most, averaging 29 percent. In East Asia it also expands considerably, and twice as much as non-agricultural value added. However, in Africa net farm incomes would increase substantially only in Mozambique, Zambia, and Zimbabwe, and for the continent as a whole they would fall very slightly (by less than 1 percent). Partly that fall is because non-agricultural primary sectors—in which numerous African countries have a strong comparative advantage—would expand (raising self-sufficiency in that sector from 182 to 191 percent), and that in turn would boost non-tradables production and employment. Net farm incomes are estimated to fall also in South Asia (by 5 percent), but there it is textiles and clothing that expand (raising self-sufficiency from 144 to 153 percent) and, in India where the skilled or unskilled wage differential rises, skill-intensive goods and service sectors also expand.
Table 7. Effects on Agricultural and Non-agricultural Sectoral Value Added of Full Global Liberalization and Own-liberalization of Agricultural and All Sectors' Merchandise Trade Reform, 2004 (relative to benchmark data, percent)

<table>
<thead>
<tr>
<th>Global liberalization</th>
<th>Agricultural policies</th>
<th>All sectors’ policies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agric. value added</td>
<td>Non-ag. value added</td>
</tr>
<tr>
<td>Developing countries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Africa</td>
<td>5.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>East Asia</td>
<td>2.9</td>
<td>0.6</td>
</tr>
<tr>
<td>South Asia</td>
<td>-4.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Latin America</td>
<td>28.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Middle East</td>
<td>23.8</td>
<td>0.4</td>
</tr>
<tr>
<td>E. Europe and Central Asia (ECA)</td>
<td>-3.3</td>
<td>0.4</td>
</tr>
<tr>
<td>High-income countries</td>
<td>-13.9</td>
<td>0.2</td>
</tr>
<tr>
<td>High-income plus ECA</td>
<td>-11.2</td>
<td>0.2</td>
</tr>
<tr>
<td>World total</td>
<td>-1.0</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: Valenzuela, van der Mensbrugghe, and Anderson (2009).

Prospects for Further Reductions in Distortions

It is not obvious how future policies might develop. A quick glance at the above policy indicators could lead one to view developments from the early 1960s to the mid-1980s as an aberrant period of welfare-reducing policy divergence (negative and declining RRAs in low-income countries, positive and rising RRAs in most high-income countries) that has given way to welfare-improving and poverty-reducing reforms during which the two country groups’ RRAs are converging. But on inspection of the NRAs for exporting and import-competing subsectors of agriculture (figure 3), it is clear that the convergence of NRAs to near zero is mainly with respect to the exporting subsector, while NRAs for import-competing farmers are positive and trending upwards over time at the same rate in both developing and high-income countries—notwithstanding the Uruguay Round Agreement on Agriculture which was aimed at tariffifying and reducing import protection. True, applied tariffs have been lowered or suspended as a way of dealing with the international food price spike in 2008, but this, and the food export taxes or quantitative restrictions imposed that year by numerous food-exporting developing countries, may be only until international prices return to trend (as happened after the price hike of 1973–74 and the price dip of 1986–87).
The indications are very mixed as to why some countries appear to have reformed their price-distorting agricultural and trade policies more than others in recent decades, and why some have stubbornly resisted reform. Some reforming countries have acted unilaterally, apparently having become convinced that it is in their own national interest to do so. China is but the most dramatic and significant example of the past three decades among developing countries, while among the high-income countries only Australia and New Zealand are in that category. Others may have done so partly to secure bigger and better loans from international financial institutions and then, having taken that first step, they have continued the process, even if somewhat intermittently. India is one example, but there are numerous others in Africa and Latin America. Few have gone backwards in terms of increasing their anti-agricultural bias, but Zimbabwe and perhaps Argentina qualify during the present decade—and numerous others have joined them in 2008, at least temporarily, in response to the sudden upward spike in international food prices. And some have reduced their agricultural subsidies and import barriers at least partly in response to the GATT’s multilateral Uruguay Round Agreement on Agriculture, the European Union (EU) being the most important example (helped by its desire also for otherwise-costly preferential trade agreements, including its recent expansion eastwards).

The EU reforms suggest agricultural protection growth can be slowed and even reversed if accompanied by reinstrumentation away from price supports to decoupled measures or more direct forms of farm income support. The starker examples of Australia and New Zealand show that one-off buyouts can bring faster and even complete reform. But in the developing countries, where levels of agricultural protection are generally below high-income levels, there are fewer signs of a slowdown of the upward trend in agricultural protection from import competition over the past half-century.

Indeed, there are numerous signs that developing-country governments want to keep open their options to raise agricultural NRAs in the future, particularly via import restrictions. One indicator is the high tariff bindings developing countries committed themselves to following the Uruguay Round: as of 2001, actual applied tariffs on agricultural products averaged less than half the corresponding bound tariffs for developing countries of 48 percent, and less than one-sixth in the case of least-developed countries (Anderson and Martin 2006, table 1.2).

Another indicator of reluctance in agricultural trade reform is the unwillingness of many developing countries to agree to major cuts in bound agricultural tariffs in the WTO’s on-going Doha round of multilateral trade negotiations. Indeed, many of them believe high-income countries should commit to reducing their remaining farm tariffs and subsidies before developing countries should offer further reform commitments of their own. Yet modeling results reported in

Anderson
Anderson, Valenzuela, and van der Mensbrugghe (forthcoming) suggest that if high-income countries alone were to liberalize their agricultural markets, such a subglobal reform would provide less than two-thirds of the potential gains to developing countries that could come from global agricultural policy reform.

More than that, the current negotiations have brought to prominence a new proposal for agricultural protectionism in developing countries. This is based on the notion that agricultural protection is helpful and needed for food security, livelihood security, and rural development. This view has succeeded in bringing “Special Products” and a “Special Safeguard Mechanism” into the multilateral trading system’s agricultural negotiations, despite the fact that such policies, which would raise domestic food prices in developing countries, may worsen poverty and the food security of the poor (Ivanic and Martin 2008).

To wait for reform in high-income countries before liberalizing the farm trade of developing countries is unwise as a poverty alleviating strategy, not least because the past history revealed in the NRAs summarized above suggests that such reform will be at best slow in coming. In the US, for example, the most recent two five-year farm bills were steps backwards from the previous regime which at least sought to reinstrument protection toward less trade-distorting measures (Gardner 2009). Nor have the world’s large number of new regional integration agreements of recent years been very successful in reducing farm protection. Furthermore, for developing countries to postpone their own reform would be to forego a major opportunity to boost theirs and (given the size and growth in South–South trade of late) their neighbors’ economies. As Anderson and Winters (2009) argue, it would be doubly wasteful if, by being willing to commit to reform in that way, they would be able to convince high-income countries to reciprocate by signing on to a more ambitious Doha agreement, the potential global benefits from which are very considerable.

Developing countries that continue to free up domestic markets and practice good macroeconomic governance will keep growing, and typically the growth will be more rapid in manufacturing and service activities than in agriculture, especially in the more densely populated countries where agricultural comparative advantage is likely to decline. Whether such economies become more dependent on imports of farm products depends, however, on what happens to their RRAs. The first wave of Asian industrializers (Japan, and then Korea and Taiwan) chose to slow the growth of food import dependence by raising their NRA for agriculture even as they were bringing down their NRA for non-farm tradables, such that their RRA became increasingly above the neutral zero level. A key question is: will later industrializers follow suit, given the past close association of RRAs with rising per capita income and falling agricultural comparative advantage? Figure 8 suggests developing countries’ RRA trends of the past three decades have been on the same upward trajectory as the high-income countries
prior to the 1990s. So unless new forces affect their polities, the governments of later industrializing economies may well follow suit.

One potential new force is disciplines on farm subsidies and protection policies of WTO member countries following the Uruguay Round. Earlier industrializers were not bound under GATT to keep down their agricultural protection, and the legal constraints on developing countries have been even less constraining. For India, Pakistan, and Bangladesh, for example, their estimated NRAs for agricultural importables in 2000–04 are 34, 4, and 6 percent, respectively, whereas the average bound tariffs on their agricultural imports are 114, 96, and 189 percent, respectively (WTO, ITC, and UNCTAD 2007). Also, like other developing countries, they have high bindings on product-specific domestic supports of 10 percent and another 10 percent for non-product specific assistance, a total of 20 more percentage points of NRA (17 percent in China’s case) than legally could come from domestic support measures—compared with currently 10 percent in India and less than 3 percent in the rest of South Asia.

Hopefully developing countries will choose not to make use of the legal wiggle room they have allowed themselves in their WTO bindings to follow Japan, Korea, and Taiwan into high agricultural protection. A much more efficient and

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**Figure 8.** Relationships between Real GDP per capita and RRA. All Focus Countries, 1955 to 2007

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Standard error</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCs</td>
<td>0.26</td>
<td>0.02</td>
<td>0.17</td>
</tr>
<tr>
<td>HICs</td>
<td>0.28</td>
<td>0.03</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Relative rate of assistance.

equitable strategy would be instead to treat agriculture in the same way they have been treating non-farm tradable sectors. That would involve opening the sector to international competition and relying on more efficient domestic policy measures for raising government revenue (for example income and consumption or value-added taxes in lieu of trade taxes) and assisting farm families (for example public investment in rural education and health, rural infrastructure, and agricultural research and development). Investments in public agricultural R&D in developing countries as a group is currently equivalent to less than 1 percent of the gross value of farm production (about half the intensity of high-income countries). Given the extremely high rates of return at the margin to such investments (see, for example, Fan 2008), expenditure on that would be far wiser than providing farm price supports as middle-income economies develop.

As for high-income countries, the above distortion estimates show that they have all lowered the price supports for their farmers since the 1980s. In some countries that has been partly replaced by assistance that is at least somewhat decoupled from production. If that trend continues at the pace of the past quarter-century, and if there is no growth of agricultural protection in developing countries, then before the middle of this century most of the disarray in world food markets will have been removed. However, if the WTO’s Doha Development Agenda collapses, and governments thereby find it more difficult to ward off agricultural protection lobbies, it is all the more likely that developing countries will follow the same agricultural protection path this century as that which was taken by high-income countries last century. One way to encourage developing countries to follow a more liberal policy path could be to extend the Integrated Framework’s Diagnostic Trade Integration Study (DTIS) process to a broader range of low-income countries. That process, which provides action plans for policy and institutional reform and lists investment and technical assistance needs, could be expanded to include the “aid for trade reform” proposal that has been discussed in the context of the Doha round (Hoekman 2005)—regardless of the fate of that round.

Areas for Further Research

Clearly there have been dramatic changes in distortions to agricultural incentives over the past half-century. They worsened up to the 1980s in most regions, but since then there has been substantial reform in many (but not all) developing and high-income countries. Nonetheless, net farm incomes in developing countries as a group are still depressed by the policies in place in both sets of countries as of 2004, in the sense that removing all distortions to goods markets globally would raise agricultural value added in developing countries by 5.2 percent, while value added in the rest of their economies would rise only
2.1 percent on average. That average hides considerable diversity across developing countries though, so its impact on inequality and poverty at the individual country level needs to be assessed for different types of households on a case by case basis—as is being done in a forthcoming set of national and global modeling studies reported in Anderson, Cockburn, and Martin (forthcoming).

Why some countries have reformed more or later than others, why some developing countries have “overshot” in the sense of moving from taxing to subsidizing farmers relative to producers of other tradables, and why assistance rates still vary so much across countries and commodities are puzzles that can be examined more easily now that there is a comprehensive global database of distortion estimates for the full spectrum of countries at varying stages of development (Anderson and Valenzuela 2008), building on earlier insights from the Krueger, Schiff, and Valdés study and more recent reform studies (Krueger 1992, 2000; Rodrik 2003; Ndulu and others 2008) as well as advances in political economy theory (for example Grossman and Helpman 2001, 2002; Acemoglu and Robinson 2006; North, Wallis, and Weingast 2009). A beginning to such political econometric analysis is under way and one set of studies is reported in Anderson (forthcoming b), but much more research in that area remains to be undertaken.

Notes

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1. This section draws on Anderson and others (2008).

2. Other developments that change incentives facing producers and consumers can include flow-on consequences of the distortion, but these should not be confused with the direct price distortion that needs to be estimated. If, for instance, a country is large in world trade for a given commodity, imposition of an export tax may raise the price in international markets, reducing the adverse impact of the distortion on producers in the taxing country. Another flow-on consequence is the effect of a country’s trade distortions on its real exchange rate, which is the domestic price of traded goods relative to non-traded goods. Neither of these flow-on effects is of immediate concern, however, because if the direct distortions are accurately estimated, they can be incorporated as price wedges into an appropriate country or global economy-wide computable general equilibrium (CGE) model. Such models are able to capture the full general equilibrium impacts (inclusive of real exchange rate effects) of the various direct distortions to producer and consumer prices.
3. The NRA differs from the producer support estimate (PSE) as calculated by the OECD, in that the PSE is expressed as a fraction of the distorted value. It is thus $t_n/(1 + t_n)$, and so for a positive $t_n$, the PSE is smaller than the NRA and is necessarily less than 100 percent.

4. Exceptions were high specific taxes on wine imports from France and high excises on some other exotic imported food items (Nye 2007).

5. There is, however, an update for Latin America and a similar study for a few transition economies available in Valdés (1996, 2000).

6. A global overview of the results is provided in Anderson (2009), and the detailed country case studies are reported in four regional volumes covering Africa (Anderson and Masters 2009), Asia (Anderson and Martin 2009), Latin American (Anderson and Valdés 2008), and Europe’s transition economies (Anderson and Swinnen 2008).

7. These and related questions were addressed a little earlier but using the GTAP Version 6 protection database (for 2001), with which the results presented below can be compared. See Anderson, Martin, and van der Mensbrugghe (2006) for a LINKAGE model analysis and Anderson and Valenzuela (2007) for one using the GTAP model.

8. Results are also available for numerous individual countries, where the relative importance of own-country versus rest-of-world’s policies can be shown. Krueger, Schiff, and Valdés (1988), like Jensen, Robinson, and Tarp (2002), focus on effects of just own-country policies, the first using partial equilibrium and the second using national general equilibrium models. On the relationship between those two methodologies, see Bautista and others (2001). For detailed country case studies using the World Bank’s new agricultural distortions database, see Anderson, Cockburn, and Martin (2009).

9. That compares with an earlier estimate, using the GTAP 2001 database, of $156 billion per year (Anderson, Martin, and van der Mensbrugghe 2006, table A12.3).

10. For a detailed analysis of the buyout option versus the slower and less complete cashout option (moving to direct payments), as well as the uncompensated gradual squeeze-out or sudden cut-out options, see Orden and Diaz-Bonilla (2006).

11. Developing countries are becoming less and less reliant on trade taxes as a source of government revenue, with even very poor countries realizing that a tax imposed at the border, if called a consumption tax rather than a tariff, does not induce protected domestic production and yet can raise the same revenue at the same collection cost as a tariff.

References


Notes
Agricultural Employment Trends in Asia and Africa: Too Fast or Too Slow?

Derek Headey, Dirk Bezemer, and Peter B. Hazell

Contrary to conventional economic theories, the relationship between income growth and agricultural employment is extremely diverse, even among regions starting from similar levels of development, such as Asia and Africa. Due to its labor-intensive Green Revolution and strong farm–nonfarm linkages, Asia's development path is mostly characterized by fast growth with relatively slow agricultural exits. In contrast to Asia, urban biased policies, low rural population density, and high rates of population growth have led a number of African countries down a path of slow economic growth with surprisingly rapid agricultural exits. Despite this divergence both continents now face daunting employment problems. Asia appears to be increasingly vulnerable to rising inequality, slower job creation, and shrinking farm sizes, suggesting that Asian governments need to refocus on integrating smallholders and lagging regions into increasingly commercialized rural and urban economies. Africa, in contrast, has yet to achieve its own Green Revolution, which would still be a highly effective tool for job creation and poverty reduction. However, the diversity of its endowments and its tighter budget constraints mean that agricultural development strategies in Africa need to be highly context specific, financially sustainable, and more evidence-based. JEL codes: O13, O15, O18

Long-run economic growth has been accompanied by a significant exodus of workers out of the agricultural sector. This observation was regarded as a robust stylized fact by early development economists and was incorporated into a wide array of development theory (Lewis 1954; Hirschman 1958; Kuznets 1973; Chenery 1979). Subsequent research has added important nuances to this observation—for example many agricultural workers move into the local nonfarm economy rather than to urban areas (Anderson and Leiserson 1980)—but the basic conclusion that development entails “agricultural exits” has rarely been
questioned. Since 1960, however, trends in economic development and agricultural employment shares have systematically diverged: most of Asia has grown quickly but many Asian workers have stayed on the farm; and most African economies have made virtually no net real-income gains in the four decades from 1960 to 2000 (especially since 1980), though large numbers have left the farm, often for burgeoning cities.

We explore the causes of this divergence between Asia and Africa, and also attempt to answer two “so what?” questions. First, does it matter that workers are leaving agriculture more or less quickly than the norm (if there is a norm)? In other words is there anything special about agriculture that makes employment outcomes in that sector an important policy objective? Second, what sorts of development strategies would promote agricultural employment or accelerate the transition out of agriculture?

Research on and around these questions has a long history in mainstream development debates. Much of the concern in the 1950s and 1960s was with over-urbanization and the emergence of megacities in Latin America and Asia. After Sovani’s (1964) balanced critique of the over-urbanization thesis, economists remained relatively quiet on the subject, although Harris and Todaro’s (1970) work was a landmark paper in demonstrating how rational migrants could induce suboptimal outcomes at the macroeconomic level by adding to the problems of urban unemployment and congestion. The early literature on Asia’s Green Revolution also demonstrated that new technologies could generate significant employment growth both in agriculture and, via spillovers, in the rural nonfarm economy (Mellor 1976). The 1979 World Development Report (WDR) on Structural Change and Development Policy demonstrated that while “urbanization in the industrialized countries took many decades, permitting a gradual emergence of economic, social, and political institutions to deal with the problems of structural transformation, the process in developing countries is occurring far more rapidly,” especially in Latin America and sub-Saharan Africa. And although the report argued that intra-urban population growth was the primary cause of urbanization, it did conclude that urban-biased policies were accelerating rural to urban migration. Following Lipton (1977), the urban bias hypothesis continued to be explored by researchers both within and outside the World Bank (Bates 1981, World Bank 1984, 2000; Krueger, Schiff, and Valdes 1991; Fay and Opal 1999).

Three decades on from the 1979 WDR, the 2008 and 2009 WDRs (World Bank 2008, 2009a) are also reflections on these issues, and they justifiably pose new questions in light of additional facts and new knowledge. The WDR 2008 on Agriculture for Development (which an earlier version of this paper contributed to as a background paper) re-examines the roles that agriculture plays in growth and poverty reduction processes, and also distinguishes between economies at different stages of urbanization and agricultural employment shares (World Bank
2008, ch. 1). But it also poses new questions about the challenges of agricultural exits (World Bank 2008, ch. 9), especially the rural employment challenge, a theme just as relevant to Asia’s “slow exit” problems as it is to Africa’s “fast exit” problems. The 2009 WDR on Spatial Disparities and Development Policies also focuses on the rural–urban transformation, as well as related issues of territorial development and regional integration.

This article very much bridges the central themes of the 1979, 2008, and 2009 WDRs. In the next section we reinvestigate the relationship between economic growth and agricultural employment, though we also question the validity of the apparent break between Asia and Africa’s development paths. We then seek to account for what appears to be a genuine divergence in Asia and Africa’s agricultural exit paths, before examining the possibility that Asia’s surprisingly slow urbanization may be related to rising spatial inequality, shrinking farms, and increasingly jobless growth. In the next section we examine the African context, where agriculture has long been neglected and where its future is still under debate. We conclude with a discussion as to how policymakers can address these problems.

Agricultural Exits and the Growth Process: Economic Theories and “Stylized Facts”

Structural change is a broad term which covers the shift of output, employment, and livelihoods away from the rural agricultural sector toward a predominantly urban nonagricultural sector. We will primarily focus on the shift from agricultural to nonagricultural livelihoods using measures of nonagricultural employment shares, rural nonfarm employment, and urbanization.

What does economic theory lead us to expect? Although schools of thought differ as to their explanations of why structural change should accompany economic growth, all schools emphasize that structural change is intimately connected with the growth process. For example industrialization strategies emphasize a modern industrial sector as the engine of growth. In this view agriculture is largely a backward, unproductive sector in which labor operates at low levels of productivity—it may even be characterized by zero marginal productivity or surplus labor (Lewis 1954)—and agriculture has weak upstream and downstream linkages with other sectors (Hirschman 1958). In contrast modern industry is a sector with considerable technological potential, increasing returns and agglomeration externalities, high degrees of labor intensity (at low levels of industrialization), and strong linkages to other sectors. The differential economic potential between the sectors is such that a transfer of labor and capital from agriculture to nonagriculture constitutes a significant source of both structural change and economic growth. 1

Hoddinott, Bezemer, and Hazell
A second school of thought argues that agriculture can be an engine of growth, certainly at the early stages of development. As agriculture is often more labor intensive than nonagricultural industries (Schultz 1964), gains in agricultural productivity can contribute to higher employment and incomes, better nutrition and faster poverty reduction, and prevent distress migration from rural areas into urban unemployment. The Green Revolution demonstrated agriculture's considerable technological potential, as well as the benefits of its extensive upstream and downstream linkages to broader economic growth (Bezemer and Headey 2008). Indeed the potential of a dynamic agricultural sector to keep food prices low (and thereby curb wage inflation), to provide foreign exchange earnings via exports, and to increase rural demand for nonfarm production and consumption goods are all factors which suggest that agriculture can make substantial contributions to the industrialization process (Johnston and Kilby 1975). So this agriculture-first view also predicts that structural change and growth go hand in hand, but it distinguishes itself from the industry-first school by asserting that agricultural growth significantly drives nonagricultural growth, especially at the early stages of development (Hazell and Diao 2005; Diao and others 2007; Bezemer and Headey 2008).

From Theory to Experience: The Stylized “Facts” of Structural Change and Growth

Despite different assumptions and very different policy prescriptions, both views posit a strong positive association between measures of structural change and economic growth. With respect to the share of nonagricultural output in total output, this hypothesis is still well supported by the stylized facts: nonagricultural output shares rise in a fairly systematic fashion as GDP per capita rises, both in the long run and the short run (see World Bank 2008, figure 1.2). But what about nonagricultural employment in total employment or, as a cross-check, the shares of the urban population in the total population? Are these measures just as strongly correlated with GDP per capita?

Superficially the answer is yes. Figure 1 demonstrates the conventional “long-run” association between GDP per capita, the nonagricultural labor force share, and the urban population share. Several facts are of note. First, the relationships are somewhat nonlinear, suggesting that structural change measures increase more rapidly than income in early stages of development (see also World Bank 2008, figure 1.2). Second, the nonagricultural labor force shares increase to higher levels than urbanization shares, suggesting that the rural nonfarm economy becomes increasingly important as development proceeds. Third, the relationship between sectoral employment shares and income is stronger than that of urbanization shares with income. Fourth, a number of Asian countries tend to be well under the “on average” log-linear regression lines, perhaps
suggestions some degree of under-urbanization; likewise, a number of non-Asian countries are well above the regression lines, perhaps suggesting over-urbanization. But despite these outliers, both relationships are reasonably strong: correlation coefficients with income per capita are in excess of 0.70 for both of these population measures.

On the basis of this strong “long-run” relationship one might be tempted to conclude that the stylized relationship between growth and agricultural employment remains robust. But this static snapshot largely obscures the diversity of agricultural exit paths since the end of the colonial era. In figure 2 we map out income and agricultural exit paths for various developing Asian and African countries over the period 1960 to 2000. Squared tips on these paths signify endpoints for the year 2000; the opposite ends signify the starting points in 1960. The figure reveals that the trajectories for Asian and African countries are very different from each other. Asia—especially East Asia—has grown very quickly from a generally low base, though nevertheless experiencing surprisingly slow agricultural exits. In most Asian countries an income increase of $1,000 per capita only resulted in a 10-point increase in the urban population share. China's low rate of urbanization is especially well documented, but Indonesia has followed...
a remarkably similar path, and India is on a similar trajectory despite less substantial income gains. Other Asian countries—Sri Lanka, Malaysia, Bangladesh, Thailand, Vietnam, Nepal, Pakistan—have followed a parallel route but with even lower nonagricultural employment levels. The one exception in this Asian sample is the Philippines. From 1960 to 1980 that country followed the usual East Asian path of fast growth (a gain of roughly $1,250 per capita) and modest agricultural exits (just a 7-point increase). But a sharp growth deceleration from 1980 to 2000 left income unchanged, even though Filipinos continued to leave the farm.

Despite starting from a similar base, Africa has followed an opposite path to Asia's, although its story is more nuanced. Africa’s largest country, Nigeria, has experienced 40 years of large numbers of people leaving agriculture, despite no significant GDP growth (in fact Nigeria’s real GDP per capita actually declined by $300 during 1960–2000, while the reported share of nonagricultural employment in the total population increased by almost 40 percentage points). As for the rest of Africa, this basic trajectory still holds, but not quite so dramatically, and its dynamics are more similar to those of the Philippines than to Nigeria. Other sub-Saharan African countries experienced modest rates of growth and agricultural exits from 1960 to 1980, before experiencing 20 years of stagnant income growth which coincided with a continued shift out of agriculture.
Moving beyond averages, agricultural exit rates within Africa really fall into three tiers over the 1980–2000 period. One group that experienced rapid changes in nonagricultural employment shares of 20 percentage points or more consists mostly of oil producers like Cameroon, Sudan, Angola, and Nigeria. A second group experienced shifts of 10–15 percentage points (for example Sierra Leone, Ghana, Rwanda)—which is still high compared to Asia’s trajectory. A third group witnessed changes of less than 10 percentage points (including Ethiopia, Africa’s second largest country).

These dynamic portraits of alternative agricultural exit paths therefore tell a very different story to that of the long-run snapshot in figure 1, but we need to be careful about reading too much into them. On the basis of figure 2, for example, one might conclude that since Asia has experienced the most rapid economic growth, its process of slower agricultural exits represents a “best practice” benchmark. However, employment decisions could merely be a by-product of other growth determinants, such as agricultural and industrial policies, yet not have any causal influence on growth by themselves. Even more confounding for our analysis is the possibility that these stylized facts are actually biased by some serious data issues.

**Stylized Facts or Stylized Falsehoods?**

Are the remarkably divergent trajectories of Asia and Africa real, or are they somehow induced by biases originating from either economic growth data or employment data? In truth, both sets of measures are far from perfect. Biases in something as commonly used as GDP data are often overlooked, but it is possible that China’s growth is somewhat overestimated (see for example Maddison 1998; Rawski 2001; Wang and Meng 2001; Holz 2004) and that Africa’s is somewhat underestimated because of a larger informal economy (Schneider 2005; Henderson, Storeygard, and Weil 2009). In other countries, such as the Philippines, the omission of overseas workers’ remittances will also lead to underestimation of real income growth. Yet biases in GDP data pale in comparison to those found in employment and urbanization data, which are flawed due to conceptual problems as well as infrequent and imprecise measurement. The UN urbanization estimates are widely contested, for example, and it is well known that definitions of ‘rural’ and ‘urban’ vary substantially across countries and, for some important countries such as China, across time (Headey, Bezemer, and Hazell 2008). Issues with employment data are much less discussed and more pertinent to this paper, so we will look at these more closely.

In table 1 we compare male nonagricultural employment shares from the standard FAO/International Labour Organization (ILO) data to estimates derived from the Demographic Health Surveys (DHS). In principle, both purport to measure the
Table 1. Alternative Estimates of Male Nonagricultural Employment Shares (%), circa 2000–2005

<table>
<thead>
<tr>
<th>Region/country</th>
<th>No. obs.</th>
<th>FAO</th>
<th>DHS</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central America</td>
<td>6</td>
<td>51.6</td>
<td>51.5</td>
<td>–0.2</td>
</tr>
<tr>
<td>East Africa</td>
<td>8</td>
<td>23.3</td>
<td>31.4</td>
<td>8.0</td>
</tr>
<tr>
<td>Central Asia a</td>
<td>6</td>
<td>76.8</td>
<td>54.6</td>
<td>–22.2</td>
</tr>
<tr>
<td>South America</td>
<td>4</td>
<td>61.9</td>
<td>64.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Other South Asia</td>
<td>4</td>
<td>30.7</td>
<td>46.8</td>
<td>16.0</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>23</td>
<td>39.3</td>
<td>34.7</td>
<td>–4.7</td>
</tr>
<tr>
<td>West Africa Sahel</td>
<td>12</td>
<td>22.2</td>
<td>32.9</td>
<td>10.7</td>
</tr>
<tr>
<td>West Africa Coastal</td>
<td>19</td>
<td>42.0</td>
<td>39.8</td>
<td>–2.3</td>
</tr>
<tr>
<td>Nigeria</td>
<td>1</td>
<td>70.3</td>
<td>66.4</td>
<td>–3.9</td>
</tr>
<tr>
<td>Philippines</td>
<td>1</td>
<td>53.8</td>
<td>56.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2</td>
<td>55.9</td>
<td>61.2</td>
<td>5.3</td>
</tr>
<tr>
<td>China b</td>
<td>1</td>
<td>35.7</td>
<td>53.1</td>
<td>17.4</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>55.9</td>
<td>52.1</td>
<td>–3.8</td>
</tr>
</tbody>
</table>

a For simplicity, Central Asia includes the Ukraine and Turkey, which are not normally regarded as Central Asian countries.

b Chinese data relates to both male and female employment for both FAO and the national source.

Notes: For Nigeria the DHS estimates were sensitive to treatment of unemployment data. Excluding all unemployment lowered Nigeria's nonagricultural employment share, but we opted to distribute the rural unemployed to the agricultural and nonagricultural sectors based on the (non)agricultural employment shares of the employed rural male population.

Sources: FAO (2009) and DHS (2009). Indian and Chinese data are drawn from their respective national statistical agencies.

same thing: the primary occupation of adults, both male and female. ILO data are based on official labor force surveys and population censuses, but the ILO faces a number of challenges in deriving internationally comparable data. First, the paucity of survey/census data is serious indeed, so much so that reported ILO labor force participation data are actually extrapolations from an econometric model, with only about 20–30 percent of the full panel data pertaining to actual survey/census data (ILO 1996, 2008). For African countries, however, this ratio is only 6.5 percent. Second, labor force surveys are known to be both urban biased and gender biased, with women’s participation in agriculture often under-reported for cultural reasons (on urban biases in labor force surveys, see Timmer and de Vries 2007; on gender biases see ILO 2008). In comparison, while the DHS do not have the objective of measuring occupational data or other economic variables, the fact that the surveys cover nearly all African countries in a nationally representative fashion suggests that they make a useful benchmark. Moreover all the DHS data are drawn from surveys carried out in the late 1990 s or 2000 s, and are thus very recent. Note, however, that DHS are not carried out for China.
so we use Chinese Bureau of Statistics data for the comparison of Chinese statistics. We also do the same for India because national sources are probably more reliable there than those of the DHS.

Table 1 suggests that there are some large differences between the two sources, especially in particular regions. FAO/IlO nonagricultural employment shares look relatively low for East Africa, other South Asia, and the West African Sahel, but much too high in Central Asia. Also of interest are some of the larger countries in East Asia as well as Nigeria. We find that the FAO/IlO may slightly overstate nonagricultural employment in Nigeria, although the DHS estimate still suggests that two-thirds of Nigerian men have already left agriculture as a primary occupation. In the Philippines and Indonesia the differences are not large, but DHS puts nonfarm employment at over 60 percent in Indonesia. More disconcertingly the data suggest that the ILO may be substantially underestimating nonagricultural employment in China, for which we report both male and female employment together. FAO/ILO estimates put this figure at just 36 percent, while national data sources put it at 53 percent. Of course this is still considerably lower than Nigeria, even though average Chinese incomes are five times higher than Nigerian incomes. As with China our Indian benchmark comes from a national source, although in this case the estimate matches the FAO estimate quite closely.

Another important issue is the extent to which individuals adopt diversification strategies, working in both agriculture and nonagriculture on either a part time or seasonal basis. The primary employment data in table 1 obviously completely bypass this important issue. Of particular interest is the hypothesis that while rural Asians may not have moved to cities in huge numbers, they have had the opportunity to diversify into the rural nonfarm economy. Data issues again pose a challenge to assessing this bias given differing definitions of 'rural' and other comparability issues. What data there is also show a nuanced message on differences between Asia and Africa. On the one hand, DHS data for the late 1990s and 2000s indicate that Africa's rural nonfarm employment shares average around 27.5 percent once some small countries are excluded (Lesotho, Swaziland), while Asia's is around 36.8 percent (and just 33 percent if the Philippines is again excluded as an outlier). However, income data show a larger gap. Winters and others (2008), for example, use 15 household surveys to show that rural nonagricultural income shares range from 34–81 percent in five Asian countries, but are under 50 percent in four African countries; and earlier evidence in Haggblade, Hazell, and Reardon (2007b) show that manufacturing is a much more important rural nonfarm activity in Asia than it is in Africa. Hence the usual conclusion is that Asia has a much more vibrant rural nonfarm economy, a topic we take up in subsequent sections.

In summary, we find that although various biases in employment and demographic data might explain some of the divergence in employment trends between

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Asia and Africa, they don’t eradicate the difference altogether. For the most part, Asia really has grown quickly, but it has experienced a surprisingly slow exodus from agriculture, though balanced to some degree by a higher diversification into the rural nonfarm economy. Africa, in contrast, has witnessed a large exodus from agriculture, often to burgeoning cities (some 10,000 people are estimated to migrate to Lagos every day), despite virtually no real income gains. So whilst the rapidly divergent trajectories between Asia and Africa might be partially closed by better data, the large residual divergence still presents us with a set of stylized facts worthy of further investigation.

Explaining the Divergence between Africa and Asia

Why have so many Africa countries experienced a significant structural shift in employment in the absence of significant economic growth? And why have most of Asia’s fast-growing economies not experienced larger structural shifts? Whilst employment shifts and migration have complex country-specific determinants (Karp 2007; de Brauw and Carletto 2008), we focus on the principal factors that would seem to explain this broad divergence across Africa and Asia.

Specifically, we argue that the slower than expected employment exit in Asia can be attributed to at least six factors. First, Asia’s Green Revolution catalyzed rapid growth in farm incomes and labor productivity, making it more attractive for workers to stay in agriculture. Second, the Green Revolution technologies were, initially at least, highly labor intensive, creating many additional productive jobs. Third, the rural nonfarm economy (RNFE) grew more rapidly in Asia—driven initially by increases in agricultural income, dense population, and settlement patterns—enabling many farm households to diversify their incomes whilst still relying on agricultural activities for their principal livelihood. Fourth, dense settlement patterns also meant that rural people had relatively good access to public services in rural areas and didn’t need to migrate to cities to improve the basic quality of life. Fifth, many farmers cannot easily exit farming and it is instead their children who leave the farm. Farm exits simply take time—over several generations in today’s industrial countries—and Asia’s unprecedented rates of growth in per capita GDP could well be building up a backlog of potential exits for the future. Sixth, in some countries there have been barriers to rural—urban migration (for example China) that have made agricultural employment exits more difficult.

An important point is that many of these drivers reflect Asia’s aggressive investment in agricultural and rural development over the past five decades, as well as accelerating rates of national economic growth. Asian governments have consistently expended 10–15 percent of their total budget on agriculture. During the
Green Revolution era most of this went into agricultural R&D, irrigation, and rural roads. Asian governments also provided direct policy support to agriculture by shoring up farm credit systems, subsidizing key inputs—especially fertilizers, power, and water—and intervening in markets to ensure that farmers receive adequate and stable prices each year, and that small farmers were not left behind. (Djurfeldt and others 2005). Many Asian governments directly promoted rural nonfarm activities (Mukherjee and Zhang 2007; Otsuka 2007), while rural–urban inequality in the supply of public health, education, and social services has also been relatively low in Asia.

Africa, in contrast, has pursued a very different pathway that has encouraged rapid rural–urban migration. African governments essentially failed to induce a Green Revolution. The adoption of modern techniques has been much lower there compared to all other developing regions (see World Bank 2008, figures 2.1 and 2.2), and per capita agricultural output stagnated and even declined over much of Africa since 1960. Stagnating farm incomes, weak growth in productive farm jobs, and rapid population growth have all contributed to encouraging workers to seek alternative livelihoods in the cities. Poor infrastructure, more dispersed settlement patterns, and slow growth in agricultural incomes have also contributed to a low return RNFE sector that encourages rural–urban migration over rural income diversification (Reardon 1997).

The reasons for the underlying failure of agricultural and rural development in Africa are complex, but they can broadly be grouped into exogenous factors (that is endowments) and endogenous policy-related factors (Johnson, Hazell, and Gulati 2003). In terms of the former, Africa is exogenously constrained by its geography. It possesses much more diverse agricultural conditions and outputs than Asia. FAO data suggest that in 1980 about a quarter of total crop land in Asia was devoted to rice, wheat, and maize—the first crops to benefit from high yielding varieties—whereas just 11 percent of Africa’s cropped area was devoted to these crops, and most of this was maize. Sustained R&D has produced high-yielding African crop varieties, such as the International Institute for Tropical Agriculture (IITA)’s improved cassava varieties, but producing and disseminating these varieties has taken longer, and R&D and extension activities have long been underfunded in Africa.

Rural population density in Africa is also much lower than it is in Asia. Using geospatial mapping, figure 3 reports estimates of the population density experienced by the average rural African. The figure indicates that most rural Africans live in areas that are much less densely populated than rural Asia. Low population density implies land abundance and isolation from large urban markets, which constrain the demand for technologies that would more intensively utilize existing land as techniques like fallow farming (rotating fields) are an alternative to fertilizers for the maintenance of soil fertility (Binswanger and McIntire 1987).
Moreover isolation from large urban markets keeps land prices low and encourages the persistence of low value crops, raises the costs of inputs, and reduces the prices farmers receive for outputs. Finally, low population density constrains the growth of the rural nonfarm economy (Haggblade, Hazell, and Reardon 2007b) and makes the provision of economic infrastructure and social services more costly (Hewett and Montgomery 2001).

With regard to policies, African governments generally discriminated against both agriculture and rural populations through biases in macroeconomic policies and public investments (Lipton 1977; Bates 1981; Krueger, Schiff, and Valdes 1991; Hazell and Diao 2005). As Bezemer and Headey (2008) discuss, urban biased development policies partly arose because of historical and ideological forces dating back to colonial policies, the import-substitution-industrialization strategies of the 1950s and 1960s, and the neglect of agriculture among foreign aid donors. But such biases are also institutionalized by the political disenfranchisement of the rural poor (and in some cases disenfranchisement of particular rural ethnic groups), who lack the economic and political conditions for effective political action (Binswanger and Deininger 1997).

How important are these policy factors today? With the structural adjustments of the 1980s and 1990s, macroeconomic distortions against African agriculture have indeed declined—but so have public investment and foreign aid to the sector.
Welfare measures also still indicate very high differences between rural and urban populations. The World Bank’s *Rural Poverty Report* (2003), for example, finds that access to safe water, improved sanitation, and education and health services is generally 20 to 30 percentage points higher in urban than in rural areas. Hewett and Montgomery (2001) find that 88 percent of Africa’s urban households receive electricity, as compared to just 5 percent of rural households. Consistent with this welfare gap, Africa’s rural poor seem to be increasingly migrating to urban areas (Ravallion, Chen, and Sangraula 2007).

**Asia’s Slower Exit out of Agriculture: A Successful Strategy Now Running out of Steam?**

In the previous section we told an Asian story that bore all the hallmarks of an economically successful development path in which agriculture served as the principal engine of national poverty reduction. Much of Asia thereby mitigated many of the problems associated with rapid agricultural exits and urbanization, especially rising urban unemployment and its related problems. But despite their previous success, Asian economies arguably face a number of challenges. Although parts of East Asia will experience an aging of their populations over the next few decades (see below), much of South and Southeast Asia will still experience a sharp rise in the number of working age adults. It is already clear that Asian agriculture has limited prospects for absorbing the majority of these new workers. Declining yield growth, shrinking farm sizes, decreasing labor intensity, demographic change, and “brain drain” are all major challenges for Asian agriculture, as is the persistence of poverty among particular social groups and geographically disadvantaged regions that were largely bypassed by the Green Revolution. Urbanization projections (for what they are worth) suggest that there will be about 8 million new urbanites per year in China, 11 million per year in India, and 16 million per year in the rest of Asia (Bocquier 2004). In this section we assess the hypothesis that Asia does indeed have a growing backlog of agricultural workers who require more employment opportunities outside of agriculture. Specifically, we look at three significant pieces of evidence consistent with this conjecture.

*Diminishing Returns in Asian Agriculture*

Asia’s Green Revolution began over four decades ago, and in almost all instances resulted in rapid growth in yields over a number of years. Maintaining high growth rates has proved increasingly difficult, however, such that yield growth in key staples has declined from 2–3 percent per annum in the 1970s to around
1 percent per annum in the last decade or so (World Bank 2008, pp. 66–7). This is partly the result of inevitable technological barriers, but is also due to unsustainable policies that encouraged the wasteful use of fertilizers, electricity, and irrigation. Water, especially, is becoming an increasingly large constraint on yields, with the ground water overdraft rate estimated to exceed 25 percent in China and 56 percent in India’s north-west breadbasket, while absolute water scarcity is thought to affect over 850 million people in developing Asia (IWMI 2007).

An additional constraint is farm size. Principally because of rural population growth, average farm sizes in Asia are shrinking markedly (table 2). In India they fell from an average of 2.3 hectares in 1971 to 1.4 hectares in 1995/96; in Pakistan from 5.3 to 3.1 hectares; and in Bangladesh from 1.3 to just 0.6

<table>
<thead>
<tr>
<th>Country</th>
<th>Census year</th>
<th>Average farm size (ha)</th>
<th>Number of small farms* (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1971</td>
<td>2.3</td>
<td>49.11</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>1.6</td>
<td>84.48</td>
</tr>
<tr>
<td></td>
<td>1995/96</td>
<td>1.4</td>
<td>92.82</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1977</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1996</td>
<td>0.6</td>
<td>17.03</td>
</tr>
<tr>
<td>Nepal</td>
<td>1992</td>
<td>1.0</td>
<td>2.41</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>0.8</td>
<td>3.08</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1971/73</td>
<td>5.3</td>
<td>1.06</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>3.8</td>
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<tr>
<td></td>
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<td>1993</td>
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<td>Vietnam</td>
<td>2001</td>
<td>—</td>
<td>10.13</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>1999</td>
<td>—</td>
<td>0.49</td>
</tr>
<tr>
<td>Myanmar</td>
<td>1993</td>
<td>—</td>
<td>1.66</td>
</tr>
<tr>
<td>Thailand*</td>
<td>1978</td>
<td>3.6</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>2.9</td>
<td>1.86</td>
</tr>
<tr>
<td>China</td>
<td>1980</td>
<td>0.6</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>0.4</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>—</td>
<td>189.38</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>0.4</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>c. 2000</td>
<td></td>
<td>340.53</td>
</tr>
</tbody>
</table>

* The definition of a small farm is 2 hectares for all countries except Thailand, where Anriquez and Bonomi (2007) define small farms as less than 1.6 hectares.
— Not available.

Source: The majority of the data are from Nagayets (2005), although much of the data on the number of small farms are from Anriquez and Bonomi (2007).
hectares. We estimate that in 2000 there were roughly 340 million farms in developing Asia smaller than 2 hectares.

Whether these smallholders are microeconomically inefficient has been a subject of perpetual debate since Berry and Cline (1979), if not earlier. Reviews of the issue by Fan and Chan-Kang (2005) and Anriquez and Bonomi (2007) suggest that small farm productivity varies over regions, over levels of development, and over how one defines ‘efficiency’ (for example as ‘land productivity,’ ‘labor productivity,’ or ‘total factor productivity’). What is not in dispute, however, is that the successful adoption of modern technologies by Asian smallholders has resulted in significant poverty reduction, an outcome which is difficult to envisage being achieved through allocating resources to large farms. But can this process be sustained? Two more contemporary concerns must now enter this debate. The first is whether the economic viability of smallholders is declining because of the growth of agribusiness and globalization processes (Joshi, Gulati, and Cummings 2007). The second is whether Asian farm sizes are now declining to the point where they will be inefficient, even if they were not so in the past. Many small farmers are now part-time, for example, and may not be as driven by efficiency concerns as before. Shrinking farm sizes may also explain why the rural nonfarm (RNF) sector appears to have been considerably more vibrant than the farm sector in many parts of rural India (Foster and Rosenzweig 2004).

**Persistent Rural Poverty and Rising Rural-urban Inequality**

Despite a history of high agricultural growth rates and rural income diversification, Asia is still characterized by large numbers of people who have not significantly benefited from rapid economic growth (Fan and Hazell 2001). The poorest of the poor are often concentrated in geographically adverse regions (for example isolated mountainous regions in Eastern India, Western China, Northern Thailand, and Vietnam), in tribal regions or among low caste groups, and in areas with particularly poor governance or political instability (for example India’s Bihar state). Absolute poverty numbers are also a significant problem in Asia, especially in rural areas. Whilst China made great strides in reducing rural poverty in the 1980s, absolute numbers of poor people have remained stubbornly high in many other parts of Asia (World Bank 2008, p. 3) and may even have increased in absolute numbers in India during the 1990s (Deaton and Kozel 2005).

Part of the rising inequality may be connected to the feminization and aging of rural labor forces (Buvinic, Gwin, and Bates 1996; Mehra and Gammage 1999), which may impede labor force mobility. But this is still uncertain, as solid evidence for agricultural labor force feminization is scarce to date. De Brauw’s (2002) empirical study for China actually finds the opposite: the
The proportion of farm work being done by women was *declining* over the late 1990s, and future feminization of agriculture in China is judged unlikely. Anriquez and Bonomi (2007) collate data from various agricultural censuses and find that feminization of the rural labor force is only a concern in Africa, and that rural aging issues are not of pervasive concern in any country in their sample. However, that sample did not include China, where increasing numbers of older rural people are being left behind by economic growth (Benjamin, Brandt, and Giles forthcoming).

Somewhat surprisingly, however, rural–urban inequality shows no signs of having systematically increased in Asia (Eastwood and Lipton 2004), although spatial inequality has risen markedly in China, India, and Indonesia (Milanovic 2005), again reinforcing the importance of lagging regions. China is a significant case in that both spatial inequality and rural–urban inequality have been rising rapidly. In China, rural–urban inequality was relatively high in the pre-1978 period (especially given that overall inequality was very low), but it decreased markedly during the period of major agricultural reforms in the early 1980s (due to the household responsibility system and the dual track price mechanism). However, from 1985 to 1999 China’s income distribution changed along a number of different dimensions: rural–urban inequality increased back to its 1978 level, spatial inequality rose markedly (Kanbur and Zhang 2005; Milanovic 2005), and overall income inequality has risen from an admittedly very low Gini coefficient of 0.22 in 1978 to a relatively high 0.45 in 2003 (Chotikapanich and others 2007). With the exception of Vietnam, China’s structural features are quite unique, so it is not clear that other Asian countries are as vulnerable to rising inequality as China has been. Nevertheless China’s experience demonstrates some of the costs of restrictive migration policies and spatially biased reform strategies (Kanbur and Zhang 1999), which have brought rapid growth at the cost of rising inequality.

**The Threat of Jobless Growth**

The aforementioned factors suggest that Asia’s agricultural sector will still need to shed many more workers in years to come. A preliminary sign of that problem is that output-employment elasticities (OEEs) in Asian agriculture have declined over much of the 1990s (Bhalla and Hazell 2003; Bhattacharya and Sakhthivel 2004; Khan 2007). Ultimately the greatest challenge for Asia’s vast population will be creating enough nonagricultural jobs, and at a fast enough rate. Recent evidence suggests that the labor intensity of manufacturing growth is declining over most of Asia, including Asia’s largest countries, China and India. Khan’s (2007) comprehensive review of a series of United Nations Development Programme (UNDP) country studies on employment and output growth are
<table>
<thead>
<tr>
<th>Country</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td>Agriculture started shedding labor from the early 1990s, but this was reversed for a period starting in 1997. Industries and services experienced sharply falling OEEs. Overall employment performance has been poor. The problem appears essentially to be one of poor management of transition.</td>
</tr>
<tr>
<td><strong>Indonesia</strong></td>
<td>Employment performance was good prior to the crisis. OEE in manufacturing fell sharply in the recovery period. There was a reversal of the long-term reduction in agriculture’s share of employment. On balance employment performance has been poor in the recovery period.</td>
</tr>
<tr>
<td><strong>Malaysia</strong></td>
<td>OEEs have shown no trend reduction. Growth has been employment friendly overall.</td>
</tr>
<tr>
<td><strong>Philippines</strong></td>
<td>Estimates of employment intensity in the case study are inadequate to arrive at a firm judgment although it appears, from findings of other studies, that there were institutional obstacles to labor absorption in agriculture and manufacturing.</td>
</tr>
<tr>
<td><strong>Thailand</strong></td>
<td>OEEs were higher for the nonagricultural sectors in the 1990s (until 1996) than in the 1980s but the overall OEE was lower due to the fact that agriculture’s OEE turned from a positive value in the 1980s to a highly negative value in the 1990s. In the recovery period the OEE for manufacturing fell somewhat but the same for construction and services rose. The Lewis transition in agriculture of the 1990s was reversed.</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td>In the post-reform period the OEEs fell and employment growth fell as compared to pre-reform period. But real wages rose presumably due to a supply-induced tightening of the labor market.</td>
</tr>
<tr>
<td><strong>Sri Lanka</strong></td>
<td>With the exception of a few subsectors of industries and services OEEs were reasonably high and growth was employment intensive.</td>
</tr>
</tbody>
</table>

*Source: Adapted from Khan (2007).*

Presented in Table 3. These studies confirm a tendency toward declining employment intensity in agriculture, but they also suggest declining employment intensities in manufacturing. In India, capital-biased industrial policies and prohibitive labor regulations have led to an economic structure ill-suited to India’s labor abundance (Besley and Burgess 2004; Kochhar and others 2006). China’s story is more complex as it partly relates to the varying fortunes of China’s Town and Village Enterprises (which were a source of significant labor absorption in the 1980s before credit constraint slowed their growth), and partly to the gradual shedding of surplus labor from state-owned enterprises (Khan 2007). Prior to the recent financial crisis, rural–urban migration in China looked set to add further pressure on nonagricultural labor markets, but this trend will mostly likely resume once the short-term effects of the crisis abate. Between 1999 and 2003, for example, the number of internal migrants in China roughly doubled, from 52 to 98 million, and China’s 2000 census indicated annual migration rates of 8.5 percent of the workforce, with roughly 30 percent heading to local townships, 30 percent to other counties in the same province, and 40 percent representing movement across provinces (Du, Park, and Wang 2005).
To summarize, we know that most of developing Asia has achieved remarkable feats of growth and poverty reduction with relatively little urbanization, largely through a combination of rapid agricultural growth and spatially dispersed industrial growth. However, the potential of Asian agriculture to keep people on the land has diminished markedly in recent decades, and there are justified concerns that the sheer number of jobs that need to be created outside of Asia’s agricultural sector will impose a daunting challenge on the region. Such challenges would be large for any economy, but they are now magnified because the same problem is emerging simultaneously for a number of very populous Asian countries. Previous research has attempted to assess what the implications are of cheap and abundant Asian labor on labor markets in other regions of the world, such as Latin America (Wood 1997). But one might also ask whether large Asian countries will also experience lower employment growth as a result of increased competition from each other (that is in export markets).6

Agricultural Employment and Agricultural Potential in Sub-Saharan Africa

The exodus of so many African people from agricultural activities, in spite of minimal or even negative economic growth, potentially poses a serious challenge to the conventional thinking that structural transformation is part and parcel of economic development. The 2008 World Development Report, for example, distinguishes between agriculture-based, transforming, and urbanized economies, but the extreme case of Nigeria seems to be one of transformation without development. Moreover, African agriculture’s poor performance has induced pessimism in some quarters with regard to the sector’s capacity to achieve rapid growth and poverty reduction. Hence in this section we revisit the ongoing debate as to whether African agriculture really has the potential to achieve the kind of job creation, poverty reduction, and structural transformation that the Green Revolution achieved for Asian economies.

The Case for Agriculture-based Development Strategies in Sub-Saharan Africa

One of the reasons agricultural growth is thought to be so important at initial stages of development—especially for poverty reduction—is simply one of arithmetic. Consider a stylized economy in an early stage of development: the majority of the population is rural and mostly engaged in the production of a few staple crops; most rural people are poor and typically more so than urban people (Sahn and Stifel 2003; World Bank 2003); and food consumption is a large share of a
typical household's budget (50 percent or more). In this kind of economy the potential for a given growth rate in food production to raise the incomes and nutrition levels of most of the population, including the poorest, is tremendous (Diao, Headey, and Johnson 2008). The single most important commodity group for poverty reduction and nutritional improvements— (staple foods) —becomes cheaper for both the rural and urban populations, and the two most important assets that the poor own—their labor and their land—are suddenly in much greater demand (Lipton 2009).

There are some qualifications to this stylized model, of course. First, the more food prices fall, the weaker is the incentive farmers have to increase agricultural production (Diao, Headey, and Johnson, 2008). Second, if the addition to farmers' incomes is also spent on food, demand for nonfarm labor may be limited (Dercon and Zeitlin 2009). Third, if unskilled wages do go up (or if food prices don’t fall), other sectors may become less competitive, which could inhibit rather than promote structural transformation (Lewis 1954). Because of these tradeoffs there is potentially a role for strategic trade and pricing policies aimed at redistributing the effects of agricultural production growth across consumers, producers, unskilled workers, and the domestic and world economy. However, the basic reasoning of this simple model is sound, and there is also ample historical, econometric, and household modeling evidence to confirm these basic intuitions (Ravallion and Datt 1996; Djurfeldt and others 2005; Chen and Ravallion 2007; Ravallion, Chen, and Sangraula 2007; Christiaensen, Demery, and Kühl 2006; Ivanic and Martin 2008; World Bank 2008).

Perhaps the most important aspect of this model, especially in the current context, is the extent to which a given agricultural growth rate raises the demand for labor. This channel is especially important because Africa is undergoing the early stages of the so called demographic transition in which the working age population becomes large relative to the dependent population (the very young and very old). Figure 4 shows that since 1985 Africa's age dependency ratio has started declining, and that it is expected to decline at a faster rate until at least 2050. The “demographic window” presented by this decline in age dependency ratios presents Africa with both an opportunity and a threat. The opportunity arises because the increasingly larger share of productively employed adults in a population raises incomes per capita, which in turn creates opportunities for increased investments in human and physical capital for the next generation. As figure 4 shows, age dependency ratios started declining in Asia in the early 1970's, and previous research has shown that the region's unusually fast demographic transition accounted for one-third to one-half of East Asia's dynamic growth rates during the period 1965–1990 (Bloom and Williamson 1998). However, that research also suggested that the benefits of the transition are not inevitable. If African economies cannot create sufficiently productive
employment—as East Asia did—these countries will end up bypassing this unique growth opportunity. Worse still, a large population of underemployed young men greatly raises the threat of conflict; one study estimates that the risk of civil war is increased from 4.7 to 31 percent if the share of young men in the population doubles (Collier, Hoeffler, and Rohner 2007).

This reasoning suggests that the goal of creating productive employment should be much higher on Africa’s development agenda. Existing evidence also suggests that smallholder-based agricultural growth could be an engine of job creation in predominantly rural economies, and that it should generally be preferred to largeholder-based growth because of small farmers’ greater use of both family labor and hired labor (Hazell and Diao 2005; Lipton 2009). As for nonagricultural sectors, data on labor intensity are far too scarce and labor intensities vary so much that we are reluctant to generalize. However, we do know that many leading nonagricultural sectors in Africa, such as mining, are much less labor intensive than agriculture. This means that in a typical agriculture-based economy a purely nonagricultural growth strategy is overburdened from an employment perspective. Turning back to the stylized agriculture-based economy we considered above, let us assume that the agricultural population share is around 70 percent, the growth in the labor force is around 3 percent per annum (an average for developing countries in the 1990s), and that agricultural growth is at least somewhat more labor intensive than nonagricultural growth.
(for example a growth elasticity of 0.5 versus one of 0.3 for nonagriculture). If an industry-first strategy implies that agricultural production only keeps up with population growth, then a simple back-of-the-envelope calculation suggests that nonagriculture would have to grow by over 20 percent per year to absorb surplus labor (Headey, Bezemer, and Hazell 2008). It is also significant that while East Asian countries like China and Vietnam have achieved remarkable rates of industrial growth in the last few decades (typically in excess of 10 percent per annum), they still would have incurred significant unemployment problems had agriculture also not grown by 4–6 percent per annum. So from a job creation perspective, smallholder agriculture-based growth looks the best bet.

**Limitations of the Agriculture-first Model in Sub-Saharan Africa**

However, most critics of agriculture-first models do not contest the labor-intensive nature of smallholder-based growth. Instead they argue, for various reasons, that agriculture-based growth prospects in Africa are simply very limited. One potentially very important criticism is that Asian experiences cannot simply be transplanted to Africa. And indeed, as we noted above, Africa’s agronomic endowments are very different to those of Asia, especially in terms of the diversity of crops produced, the extent of irrigation, the diversity and quality of soil and climate types, and the generally lower population density. This implies that more locally adapted high-yielding varieties (HYVs) must be produced, while greater land availability in some parts of Africa suggests that the demand for HYVs and other land-intensive technologies may be more limited than was the case in population-dense Asia (Binswanger and McIntyre 1987). Yet despite these limitations Africa does have a number of both experimental and localized R&D success stories (Haggblade and Gabre-Mahdin 2004), such that the real question is arguably why these success stories are so rarely scaled up. Agroclimatic diversity could partly explain the poor uptake, but low R&D expenditures, pricing biases, insufficient investments in complementary investments (for example infrastructure), and unfavorable political economy factors also seem explain to the divergence between African and Asian agriculture (Djurfeldt and others 2005; Bezemer and Headey 2008).

A second problem with an agriculture-based strategy for Africa is that, relative to Asia, many African economies are abundant in oil or other mineral resources (Nigeria, Angola, Cameroon), and the group seems to be getting larger as countries like Chad, Ghana, and Uganda have recently started to develop large oil deposits. This naturally prompts some economists to argue that the comparative advantage endowed by resource abundance implies that agriculture has diminished in importance in Africa (Collier 2007; Dercon 2009). However, this argument seems to rely on some implicit assumptions that are questionable at best.
First, even if growth is regarded as the sole economic objective, the general equilibrium implications of oil revenues are not very favorable because oil sectors have weak and potentially negative linkages to other sectors (because of the inflationary effects of “Dutch Disease”). Second, if governments are trying to reduce poverty, then job creation is of the utmost importance. However, by themselves the oil and minerals sectors have very limited employment potential because they are capital intensive sectors. In other words, oil might have a comparative advantage in growth, but it certainly does not have a comparative advantage in poverty reduction.

A second weakness with the conventional comparative advantage viewpoint is that much of agriculture’s economic potential lies in the African market where there is ample scope to substitute food imports with domestic food production (Diao, Headey, and Johnson 2008). Even oil-rich Nigeria’s recent economic success has been predominantly driven by agriculture. From 2000–07 agricultural GDP growth in Nigeria accounted for almost half of the impressive doubling of national GDP, while the industrial sector accounted for just one-quarter. Hence over 2000–07, a period of rising oil prices, it looks like agriculture was the leading growth sector, not oil. Moreover, it so happens that many of Africa’s most mineral-rich countries are also those with tremendous biophysical potential for agricultural production. Nigeria has very good rainfall, relatively good soils, attractively large urban markets, good access to export markets via its coastal ports and its northern borders into the Sahel, and—despite high levels of population density in some parts of the country—large tracts of unexploited but fertile land. The Democratic Republic of Congo has similar if not greater biophysical potential, but larger infrastructure constraints (Ulimwengu and others 2009), and Angola is in a similar situation. Cameroon, which is gradually running out of oil, is probably Africa’s best example of strong agricultural growth in recent years, although it too has yet to fulfill its true potential in agriculture. The message here is that mineral abundance does not rule out an important role for agriculture. Indeed, one of the primary uses of increased oil revenues in Africa should be the promotion of agricultural and rural development.

A third objection often raised in the African context is that even if agriculture-based strategies were a good idea 50 years ago, it may now be too late to pursue this strategy because so many Africans have already left depressed rural areas in search of jobs in big cities (Bryceson 2002). Indeed our own results above might seem consistent with the conjecture. However, a closer look at the data suggests that this argument is probably overstated. In table 4 we again examine the arguably more reliable 2003 DHS data on employment for Nigerian men and women, since Nigeria is the most urbanized country of any size in sub-Saharan Africa. Several facts stand out. First, the proportion of the urban population share is probably exaggerated in Nigeria and perhaps elsewhere in Africa (Headey,
Bezemer, and Hazell 2008). The nationally representative DHS survey puts the rural population share at around 60 percent, which is consistent with a recent study that uses the spatially disaggregated data of GIS-type techniques to improve upon the UN’s widely criticized urbanization estimates (Uchida and Nelson 2008). Hence, more accurate data would imply that there is still a large rural population in Nigeria and other African countries that may not need any significant relocation in order to participate in agricultural activities. Recent in-depth studies suggest that participation in the agricultural labor market in rural Africa are far greater than large-scale household surveys suggest (World Bank 2008).

A second fact discernible from table 4 is that a large proportion of Nigeria’s male labor force in rural areas is unemployed (24 percent) or employed in low skilled nonfarm sectors, while most rural women are typically in low skilled services (55.7 percent). In conjunction with significant tracts of unused fertile land, these figures would imply that the prospects for a growing agricultural sector to provide meaningful employment for rural Nigerians stuck in low return nonfarm activities look favorable, especially since there are typically very few barriers to entry in agricultural labor markets. And in most other African countries the rural population share is much higher than in Nigeria. In short the vast majority of Africans (especially the poor) still live in rural areas and have adequate access to land. On these grounds, at least, agriculture-based strategies are certainly not redundant.

Table 4. DHS-based Estimates of Occupation Shares in Nigeria, 2003

<table>
<thead>
<tr>
<th>Not employed</th>
<th>Agriculture</th>
<th>Professional</th>
<th>Sales, services</th>
<th>Skilled manual</th>
<th>Unskilled manual</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men Rural</td>
<td>24.0</td>
<td>40.5</td>
<td>9.7</td>
<td>10.8</td>
<td>11.3</td>
<td>3.6</td>
</tr>
<tr>
<td>Total</td>
<td>27.1</td>
<td>27.8</td>
<td>12.5</td>
<td>13.5</td>
<td>15.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Women Rural</td>
<td>n.a.</td>
<td>27.9</td>
<td>5.7</td>
<td>55.7</td>
<td>7.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>n.a.</td>
<td>20.4</td>
<td>9.6</td>
<td>56.6</td>
<td>9.6</td>
<td>2.5</td>
</tr>
</tbody>
</table>

n.a. Not applicable.

Notes: Data are the percent distribution employed in the 12 months before the survey. Key statistics are highlighted in italics.

rapid urbanization is generally associated with rising urban unemployment for the reasons listed above, as well as significant problems with public service delivery (Hewett and Montgomery 2001). African experiences like Nigeria's show that urbanization alone is simply not enough to sustain durable and widely shared growth. Moreover, agricultural development should not always be thought of as competing with nonagricultural growth processes. Agriculture can actually support the growth of cities by increasing demand for nonfarm services, by keeping food prices low (which in turn keeps real urban wages competitive), and by freeing up scarce foreign exchange for industrial imports rather than food imports. Because of these spillovers it is no coincidence that Asia turned into the world's factory after experiencing a smallholder-based Green Revolution, and that the reverse is true in sub-Saharan Africa where urban food prices are often surprisingly high and manufacturing is generally uncompetitive (Headey, Bezemer, and Hazell 2008).

Finally, most of the existing arguments about the sectoral role of policies relate to comparisons of the expected benefits of agricultural and nonagricultural growth in terms of growth and poverty reduction. But in theory an optimal development strategy requires allocating investments until marginal cost–benefit ratios are equalized across sectors. In reality, however, we have very little data on the returns to various public expenditures, especially in Africa. What data there are generally indicate high social returns to agricultural R&D and rural infrastructure (see Fan 2008 for various case studies in Asia and Africa), but against this evidence runs a significant tide of mostly anecdotal assessments of the weakness of Africa's agricultural ministries (Headey, Benson, and Kolavalli 2009) and the poor state of its agricultural R&D institutions (Pardey and others 2006).9 Perhaps the only encouraging view vis-à-vis these assessments is that Asia's Green Revolutions were primarily driven by government elites rather than their own poorly regarded agricultural ministries (World Bank 2008).10 In this view the binding constraint is not the capacity of agricultural ministries but the political will of the governing elite.

Development Strategies for Managing the Transition out of Agriculture

This article has identified a startling divergence in the agricultural exit paths of developing countries. While economic growth is traditionally accompanied by more rapid agricultural exits, fast-growing East Asian countries have generally only experienced modest ones. Slow-growing Africa, in contrast, has often witnessed surprisingly rapid agricultural exits, and in some oil-rich countries—Nigeria, Cameroon, Gabon—extremely rapid ones. To some extent these different
paths are the result of different endowments, but very different policy regimes also explain the divergence, especially the success of the Green Revolution in Asia and its failure in Africa.

Despite this historical divergence, we have argued in this paper that Asia is still facing some daunting employment problems. In Asia there is a paradoxical food situation today. On the one hand, there are millions of increasingly affluent Asians who are rapidly diversifying and enriching their diets. Yet despite this growing food affluence for many, about 800 million Asians still live in abject poverty, and hunger and malnourishment are surprisingly persistent. These people desperately need better livelihood opportunities. In the nonfarm sector, rural–urban migration (especially from less favored areas) could often be the best solution, but recent evidence suggests that Asia’s manufacturing sectors are struggling to create enough jobs (Khan 2007). This suggests that Asia’s rural economies need to continue providing new job opportunities. In agriculture the most promising prospect for poor Asian farmers is to tap into urban-led economic growth, particularly the shift toward more affluent Asian diets. Yet the key lesson of the Green Revolution is that, if left to market forces alone, many poorer regions and poor people are likely to be left behind in modernization processes (Rosegrant and Hazell 2000). Asia’s high population density also implies that the RNF sector may have a comparative advantage in employment creation because transaction and labor costs in rural Asia are generally low. Yet Asia’s RNF sector is still been hindered by the neglect of government policies, especially those relating to rural credit, education, and infrastructure (Haggblade, Hazell, and Reardon 2007a). So for all their success to date, Asian governments have unfinished business in the war against rural poverty.

In Africa, this war has scarcely begun. Despite rapid urbanization in a few countries, most of Africa’s poor still reside in rural areas and still rely on agriculture to eke out a living. Even in Nigeria, Africa’s largest economy and the one in which the agricultural exodus is starkest, agricultural growth still has considerable potential to reduce rural and urban poverty. So the real question in Africa is arguably not whether agriculture has potential, but how that potential can best be exploited. The main lesson Africa can learn from East Asia is that labor-intensive agricultural growth in egalitarian tenure systems is extremely pro-poor and can provide the foundation for successful nonfarm diversification (Bezemer and Headey 2008).

Yet Africa’s capacity to simply transplant the Asian Green Revolution model is limited. Africa is not only geographically more diverse, its political economy is also different. Asia’s agricultural initiatives were sparked by a combination of famines, higher food prices, and nationalist politics. In most of Africa’s more fertile countries the production of food staples has often been ignored because basic food security was less of an issue historically, because natural resources and
traditional cash crops offered more lucrative earnings for government coffers, and because nationalist tendencies were undermined by ethnic conflicts. For these and other reasons food security has typically only been regarded as a high priority in drought-prone areas such as Ethiopia, Malawi, and the Sahelian countries. However, one of the few beneficial effects of the global food crisis of 2007–08 is that the political support for improving national food security has undoubtedly been reinvigorated in a number of African countries. The question is whether this political momentum will last and whether agriculture’s champions in the continent can use that momentum to develop more coherent and more sustainable agricultural development strategies.\footnote{Notes}

Notes
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2. Note, however, that GDP data is biased by the omission of the informal economy, which seems to be predominantly in the nonfarm sector. For example, despite no economic growth over 1960–2000, Nigeria appears to have experienced a large exodus of workers out of agriculture, but relatively little decline in agriculture’s share in GDP. Much of this could be attributed to the informal sector. See Headey, Bezemer, and Hazell (2008) for further discussion.
3. Other developing regions are also of interest, although the Middle East and North Africa and most Latin American countries generally started from higher income levels. However, many of these countries appear to have urbanized very quickly. Whilst comparisons between Latin America 30 or 40 years ago and Africa today would make for interesting research, in this paper we focus on the starker contrast between Africa and developing Asia.
4. South Korea is not included: it did not follow the standard Asian path in that it urbanized very quickly, partly because of a weaker nonfarm sector relative to comparable countries such as Taiwan (Otsuka 2007).
5. We also note that Nigerian data is complicated by the high rates of unemployment reported in both urban and rural areas (above 20 percent). We have allocated unemployment according to the nonfarm shares of the remaining categories.
6. An obvious caveat to this concern is that supply begets its own demand. However, Asia’s growth model has heavily relied on external demand, which is not inelastic. Moreover, the least developed Asian countries are facing a challenge that previous Asian Tigers did not encounter because the latter tended to grow in sequential phases with quite complementary shifts in economic structures—the so-called ‘flying geese’ phenomenon—and among them only Japan could truly be called populous by Asian standards. In contrast developing Asia is now characterized by a large number of countries—China, India, Indonesia, Pakistan, Vietnam, Bangladesh—that are highly populous, at similar stages of development, and all in need of significant job creation outside of agriculture.
7. Specifically we assume a two-sector economy with agriculture (A) and nonagriculture (N). By definition, the annual growth in employment \((g^A)\) equals the annual growth rates in output of agriculture \((g^A)\) and nonagriculture \((g^N)\), multiplied by their initial employment shares \((s^A, s^N)\), and
their (full) employment elasticities with respect to output \((e^A = 0.5; e^N = 0.3)\). Rearranging this identity, we can derive the nonagricultural growth required to achieve full employment based on three key characteristics of the economy: (1) the relative labor intensities of agriculture and nonagriculture; (2) the share of agricultural employment \((=70 \text{ percent})\); and (3) the agricultural growth rate (which is set equal to population growth rate, assumed to be 2.9 percent). The full employment nonagricultural growth rate is then given by:

\[
g^N = \frac{(g^d - s^A e^A g^d)}{s^N e^N}.
\]

8. Of course this statement ignores the role of linkages. It is possible that exogenously determined oil revenue might have caused increased demand for agricultural produce or increased prices, hence stimulating agriculture. But it is difficult to imagine that when industry grows by 25 percent, it causes agriculture to grow by 50 percent, implying a multiplier of two.

9. Much of the quantitative evidence on expenditure effectiveness relates to budgetary measures, such as the ratio of actual expenditures to planned expenditures for various ministries. By this measure public expenditure reviews in Africa typically reveal that ministries of agriculture fare poorly relative to many other key ministries such as health and education. See Headey, Benson, and Kolavalli (2009) for some discussion.

10. Background research on agricultural ministries for the 2008 WDR was conducted by Regina Birner and colleagues at the International Food Policy Research Institute, but these authors could not find a single example of a reformed agricultural ministry that was widely regarded as a success story (personal communication). This state of affairs is reflected in the common joke that if you removed the agricultural ministry, the rural population wouldn’t notice—and vice versa.

11. For a number of examples of recent work on agricultural strategies in Africa see International Food Policy Research Institute’s (IFPRI) publications homepage (http://www.ifpri.org/pubs/pubs.htm), the World Bank’s Agricultural and Rural Development website, as well as the recent review of Ethiopia’s Agricultural Demand-Led Industrialization (ADLI) strategy by Dercon and colleagues, summarized in Dercon and Zeitlin (2009).

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Are All the Sacred Cows Dead? 
Implications of the Financial Crisis for 
Macro- and Financial Policies

Aslı Demirgüç-Kunt • Luis Servén

The recent global financial crisis has shaken the confidence of industrial and developing countries alike in the very blueprint of the financial and macro policies that underlie the Western capitalist systems. In an effort to contain the crisis from spreading, the authorities in the United States and many European governments have taken unprecedented steps of providing extensive liquidity, giving assurances to bank depositors and creditors that include blanket guarantees, structuring bail-out programs that include taking large ownership stakes in financial institutions, and establishing programs for direct provision of credit to nonfinancial institutions. Emphasizing the importance of incentives and tensions between short term and longer term policy responses to crisis management, the authors draw on a large body of research evidence and country experiences to discuss the implications of the current crisis for financial and macroeconomic policies going forward. JEL codes: G01, G21, G28, G32, E52, E58, F32

The financial turmoil that started as a meltdown in structured securitization instruments in the summer of 2007 in the United States and the United Kingdom has quickly spread to the rest of the industrial world, and has now become a full-blown global financial crisis. In an effort to contain the crisis from spreading, the authorities in the United States and many European governments have taken unprecedented steps of providing extensive liquidity, giving assurances to bank depositors and creditors that include blanket guarantees, structuring bail-out programs that include taking large ownership stakes in financial institutions, and establishing programs for direct provision of credit to nonfinancial institutions. In some developing countries, there is talk about reintroducing capital controls as a policy of last resort in the event of extensive bank runs and capital outflows.
Also questioned is the wisdom of a monetary policy narrowly focused on goods prices without taking into account asset price inflation, and prudential regulation that does not recognize systemic vulnerabilities.

Hence the crisis has shaken the confidence of industrial and developing countries alike in the very blueprint of the financial and macropolicies that underlie the Western capitalist systems. It is not surprising that many analysts are already declaring capitalism, and the mainstream policy view associated with it, to be dead.

We argue that the "sacred cows" of financial and macropolicies are very much alive. We seek to make clear that (i) the ongoing crisis does not simply reflect a failure of free markets, but is a reaction of market participants to distorted incentives; and (ii) managing a systemic crisis requires policy decisions to be made at different stages of the crisis—the immediate containment stage as well as the longer-term resolution and structural reforms that follow—which often entail difficult trade-offs between re-establishing confidence in the short term and containing moral hazard in the long term.

Keeping in mind the importance of incentives and tensions between short-term and longer-term policy responses to crisis management, we address the following questions about the implications of this crisis for financial and macroeconomic policies going forward:

- Are blanket guarantees inevitable to halt a systemic crisis?
- Should governments bail out and take ownership of financial institutions?
- Should governments regulate finance much more aggressively given the failures in market discipline?
- Should monetary policy target asset prices?
- Should countries resort to capital controls to contain the crisis?

Crises recur in part because people forget the lessons from previous crises. While every crisis is different, past crises also provide important lessons that need to be learned to prevent policymakers from reinventing the wheel every time a new crisis erupts. We draw on past research and country experiences to address the issues that are at the forefront of policy debate today.

### Use of Blanket Guarantees in Containing a Systemic Crisis

Crises go through different stages. The first is called the "containment" stage in which crises often emerge unexpectedly and evolve very quickly. This is the stage that attracts the most attention, with bank runs, emergency liquidity loans, and weekend crisis meetings. Time is of the essence and the need for speed generally takes over good judgment. How should the authorities judge whether liquidity
support or official guarantees should be employed in the hope of preventing col­
lapse, but potentially at high long-term costs?

Part of the answer lies in better crisis preparedness. Systemic crises are
infrequent events. Hence, the incumbent policymakers often claim there is "no
playbook" for handling crises. This lack of experience and knowledge leads
to trial-and-error policymaking and copying of policy responses—and often
mistakes—that are being employed elsewhere.

In the latest crisis the U.S. and European governments provided extensive assur­
ances to bank depositors and creditors that included blanket guarantees in many
cases. Some developing countries copied these arrangements, providing blanket
guarantees in order to prevent capital outflows and assure the public about the
safety of their banking systems. But other countries have resisted the need to
do so. 3

It is important to recognize that careful crisis containment strategies are very
difficult to devise in the midst of an actual turmoil. Political pressures to rescue
powerful interests are often too difficult for the authorities to resist. Because the
crisis seriously threatens the political future of the incumbent governments, the
usual short-termism in policy decisionmaking is even more exaggerated. Avoiding
such mistakes requires that crisis-management decisions are made in an open
debate outside of an actual crisis. Accountability would be improved by requiring
that regulators establish and regularly test a well-publicized benchmark plan for
crisis resolution (Caprio, Demirgüç-Kunt, and Kane 2008).

What Should Be Done in the Containment Stage?

Walter Bagehot's (1894) classic policy advice for managing liquidity during a sys­
temic crisis is for the central bank to lend freely to solvent banks—but in order to
minimize the subsidizing of risk-taking (moral hazard), the loans are to be made
at penalty interest rates and only on good collateral. Put differently, the advice is
for governments to avoid lending to insolvent banks at all, even on good collat­
eral, and certainly not at below-market interest rates. Unfortunately, as the recent
events illustrate, modern governments pay only lip service to this principle. For
governments to embrace Bagehot's advice, they need to be able to distinguish
relatively quickly between deeply insolvent banks and those that are solvent
enough to be salvageable. They also need to have the strength to resist the press­
ures that a crisis usually generates to rescue powerful interests.

In a banking crisis, just like at a battlefield, regulatory authorities need to run
to the aid of wounded deposit-losing institutions and temporarily stabilize their
condition by providing liquidity. Effective crisis containment requires effective
triage: treatment-worthy institutions need to be identified and provided with
enough liquidity to restore public confidence in their ability to continue in
operation. Unless emergency response teams are assembled and trained in advance, it is difficult to conduct good triage—a point which again stresses the importance of crisis preparedness.

Also very important are information problems, as the recent subprime crisis amply illustrated. Distinguishing viable institutions at short notice becomes more challenging in environments characterized by low levels of transparency. Therefore it is the duty of regulators to identify and remedy gaps in information well in advance, and recognize the gradual reduction in transparency that comes with financial engineering and regulatory arbitrage and to nip it in the bud by demanding improvements. Regulators also need to encourage the use of instruments and the development of markets that would help to yield more accurate assessment of risks, both in and out of crisis situations.\(^4\)

When transparency is allowed to deteriorate, information problems can tie the hands of authorities and limit their ability to engage in efficient containment strategies. For example, advocates of bailing out insolvent institutions to halt a systemic crisis argue that only sweeping guarantees and extensive support can stop the panicky flight of depositors and other creditors. This is of course true if the crisis entails a series of self-fulfilling runs as envisioned in Diamond and Dybvig (1983). However, most modern financial crises, including the recent one, are driven instead by fundamental weaknesses in economic balance sheets, which reveal themselves initially as liquidity problems.

It must be recognized that the short-term benefits of guarantees will vary with the fiscal strength of the guaranteeing government. To hasten the end of an insolvency-driven banking crisis and to constrain the spread of insolvencies in the short term, the government must manifest a \textit{substantial} capacity for absorbing losses. This is not a luxury most countries can afford since most governments do not have the required fiscal capacity. Depending on the depth of the systemic insolvency, such support may not even halt the spread of the crisis, but merely delay healthy adjustments. This begs the question of whether social costs and adverse distribution effects could be reduced by following an alternative strategy.

Even in the midst of a financial crisis, it is inefficient to set aside long-term goals completely. The manner in which a crisis is resolved affects the frequency and depth of future crises through the significant impact it has on market discipline. Providing extensive liquidity support and guarantees to insolvent institutions subsidizes their gambling on their own resurrection and distorts risk-taking incentives, undermining market discipline and spawning future crises (Kane and Klingebiel 2004; Calomiris, Klingebiel, and Laeven 2005). If institutions can count on crisis resolution to be handled in this way then they will be more willing to risk insolvency, and safety-net subsidies will mainly flow to institutions that take excessive risks at the expense of taxpayers. The short-term benefits of such bailouts have been oversold. Such policies seldom actually speed
the recovery of a nation’s real economy from a financial crisis or lessen the
decline in aggregate output. Instead, providing liquidity support for insolvent
institutions often prolongs a crisis. It does this by distorting risk-taking incentives
so extensively that sound investments and healthy exits are delayed and additional
output loss is generated. Honohan and Klingebiel (2003) and Claessens,
Klingebiel, and Laeven (2005) measure the impact of different crisis management
strategies on the ultimate cost of resolving financial distress in a broad set of
countries. They find that providing generous support—in terms of open-ended
liquidity support and blanket deposit guarantees—not only increases the ultimate
fiscal cost of resolving crises, but also that it does not speed the recovery, instead
prolonging the duration of the crisis.

Using a sample of 42 banking crises Laeven and Valencia (2008) also show
that blanket guarantees have little impact on domestic deposits (they pretty much
continue their trend), but more often than not exacerbate the decline in foreign
liabilities. Indeed, announcement of a blanket guarantee is almost taken as a
signal to start a run on a currency. Not surprisingly guarantees are often
accompanied by increases in liquidity support, increasing the fiscal cost signifi-
cantly. Indeed it is important to note that empirical evidence suggests that govern-
ments incur most of the fiscal costs of resolving the crisis during the containment
phase. Honohan and Klingebiel (2003) show that much of the variation in the
fiscal costs of crises is explained by differences in the way a government handled
its liquidity crisis, with the highest costs associated with governments that pro-
vided open-ended liquidity support and blanket deposit guarantees.

Alternatives to Blanket Guarantees

Providing blanket guarantees poses many challenges to government authorities.
The first important challenge is to convince creditors and depositors that they
have the political will and fiscal capacity to afford the cost of such guarantees.
This may be quite difficult for many governments of developing countries. If the
emergency response is seen as inadequate, it may quickly compound the prob-
lems, requiring emergency funding from external sources, such as resource-rich
governments or the International Monetary Fund.

Even if the guarantees provided are deemed credible and the crisis is contained,
the governments still face a second set of important challenges. These include:
the need to control the additional (guaranteed) debt that insolvent institutions
will continue to attract; to make sure the guaranteed institutions invest these new
resources prudently; to reduce or eliminate the guarantees once the containment
stage of the crisis is over. Regulators are likely to find it very difficult to address
the moral hazard created by these guarantees. Because fully guaranteed insti-
tutions can attract funding independent of the risks they take, managers of
insolvent institutions can be easily tempted to abuse their government assistance by gambling on their resurrection.

There is already a large literature which establishes that in normal times overly generous safety-net policies and deposit insurance will lead to moral hazard and financial instability.\textsuperscript{5} The longer the guarantee remains in place, and insolvent banks are allowed to operate, the more difficult it will be to curb these excessive risk-taking incentives. Furthermore, once installed, such guarantees are difficult to claw back and, more importantly, they seriously undermine the credibility with which future safety net arrangements can be limited.

While introduction of blanket guarantees may be tempting for policymakers in the short term, they are not inevitable. Provision of such extensive guarantees represents an extreme measure that is best resisted before other alternatives are exhausted. Ideally, policymakers must be ready to take the time to separate hopelessly insolvent institutions from potentially viable ones, and to provide liquidity support, guarantees, or “haircuts” in a way that would protect taxpayer interests. Hence an alternative strategy to an indiscriminate blanket guarantee is to take a “banking holiday” over several days in order to identify insolvent institutions and to recommend and impose preliminary haircuts on uninsured depositors and non-deposit creditors before they can liquidate their claims (Kane and Klingebiel 2004). Using the holiday to prepare a program of limited guarantees and to write down the uninsured debt can restore public confidence both in the government’s ability to deal with the crisis and in the banking system itself.

Baer and Klingebiel (1995) examine the aftermath of pre-1992 systemic crises in a number of countries and find that in cases where the governments assigned losses to depositors of insolvent banks, the positive effects of reducing depositor uncertainty quickly overcame the negative effects that surviving banks experienced from depositor write-downs. Fairness requires that small depositors—who are often more than covered by explicit deposit insurance schemes—have immediate access to their funds. By the same token, at the end of the holiday, larger uninsured depositors should also be allowed immediate fractional access to their transaction balances. Clearly the speed with which the authorities can deal and resolve these situations depends on the extent to which they have engaged in contingency-planning and crisis-management simulations.

A holiday that lasts for weeks or months is called a “deposit freeze,” and this reduces depositors’ liquidity and the nation’s aggregate money supply; it may also have long-term adverse effects on depositor confidence.\textsuperscript{6} Hence to minimize these adverse effects, insured depositors should be granted access to their funds as soon as this is feasible. It is also important to note that it is not necessary for banks to close for triage to begin. In a systemic crisis, bank holidays may be prolonged because it may be difficult to complete the investigation of all banks quickly. Hence, banks may continue to operate during inspections, though the deposit
An insurer may be given a right to void large loans and withdrawals made from a bank within a certain period of its closure. This would make large transactions subject to clawback, but it would not interfere with the business of ordinary households while the inspections are going on.

Broader time-out strategies for creditors that follow bankruptcy proceedings can also be employed. Productive assets can be conserved by instituting a grace period during which major creditors do not receive payments of principal or interest due on existing bond or loan contracts, but use the time to work out a replacement contract structure with the help of courts, mediators, or both. Forcing private creditors to renegotiate unenforceable contracts is called “bailing-in,” and, like haircuts imposed on uninsured depositors, is intended to trap creditors that financed weak institutions into participating more fully in loss-sharing.

Whichever strategy is used, ultimately the damage the crisis causes to the country’s financial sector and its real economy is reduced by separating the insolvent from the viable institutions as quickly as possible and by providing support and allocating losses in ways that protect taxpayers and avoid subsidizing the go-for-broke strategies of insolvent institutions. Prior crisis planning and commitment to these plans are important steps in being able to retain a long-term perspective in the containment stage of any crisis.

The Role of the State in the Financial System

After the panic abates, confidence is restored, and markets start functioning again, the crisis moves into its resolution stage. With the crisis contained, policies must now be chosen to deal with the undercapitalization and insolvencies that are often revealed. Past research and experience provide many valuable lessons on how best to deal with systemic insolvencies, an issue we discuss below.

Given the intensity of the recent crisis, direct interventions in the financial system have been so massive that by the end of 2008 governments will be the largest shareholders in most developed economies’ financial industries, reversing a trend of state retreat over the last 20 years. With $500 billion or more invested, this is equivalent to roughly state ownership of a quarter of the industry’s market value, which strongly contrasts with the ideology of Western capitalist systems. Indeed, the extent of these interventions and the increasing government stake in financial institutions have led to questions as to whether financial systems should be privately owned in the first place, shaking the commitment of developing country policymakers to ongoing bank privatization programs. If private banks are prone to excessive risk-taking leading to crises and costly bailouts, is it not better to have the governments own and operate the financial system in the first place?
In answering this question it is important to recognize that bank nationalizations are very common ways of dealing with systemic financial crises. Indeed, governments have always taken ownership positions in banking either deliberately or indirectly as a result of banking crises. In almost every major banking crisis in recent history—in East Asia, Latin America, and other countries—governments have become temporary caretakers of financial institutions. Hence, the recent crisis is not the exception in this regard. But the way in which this is done has important implications for maintaining and restoring a functioning financial system and minimizing the short term and long term costs of such interventions. But the fact that governments find themselves involved in resolution of insolvencies does not imply this role should be permanent. On the contrary, all evidence suggests that they would be well-advised to do otherwise.

Bureaucrats as Bankers?

Government ownership of banking has been popular throughout history. Early proponents of state control argued that the government can better allocate capital to highly productive investments. Gerschenkron (1962) was among the first to argue that private banks would not be able to overcome deficiencies in information and contracting in weak institutional environments. State ownership also makes appropriation of the surplus from finance and directing credit much easier, making it attractive for policymakers. Moreover, there is the concern that private ownership and concentration in banking may lead to limited access to credit by different parts of society, so hampering the development process. Indeed, government banks are often expected to expand access, making financial services more broadly available. A final argument is rooted in the fragility of finance, and that private financial institutions are too prone to excessive risk-taking, which is difficult to keep under check; a popular sentiment that resurfaces with every significant crisis.

By now there is a significant amount of empirical research that suggests state ownership of banks is associated with less financial sector development, lower growth and lower productivity, and that these negative effects are more pronounced at lower levels of income with less financial sector development and with weaker property rights’ protection (Barth, Caprio, and Levine 2001; La Porta, Lopez-de-Silanes, and Shleifer 2002). Despite explicit mandates for government banks to expand outreach, in banking systems dominated by state banks there are fewer bank branches and automated teller machines. Customers in such systems face lower fees but they also experience poorer service quality (Beck, Demirgüç-Kunt, and Martinez Peria 2007, 2008). There are some exceptions in that certain state-owned banks, designated as development finance institutions, have become effective providers of know-how and have had a useful catalytic
function in “kick-starting” certain financial services, for example in Latin America (De la Torre, Gozzi, and Schmukler 2007). But even then the most successful of these initiatives are expected to be privatized.

Instead, the bulk of the evidence suggests that state-owned banks tend to lend to cronies, especially around the time of elections, as vividly illustrated by the recent empirical studies of Cole (2004), Dinç (2005), and Khwaja and Mian (2005). For example, Cole has shown that state banks in Indian states ramped up agricultural lending in tightly contested districts in election years. Dinç showed that increased lending by government-owned banks right before elections is not specific to India but can be observed in data from 22 developing countries. Drilling down to the individual loan level, Khwaja and Mian found evidence from Pakistan that politically active borrowers were able to secure larger and cheaper loans from state-owned banks and that they defaulted on these loans much more than other business borrowers.

Given the extent to which lending policies are politicized, it is not surprising that state ownership appears to heighten the risk of crises instead of reducing it. If anything, research suggests that greater state ownership is associated with various measures of financial instability, including a greater probability of banking crises (Caprio and Martinez Peria 2000; Barth, Caprio, and Levine 2001; La Porta, Lopez-de-Silanes, and Shleifer 2002).

These results and other related evidence explain why many countries embarked on privatization programs, selling their state banks. Indeed, evidence also suggests bank privatization, if well-designed, can significantly increase bank performance (Clarke, Cull, and Shirley 2005; Megginson 2005). To be sure privatization is difficult and can lead to problems in weaker institutional environments. Hence the sequencing is important: moving slowly but deliberately with bank privatization, while preparing state banks for sale and addressing the weaknesses in the overall incentive environment and regulations, seems to be the preferred strategy. Ultimately, gains from privatization—if designed properly—can be substantial since the alternative of maintaining large state ownership can significantly undermine real sector reforms and deter economic development.11

So what explains the poor performance of bureaucrats as bankers? As often the case in finance, incentive problems are at the root of this issue since bureaucrats do not face incentives designed to reward efficient resource allocation. Not only do government officials often lack the expertise to be effective managers, they also face conflicts of interest due to their desire to secure their political base and reward supporters, which often goes against efficient resource allocation. These problems become worse with fewer checks and balances and in poorer institutional environments, explaining why state ownership is more damaging at lower per capita income levels (Keefer, 2000; La Porta, Lopez-de-Silanes, and Shleifer 2002).
Hence while governments may inevitably find themselves as stakeholders in financial institutions as the outcome of systemic crises, they would do well to see this as a temporary arrangement and plan for their exit as part of the crisis resolution exercise. Despite its weaknesses, a well-functioning private financial system is crucial for promoting development, and substituting government provision of financial services for that of the market is likely to lead to inferior outcomes. Economic growth does not resume on a sustainable basis until productive assets and banks are back in the hands of well-capitalized private parties.

But how should financial crises be resolved and solvency of institutions restored? In other words, how should bail-out programs be designed in the event of crises, and what should be the government’s role in this process?

**Bureaucrats as Caretakers**

If bureaucrats are not good bankers in good times, they are not likely to do better in bad times, given that the tendency for political forces to dominate economic judgments will be even stronger. As we have seen in the latest crisis, systemic crises often involve the injection of substantial sums and the determining of the financial fate of powerful interests. But systemic crises often require comprehensive solutions by the government. So how should governments behave?

While governments should be prepared to act in a systemic crisis, the approach and the actions they take still need to be designed to reduce conditions for moral hazard and the likelihood of a subsequent crisis. This should be done by imposing real costs on all responsible parties and getting the resources back in productive use as soon as possible (Demirgüç-Kunt, 2008).

To see the importance of paying attention to incentives, consider what happens to firms outside the financial sector that fall into a state of insolvency. Those in control of the firm find it difficult or impossible to raise new funds in any form. They can no longer act on profitable investment opportunities and may be forced to sell important assets. Creditors recognize this situation may distort the incentives of managers, making them more susceptible to fraud and moral hazard, which at the very least reduces the incentives of the owner and managers to exert effort. In a market economy, the solution is bankruptcy. As long as the firm is economically viable, it makes sense to continue its operations, but only after restructuring. This restructuring generally wipes out existing equity holders, while debt holders often have a portion of their claims converted to equity. Alternatively debt holders can agree to cut down the face value of their debt in exchange for some warrants. Old management is often replaced, a substantial portion of the firm’s assets are sold, and workers are laid off. This restructuring is not a mere reworking of the firm’s balance sheet, but represents very real changes to the way it does business, perhaps even in the business it does.
The happy result for the economy is that resources continue in their best use, while all responsible parties incur some costs for the firm’s poor performance.

To a large extent dealing with financial insolvencies should follow the same general principles. Admittedly the financial sector is special due to its particular fragility, the possibility of contagion, and the major macro-implications when it is in systemic distress. However, although these differences may justify different approaches, they do not suggest that incentives matter any less. Any government involvement should be designed to protect the interests of the taxpayers, impose losses on the responsible parties, and use the private sector to pick the winners and losers. For example any plan that purchases bad assets from troubled financial institutions, or recapitalizes without extracting some claim from the institutions, amounts to a transfer from taxpayers to shareholders, which is the group that keeps the residual value of the entity.

Recapitalization of the banking system should be designed so that those banks that need assistance with recapitalization are helped in an incentive-compatible way. Such a plan would limit taxpayers’ loss exposure, and, in environments with good information and contract enforcement, leave resolution of bad assets to the banks themselves. But how should the banks be recapitalized? Just as bureaucrats are likely to make poor bankers, the selection of individual winners and losers is also what markets, not governments, do best.

One way is for the authorities to inject funding only to those institutions that are able to meet the following criteria (World Bank 2001; Honohan 2005):

- Those institutions that are in a strong position should be able to raise capital privately, say from a syndicate of private banks. If the institution has difficulty raising capital, it should at least be able to obtain some proportion of it—at least half of it or more—from the private sector before applying for government recapitalization assistance. Only those institutions that can secure private sector funds would be eligible for the plan. This will ensure that the private sector plays an important role in picking the survivors.12
- Those institutions that are eligible receive government assistance in the form of preferred stock. Preferred stock status would force private parties rather than taxpayers to bear the first-tier losses.
- Any bank participating in the plan will have to suspend all dividend payments (and restrict the amount and structure of its compensation plans for its senior managers) until the government is fully “bought out.” The bank will also agree to comply with strict regulations on its leverage, risk-taking, transparency, and disclosure in order to participate in the plan. This will give incentives to banks to retire their preferred stock as soon as possible.

These are tough criteria and only desperate banks will agree to these terms. Which is exactly the point: government assistance should only be injected into
banks in dire straits, yet simultaneously to those with a real chance of survival. As long as the amount of funding is such that some banks fail, this approach removes government from decisions as to which banks survive. The availability of private sector funding serves to identify the candidates, and restrictions on different ways to take these funds out of the banks, combined with greater transparency, makes it more likely that the banks will not be looted or engage in gambling with taxpayers’ money. By openly stating the terms on which it will assist banks, and ensuring that those terms provide good incentives for the restructured bank going forward, the government will have made the best use of market forces while minimizing its direct ownership involvement. Many of these features characterized the U.S. Reconstruction Finance Corporation’s (RFC) program of taking temporary preferred equity positions in banks after the great depression.13

Another alternative that has gained popularity after its successful application in Spain in the early 1980s is a centralized approach where banks’ nonperforming loans are carved off into an asset management company (AMC) which continues the restructuring process. The carving-out of an insolvent bank’s bad loan portfolio and its organizational restructuring under new management and ownership may be appropriate when large parts of the bank’s information capital is dysfunctional. The bad loan portfolio may be sold back into the market or disposed of by a government-owned AMC.

A survey by Klingebiel (2000) shows, however, that the AMCs formed in developing countries have not been as successful in restructuring nonperforming loans. The effectiveness of AMCs has been quite mixed, better when the assets to be disposed are primarily real estate, less good when they are loans to large politically connected firms. In countries with developed private markets and institutions, individual banks—if well capitalized—would be in a superior position to engage in restructuring their own assets. But policymakers in weak institutions should not expect to achieve the same level of success in restructuring as those in more developed economies, and they would do well to design simple resolution mechanisms that offer little discretion to government officials (Honohan and Laeven 2005).

In summary, governments are not good at providing financial services in normal times or in crises, and those governments that find themselves as bankers as a result of such crises should focus on their exit strategy as quickly as possible, using the market to identify winners and losers. And although drawing on public funds to recapitalize some banks may be unavoidable in systemic crises, they must be used sparingly for leveraging private funds and incentives (World Bank 2001). Hence, although finance is prone to excesses and crises, there is a substantial literature that suggests government ownership is not the answer. Where governments have a very important role to play in finance, it is in providing the
regulatory and supervisory arrangements that help reinforce incentives that limit this excessive risk-taking and fraudulent behavior.

Design of Prudential Regulations

One important implication of the recent crisis is the widespread calls for reforms of regulation and supervision. The initial reaction to the emerging crisis was one of disbelief: how could the crisis emerge in countries whose supervision of credit risk had been thought to be the best in the world? Indeed, the regulatory standards and protocols of these countries were in the process of being emulated worldwide through the international capital accords, known as the Basel standards.

Basel II—which is currently in its implementation stage—grew out of concern that the Basel I accord was unable to address the range of risks in bank activities, as evidenced by the growth of securitization. Basel II is built on three pillars: (1) minimum regulatory capital requirements for credit risk, operational risk, and market risk; (2) the supervisory review process; and (3) market discipline and disclosure. The minimum capital requirements are determined by either external ratings from ratings agencies for smaller banks or by outputs from the larger banks’ own internal ratings models.

Many interpreted the crisis as a vivid example of market failure, evidence that there is no such thing as market discipline, reinforcing calls for stronger regulations through improvements in the Basel II accord. But the crisis also spawned a growing argument about the role that the Basel I accord may have played in causing the crisis. Indeed, it is no secret that Basel I contributed to the growth in securitization by assigning lower capital charges and thus giving incentives to institutions to move their assets into off-balance-sheet securitization vehicles. While advocates claimed that Basel II, had it been implemented earlier, could have lessened or prevented the turmoil, critics of the Basel approach to capital regulation pointed out that the crisis has simply reconfirmed fundamental flaws that have been evident in this approach.

The financial turmoil challenged the Basel II framework in important ways. First, the events raised serious questions about setting capital requirements based on external ratings. These ratings proved excessively optimistic and confirmed long-standing concerns about the conflicts of interest that arise out of having the issuers pay the agencies for ratings required by regulators. More importantly, credit ratings are not appropriate for setting capital requirements. Ratings are based on expected default rates, yet capital is intended for unexpected losses. Ratings can be useful for establishing loss reserves for particular assets, but they do not consider correlations among assets, hence they are not helpful in assessing...
how a bank's net worth or its portfolio of assets may vary. Therefore the amount of capital required for an institution's safety has to be linked explicitly to measures of volatility of its earnings, which is not information that ratings provide.

Second, the crisis raised serious concerns about the accuracy of internal risk models employed by even the largest and most sophisticated market participants. These models proved inadequate and illustrated how financial models and datasets can be manipulated to provide desired outcomes.

Third, the way the crisis emerged in subprime lending but spread to other securities revealed problems with inadequate documentation, the disconnect between the source of risks and the bearers of those risks, and lack of knowledge about how risks are ultimately distributed. All these point to weaknesses in the disclosure provisions included in the market discipline pillar of the Basel accord, and how fundamental issues of transparency were not addressed.

Given the intensity and persistence of the crisis, many proposals for regulatory reforms are emerging. Some proposals originate from sources that interpret recent events as evidence that market discipline is not reliable and want to focus on designing tougher and more comprehensive regulations. These proposals range from re-establishing extensive activity restrictions, to speedier implementation of Basel II, to revising the accord in order to address the weaknesses discussed above, to enhanced opportunities for further official intervention. Others continue to believe in the reliability of market signals and market discipline, and argue that the Basel approach is fundamentally flawed. On the hypothesis that investors would be quicker to recognize changes in risk and risk premiums, such sources propose an alternative approach where official supervision would focus on generating and using better market signals.

The main features of this approach can be summarized as follows. While the Basel Committee has been responsive to its critics by trying to make the capital requirements more reflective of the ways in which risks and vulnerabilities are assessed, this has led to greater and greater complexity. Increased complexity in bank regulation reduces transparency but increases the scope for regulatory arbitrage and forbearance, without necessarily increasing accuracy. Indeed, these critics argue that while the task of computing correct economic capital for banks is very difficult and complex, bank capital regulation need not be. An alternative is to rely in large part on the market itself to provide a measurement of risk, together with the enforcement of simple rules such as the leverage ratio and prompt corrective action, which are not subject to manipulation. Supervisors must not only draw on—but also help develop—informative market signals such as those imbedded in the prices of credit default swaps and subordinated debt. By requiring large institutions to engage in these markets, regulators would be able to incorporate market-generated information to their risk assessments. Hence this alternative combines supervisory and market oversight, helping to generate
and harness the information markets are capable of producing. The job of the supervisors would be significantly easier if this could be done effectively.

However, as Caprio, Demirgüç-Kunt, and Kane (2008) emphasize, prices in credit default swap or subordinated debt markets can be a strong source of discipline only under two conditions: (1) market participants do not expect to be bailed out when trouble develops, and (2) investors have access to regular flows of high-quality information. This underlines the importance of establishing incentives that would lead both supervisory authorities and market forces to operate more effectively.

Caprio, Demirgüç-Kunt, and Kane argue that this crisis exemplifies not just the limits of market discipline, but the power of government-induced incentive distortions—and the limits of official supervision as commonly practiced. The failure of private parties to exercise sufficient due diligence was rooted in the failure of government supervisors to challenge decisions made by private accountants and credit-rating organizations. Authorities neglected their duty of examining and publicizing the implications that these decisions might have for safety-net loss exposure. By tolerating a decline in transparency, supervisors made it difficult to recognize and price the risk expansion, not only for themselves but also for the market participants.20

Hence, Caprio, Demirgüç-Kunt, and Kane propose reforms that improve the chain of incentives under which market discipline and official supervision operate, which include reforms for lenders, credit rating organizations, securitization, accounting, and government officials. Perhaps most important among these are their proposals for enhancing accountability of government officials through better crisis preparedness, greater use of market information to track risks and subsidies, publicizing estimates of safety-net subsidies, and deferred compensation schemes.

First, as already discussed above, crisis preparedness is important to avoid short-termism in crisis-management. Accountability would be greatly improved by requiring that regulators establish and regularly test a well-publicized benchmark plan for crisis resolution.

Second, regulators need to draw on market signals to overcome information problems and improve their ability to track risk in and out of crises. Requiring the largest banks to issue at regular intervals a series of credit default swaps or uninsured subordinated debt would provide such signals, since the holders of these instruments would apply the market discipline that pillar three of Basel II seeks to harness.21

Third, the safety net needs to be strengthened by making authorities more accountable for its cost. This requires the development of a system of fair-value accounting for intangible safety-net subsidies to establish political accountability for controlling them. Important institutions and their supervisors must be
required to model, estimate, and expose to outside review the value of this intangible source of income—both in individual institutions and in the aggregate.

Fourth, the decisionmaking horizons of government officials can be lengthened if employment contracts included a fund of deferred compensation that the heads of supervisory authorities would have to forfeit if a crisis occurred within a couple of years after leaving their office. Calomiris and Kahn (1996) show that such a system worked well in the 19th-century Suffolk banking system, where claims to deferred bonuses were paid only after losses were deducted.

While the discussion of how best to reform regulation and supervision of financial institutions is likely to continue, it is important to keep in mind that ultimately the goal of financial regulation and supervision is not to reduce financial institution risk-taking, but to manage the safety net so that private risk-taking is neither taxed nor subsidized. This goal implies that supervisors have a duty to see that risks can be fully understood and fairly priced by investors. No one should expect that, in a risky world, risk-neutral regulation and supervision can eliminate the risk of financial crises; what it can do is to reduce their frequency and cost.

Monetary Policy, Asset Prices and Macroprudential Regulation

Most observers agree that lax monetary policy in the United States in the early 2000s helped fuel the housing bubble, at least in its initial stages. In light of the devastating effects of its bursting, one major policy question looking forward is the proper role of monetary policy. Should central banks respond systematically only to inflation in goods prices, as they do at present, or should they also respond systematically to inflation in assets prices? To put it more bluntly, should monetary authorities attempt to "prick bubbles" through monetary tightening?

Not all bubbles are alike. Some create risks to the financial system, while others do not. Bubbles that threaten financial stability typically involve a feedback loop between asset prices and credit conditions: a credit expansion raises asset prices, which in turn encourages further lending and hence further asset price rises, and so on. When the bubble bursts, asset prices collapse and the loop goes in reverse, eroding the balance sheets of financial institutions, causing a credit crunch and a fall in economic activity. But not all bubbles have these features—for example the dot-com bubble of the late 1990s in the United States was not associated with a credit boom, and its crash did not weaken lenders' balance sheets to a significant extent. Hence the pursuit of financial stability poses a greater need for the monetary authority to react to some bubbles than to others.

Attempts by the authorities to deflate an asset price bubble—through monetary policy or other means—in the absence of obvious symptoms of inflationary or
financial distress face serious political-economy obstacles. Lenders and borrowers riding the bubble euphoria are likely to condemn such seemingly unwarranted courses of action, and politicians may oppose it under the view that, rather than a bubble, rising asset prices actually reflect the beneficial effects of improved policies.° Deflating a bubble amounts to suppressing an event, and it is impossible to prove ex post that the event would have occurred in the absence of policy action (Wyplosz 2009).

Political economy concerns aside, the monetary policy response to bubbles has been debated mainly in industrial countries in the context of inflation targeting regimes, under which monetary authorities react solely to inflation forecasts and the output gap (the “Taylor rule”). But the relevance of the question is much broader. It is of special significance to a growing number of emerging economies that have in recent years adopted inflation targets to guide monetary policy. More generally it matters to all countries whose monetary authorities are entrusted with inflation control and macroeconomic stability.

The conventional view of inflation targeting assigns no role to asset prices in the conduct of monetary policy, except to the extent that changes in asset prices signal changes in expected inflation (Bernanke and Gertler 2000). In this view, the authorities should deal with asset price bubbles only as their consequences, if any, arise in terms of the inflation objective—for example by supplying the needed liquidity in the event of a bubble burst. In other words, the authorities should not attempt to “prick” bubbles.

An alternative view advocates a more proactive response of monetary policy to asset prices. Of course, asset prices may rise or fall for many reasons, including changes in fundamentals—that is, reassessments of the anticipated future productivity of the assets—so in principle monetary policy should react to deviations of asset prices from their underlying fundamentals, that is, to asset bubbles, rather than to deviations from any particular target level (Cecchetti, Genberg, and Wadhwani 2003). Formally, while the monetary authorities’ objective function would continue to be defined only in terms of goods inflation, their reaction function should include not only inflation forecasts and the output gap, but also measures of asset price misalignment. In theory, adding more arguments to the monetary policy reaction function should allow the authorities to do no worse, and possibly to do better, than in the standard framework. But the approach remains untested, and several objections have been raised against its practical feasibility.

First, asset price bubbles are not easy to spot in real time—at least at their early stages when policy action might be most useful to stop them. Identifying a misalignment of asset prices requires a reliable assessment of their fundamentals. But available models of asset price fundamentals are inherently imperfect, and in addition some fundamentals—for example investors’ perceptions of risk and
future asset productivity—are not readily observable. A simpler alternative would be to use arbitrary rules of thumb, such as a threshold above which asset price increases would be deemed to involve bubbles. However, simple rules of thumb would likely lead to frequent identification errors, especially in narrow and illiquid asset markets (such as those of most emerging countries), characterized by high asset price volatility.25 And reacting to a misidentified bubble may be very costly—for example tightening in response to an asset price rise that in reality is driven by improving fundamentals will both hamper growth and interfere with the role of asset prices in allocating resources. Of course, one possible solution to this problem is to react only to bubbles once they become self-evident, but by then it may be too late for monetary policy to mitigate their effects. Indeed, if the authorities tighten when the bubble is already nearing collapse on its own, the contractionary effects of the tightening could compound, rather than mitigate, those of the bubble collapse. Yet while this view that bubbles are hard to spot ex ante is certainly correct, one could argue that other standard tasks of monetary policy, such as forecasting output and inflation over a multiyear horizon, are not less difficult.

Second, what asset prices should the monetary authority watch? Not all asset prices are synchronized, and at any one time bubbles may be present in just a few of the many assets available in the economy. Some observers suggest that the price of housing may be the best candidate for close monitoring, given that housing values have major wealth effects on spending—and hence are more relevant than other asset prices for inflation and the output gap—and that housing cycles of boom and bust are more frequent than equity market cycles.26 A broader view holds that the monetary authority should focus on the prices of assets held by highly leveraged financial intermediaries, given their key role in the boom-bust credit cycle and the propagation of financial turmoil in the current crisis (Adrian and Shin 2009).

Third, little is known about the timing and magnitude of the effects of monetary policy on asset prices, and hence its ability to prick bubbles. For example, some research suggests that very large interest rate hikes may be necessary to bring housing prices down to any noticeable extent—so large in fact as to result in huge output losses (Assenmacher-Wesche and Gerlach 2008). But other recent research indicates that monetary policy has a sizable effect on the acquisition of assets by leveraged intermediaries (Adrian and Shin 2009) and on bank lending standards (Maddaloni, Peydró, and Scopel 2008). The implication is that a timely monetary tightening in the boom might have been effective at containing the cyclical expansion of leverage, credit, and asset prices, and prevented the deterioration of lending standards, two key ingredients in the gestation of the current crisis.

Overall, the usefulness of monetary policy to prick bubbles remains controversial. One additional concern is that gearing monetary policy to deflate hard-to-identify
bubbles may detract from its transparency and predictability, especially in emerging markets that are still at the early stage of establishing the credibility of their inflation targeting regimes or, more generally, their commitment to price stability.

To approach the problem from a different angle, it is important to recall that monetary authorities in most countries face two different objectives: price stability and financial stability. With monetary policy as their only instrument, the authorities can find themselves in situations where the objective of price stability requires a policy change in one direction, while that of financial stability points in the opposite direction. Ideally a second instrument should be devoted to financial stability. The best option is a prudential regime capable of dampening financial cycles of boom and bust by preventing feedback loops between asset prices and credit supply. This is what has been termed “macroprudential” regulation. Its thrust is to complement regulators’ traditional focus on the risk management of the individual financial institution with a focus on the risk management of the financial system as a whole. Macroprudential regulation aims at dealing with increases in systemic vulnerabilities due to (i) periodic business downturns that affect all financial institutions; (ii) increases in the number of financial institutions that have become too large, too interlinked, and therefore too difficult to fail and unwind. The first is an age-old problem, which is exacerbated by the amplitude of the business cycle, as discussed above. The second has become increasingly more important as safety-net subsidies provided to large, interconnected firms have increased over time, giving them more incentives to become even larger and more interlinked.

While monetary authorities possess a variety of tools to pick up the pieces after a financial crash, they lack the regulatory instruments to contain the lending boom that usually precedes it. However, provisions, leverage ratios, loan-to-value ratios, and additional capital buffers can all be designed to be countercyclical, that is, to move inversely with the business cycle in order to make financial intermediaries hold more liquid assets in good times so that they can be run down in bad times (Goodhart 2008a, 2008b; Goodhart and Persaud 2008). The idea is to switch the basis of capital adequacy requirements from levels of risk-weighted assets to their rates of growth—hence requiring additional capital and liquidity when bank lending and asset prices are rising fast—and relaxing such requirements in the downturns. This can be seen as an alternative (or a complement) to monetary policies to prevent the growth of asset bubbles (and their busts). To date, however, this kind of instrument has seen little use, except for Spain’s countercyclical “dynamic provisioning,” as well as the introduction of time-varying, loan-to-value ratios in a few small economies.

Aside from practical questions—for example, over what periods applicable credit growth rates should be calculated—these proposals also raise other potential difficulties that require deeper consideration. As prudential requirements
are tightened in the upswing, they will encourage disintermediation to less-regulated entities (or countries), and this may weaken the effectiveness of the regulations. In addition, the cost of intermediation will rise in the boom, possibly constraining growth and financial innovation. Lastly, macroprudential regulation adds to the informational burden on the regulators and the complexity of their task. As with monetary policy, significant political will is required to enable the authorities to tighten regulation in the upswing. Although reliance on well-defined rules (rather than reliance on discretionary regulatory changes) and independence from government may be helpful in this regard, it is still questionable whether without appropriate incentive reforms this will be possible.

Finally, to deal with too large or too interconnected firms, reform proposals aim to increase supervisory scrutiny (potentially through a college of supervisors) or additional capital charges imposed on these institutions. However, proper identification and increased regulation of these institutions require credible estimates of the safety-net subsidies that are provided to them. Estimating and publicizing safety-net subsidies as advocated by Caprio, Demirgüç-Kunt, and Kane (2008), as discussed in the previous section, would be one step in this direction.

These and similar ideas underlie an active debate on macroprudential regulation that has already generated a number of reform proposals (Kashyap, Rajan, and Stein 2008; Acharya and Richardson 2009; Brunnermeier and others 2009). However, their specifics differ, and a consensus on the best way to go has yet to be achieved.

In the meantime, what can monetary policy do? An emerging view holds that, even if bubbles cannot be accurately identified, monetary policy can contribute to financial stability by becoming more "symmetric" over the financial cycle—that is, becoming more restrictive during a financial market boom, just like it almost invariably becomes accommodative at times of asset price crashes (Papademos 2009). This view is supported by theoretical models in which monetary policy reacts to credit growth or other indicators of the financial cycle to dampen boom-bust episodes (Bordo and Jeanne 2002a, 2002b; Christiano and others 2008). In light also of the recent empirical findings cited earlier, that monetary policy affects significantly the volume and the quality of the assets held by leveraged financial institutions, the implication is that there might be a role for balance sheet aggregates in the determination of monetary policy. But that role would be due to reasons of financial stability, rather than the classic reasons of price stability behind the once-popular targeting of monetary aggregates. (Adrian and Shin 2009) However, at this stage little is known about the complexities of implementing such policy or about its likely effects, for the obvious reason that it has never been applied. These questions are currently the subject of active research.
Capital Controls

The financial turmoil of the current crisis propagated rapidly to emerging markets around the world, which suffered, to varying degrees, sharp increases in external borrowing premiums and abrupt declines of capital inflows, as well as large falls in their currencies in the face of a flight to safety by international investors. Thus, even though the crisis originated in the North, the financial symptoms in emerging markets have been similar—albeit in general less acute—to those of the homegrown crises of the 1990s. Propagation of this financial shock—which adds to the real shock accruing through the global slowdown—has been facilitated by the deepening of direct and indirect financial links across economies brought about by international financial integration.\textsuperscript{28}

As in previous episodes of global turmoil, the sudden stop in capital flows has put emerging markets under stress and has hit especially hard countries that were running large current account deficits, had developed large currency and maturity mismatches, or both—as was the case in several Eastern European economies. In this context, some observers have advocated controls on capital outflows to stem the creditor run and relieve the pressure on foreign reserves and exchange rates.\textsuperscript{29} Indeed, rigorous exchange controls were a key feature of Iceland’s 2008 emergency package (supported by the IMF), amid the collapse of its currency and banking system. Among emerging markets, only a few have resorted to controls on outflows so far. Ukraine, Russia, and Belarus introduced some restrictions on outflows, while Ecuador imposed an exit tax.\textsuperscript{30}

Controls on capital outflows, which date back to Germany in the 1930s, have a long tradition as a crisis containment tool. They seek to prevent the disorderly retreat of investors at times of turmoil\textsuperscript{31} and thereby protect the stock of reserves of the Central Bank, relieve pressure on the exchange rate, and provide some room for monetary policy—which is severely constrained when capital mobility is high and policymakers also try to pursue exchange rate targets.

There have been numerous episodes of outflow controls in crisis times—for example Spain, in the context of the 1992 ERM crisis; Venezuela, at the time of the banking crisis of 1994; Malaysia and Thailand, on occasion of the 1997–98 East Asian and Russian crises; and Argentina, at the time of collapse of the Convertibility Plan in 2001.

These controls took a wide variety of forms. They frequently targeted “speculative” transactions and exempted current account transactions, flows related to foreign direct investment, or both. They ranged from unremunerated deposit requirements on banks’ foreign asset holdings (Spain) to comprehensive prohibition of outflows (Venezuela and Argentina). But how effective were they? The question has been the focus of a multitude of studies: see for example the overviews by Ariyoshi and others (2000) and Magud, Reinhart, and Rogoff (2007).
The case of Malaysia is perhaps the one that has attracted the most attention. Observers agree that the controls succeeded in limiting outflows and segmenting onshore and offshore markets, providing some breathing space for monetary and financial policy. There is much less agreement regarding the effective contribution of the controls for easing the cost of the crisis, as some observers contend that the worst of the global turmoil was already over at the time the controls were instituted and that Malaysia's subsequent recovery path was no better than that of countries that did not introduce controls, while others argue that the controls did allow a speedier recovery than would have otherwise occurred given the higher vulnerability of the Malaysian economy relative to that of other East Asian countries.32

Analyses of other episodes of controls on outflows yield mixed conclusions. In Spain and Thailand, the controls helped contain outflows and relieve pressure on the exchange rate only temporarily, and eventually both countries had to abandon their pegs—Spain through an ERM realignment, and Thailand by floating the exchange rate. In Venezuela, the controls did not fully succeed in containing outflows either, but there is evidence that they helped to ease pressure on the exchange rate and gain some degree of monetary policy autonomy which, through lower interest rates, reduced the immediate fiscal cost of the country's banking crisis.

A concrete way to assess the action of controls is by examining the differential between the prices of identical assets traded in onshore and offshore markets. Among such assets are the American Depositary Receipts (ADRs) issued abroad by an increasing number of large emerging market firms. The onshore–offshore price differentials on ADRs have been recently examined by Levy-Yeyati, Schmukler, and van Horen (2009) for several episodes of inflow and outflow controls. The finding is that controls on outflows generate a positive differential between onshore and offshore prices as investors buy equity at home and sell it abroad in order to transfer their wealth out of the country (inflow controls have the opposite effect).33 This suggests that even if capital controls fail to bring outflows to a halt, they usually do succeed in temporarily segmenting asset markets, by creating "no-arbitrage" bands that effectively decouple rates of return at home from those prevailing abroad.

However, there is also evidence that this market segmentation weakens with the passage of time (Kaminsky and Schmukler 2001). The reason is that capital controls develop leakages as investors find arbitrage strategies and loopholes to circumvent them.34 The search for loopholes at times of crisis is driven by investors' anticipations of big return differentials between domestic and foreign assets, especially in the event of a large exchange rate depreciation. These anticipated differentials often dwarf the increase in the cost of taking capital out imposed by the controls. Evasion mechanisms for controls on outflows range from the
traditional overinvoicing of imports and underinvoicing of exports to misreporting of capital account transactions in order to make them fit under those categories of flows left unrestricted by the authorities. Deeper international financial integration, as well as a higher degree of development of domestic financial markets, make the enforcement of controls harder, as they broaden the menu of evasion strategies available to sophisticated (and typically large) investors. As a result, effective enforcement of controls typically requires continuous monitoring and adaptation efforts by the authorities. In this regard, the international experience shows that comprehensive controls are easier to enforce because they are not vulnerable to evasion through those outflows left unrestricted. However, comprehensive controls also deter "nonspeculative" transactions, such as those related to foreign direct investment, as was seen in the Malaysia episode.

Controls on outflows also entail costs in terms of investors' confidence. Because they are usually imposed ex post, as an emergency measure, they typically lead to violation of explicit or implicit contracts. As a result they may raise the perceived riskiness of inward investment and reduce access to foreign capital, and this adverse effect may last well after the removal of the controls on outflows, as investors considering future capital inflows factor into their risk-return assessment an increased perception of the likelihood that they may be unable to take their capital out when needed, at least without cost. While this credibility effect is hard to quantify, there are strong indications that it was at work in the experience of Malaysia, in which the evidence suggests that the controls on outflows subsequently had a deterrent effect on capital inflows, including long-term ones (Goh 2005).

Lastly, capital controls create rents whose allocation is at the discretion of public officials and which therefore opens the door to cronyism and corruption around exceptions and loopholes. In the Malaysia episode, for example, there is evidence that politically connected firms did much better under the controls than unconnected firms.

To summarize, the evidence indicates that controls on capital outflows are effective only temporarily and are more vulnerable to evasion when they are selective rather than comprehensive. They also involve costs in terms of investor confidence and augmented potential for rent-seeking. All this, however, does not mean that controls on outflows should never be used under any circumstances. In fact, when a run on domestic assets gets under way, the authorities may have no option but to impose controls to prevent the collapse of the financial system, a free fall of the currency, or both. The lesson instead is that controls should only be used as a last resort, and only for brief periods to give the authorities a respite from corrective measures. But the more frequent the resort to controls, and the longer they are held in place, the more likely they are to become a substitute for the actual measures and lead eventually to an even bigger crash.
From a broader perspective, controls on capital outflows are just a rudimentary tool of last resort to cope with the vulnerabilities associated with international financial integration. While integration offers countries new opportunities in terms of access to foreign financing and enhanced risk diversification, it also increases countries' vulnerability to external shocks—as the current crisis has clearly shown. How to manage this vulnerability remains a hotly debated issue.37

Conceptually, the fragilities associated with capital account openness arise from two main sources: currency mismatches and maturity mismatches. For developing countries, currency mismatches are due to their inability to borrow externally in domestic currency (the "original sin" of Eichengreen and Hausmann 1999), which forces them to bear the exchange risk associated with foreign-currency borrowing.

In turn, maturity mismatches can leave borrowing countries vulnerable to creditor runs in a way that is analogous to bank runs. These runs were at the core of the East Asian crisis and have been a recurrent factor in other emerging market crises (Broner, Lorenzoni and Schmukler 2007). They played also a key role in the propagation and amplification of the subprime crisis in the United States (Brunnermeier 2009). Maturity mismatches may reflect the reluctance of lenders to enter into long-term contracts when moral hazard and asymmetric information are pervasive, or when the macrofinancial framework is deemed fragile. The appeal to public and private borrowers is that in such conditions short-term borrowing is cheaper than long-term borrowing.38 However, private external borrowing decisions fail to take into account their social costs—that is their contribution to raising the aggregate risk of a creditor run or a currency collapse (Caballero and Krishnamurty 2003; Korinek 2009).

In fact, major currency and maturity mismatches did arise in a number of countries in the run-up to the global crisis. For example, in some Eastern European countries households actively engaged in the "reverse carry trade" by borrowing in low-interest rate currencies, oblivious to the exchange risk involved; hence foreign-currency financing of residential mortgages became ubiquitous. Worse yet, corporations often borrowed short term in foreign currency to finance long-term domestic-currency assets. Banks lent in foreign currency to borrowers lacking foreign currency assets or income, effectively replacing currency risk with credit risk in their balance sheets (Buiter 2009). These mismatches have contributed to the magnification of the adverse impact of the financial turbulence trigged off by the crisis.

The lesson, however, is not that external borrowing should be restricted. In the case of currency risk, the key is to achieve an efficient distribution of currency risk within the economy by ensuring, through regulatory means, that it is appropriately priced and therefore borne by those best able to do so (for example agents holding foreign currency assets, including exporters). For instance, regulations
should discourage banks from lending foreign currency to borrowers without foreign currency assets or income. Likewise, adequate prudential regulation of large financial and nonfinancial borrowers can help limit maturity mismatches. Alternatively, the government could contain aggregate exposure to currency and maturity mismatches by accumulating short-term foreign assets to offset, at least in part, private sector actions—a strategy adopted by a number of emerging markets after the East Asia crisis.

In the longer term, institutional changes supporting credible nominal stability should help open the door to domestic-currency borrowing, even if only marginally at first—as seen in countries like Chile, Mexico, Poland, and South Africa—thereby helping to mitigate currency mismatches. Credible macrofinancial stability should also allow enhanced access to borrowing at longer maturities.

Controls on capital inflows are often advocated as a potential alternative (or a complement) to prudential regulatory measures for preventing the build-up of currency and time mismatches. Depending on the specifics, controls on inflows could help deter overborrowing—limiting exchange rate appreciation, asset price bubbles, and excessive risk-taking at times of large inflows—and/or alter the composition of flows against short-term inflows (“hot money”) susceptible to rapid reversal.

Since the early 1990s, recourse to controls on capital inflows has become frequent as a number of emerging countries have tried to navigate global inflow booms. A partial list includes Indonesia (where controls were introduced in 1991), Malaysia (1994), Thailand (1995, and again in 2006), Brazil (1994), Chile (1991), Colombia (1993, and again since 2004), Mexico (1990), and the Czech Republic (1992). As in the case of outflows, controls on inflows included a variety of instruments—from explicit taxes on foreign borrowing by local firms and fixed-income investments by foreigners (Brazil) to unremunerated reserve and minimum-stay requirements for foreign borrowing by domestic firms (Chile and Colombia, as well as Thailand over 2006–08)—and limits on banks’ external borrowing (Indonesia, Malaysia, Thailand, the Czech Republic, and Mexico). Several of these countries matched the introduction of controls on inflows with a removal of barriers to outflows and with various reforms in the prudential framework of the domestic financial system.

The case of Chile in the 1990s has been closely scrutinized by a host of empirical studies. The controls were based on a mandatory unremunerated one-year deposit (or *encaje*) at the Central Bank equal to a given fraction (initially set at 20 percent) of eligible inflows. The two distinguishing features of the scheme were (i) its implicit cost was higher for short-term inflows than for long-term ones, and (ii) the cost was determined by the prevailing level of world interest rates. Initially the regime was applied only to foreign loans (except trade credit). As investors succeeded in finding a variety of loopholes, it was gradually extended to
encompass nondebt creating flows as well—even including foreign direct inves-
tments deemed "speculative." The scheme was eventually eliminated as inflows
evaporated at the time of the 1998 Russian crisis. 39

In spite of the often-heard view (especially outside Chile) that the inflow controls
were highly successful, their effectiveness remains disputed. On the whole, the large
literature concerned with the Chilean experience suggests that (i) the controls were
successful at giving the Central Bank some degree of monetary autonomy, allowing
it to keep domestic interest rates above international levels—although by most esti-
mates this effect was quantitatively small and temporary; (ii) the composition of
inflows was somewhat altered in favor of longer-term flows—although here the evi-
dence is weak; (iii) no clear result emerges regarding the impact on total capital
inflows; (iv) there was no discernible effect on exchange rates.

Evidence from other episodes is mixed. Colombia’s unremunerated reserve
requirement, which was in effect over 1993–2000, and then again in 2007, was
designed along the same lines as Chile’s. Moreover, during 2004–06, as well as
in 2007, Colombia also imposed restrictions on short-term portfolio investment
(initially including its outright prohibition). 40 But there is little evidence that
these measures made any difference for the volume of inflows, the share of short-
term flows in the total, or the level of the exchange rate. In contrast, there is
some indication that short-term inflows were reduced in the episodes of Malaysia
and Thailand in the 1990s. In Brazil the controls were seemingly ineffective in all
dimensions. Thailand’s recent imposition of unremunerated reserve requirements
in 2006 was followed by a shift of portfolio inflows away from debt instruments
and toward equity, and a substantial differential between offshore and onshore
interest rates. 41

As with controls on outflows, these episodes show that controls on inflows
quickly develop leakages. The most common evasion mechanism was the mis-
statement of the purpose of the inflow; see Carvalho and Garcia (2006) for the
case of Brazil and Nadal-de-Simone and Sorsa (1999) for Chile. The result was a
weakening of the controls over time—especially rapid in the case of Brazil—in
spite of the authorities’ constant efforts to close loopholes and deter unwanted
flows.

Controls on capital inflows also entail other costs. Persistent barriers to capital
inflows may deter the development of local financial markets, which in turn may
hamper efficiency and growth. 42 And they also raise domestic financing costs by
allowing local interest rates to remain above international levels. Microeconomic
studies have found large adverse effects of Chile’s higher domestic interest rates
on the availability and cost of firms’ financing. 43 Moreover, because larger firms
could better afford the cost of evasion strategies, or had direct access to foreign
financing, the cost of the controls—in the form of a higher cost of borrowing—
was disproportionately borne by small and medium-sized firms.
Finally, what about the ability of controls on capital inflows to prevent volatility and crises, which was the main rationale for their use? Overall, there is not much evidence that they were of great help in this regard, although identifying the counterfactual is admittedly hard. Many observers have noted that the encaje did not prevent Chile from suffering a major sudden stop on occasion of the Russia crisis in 1998, although the scheme may have helped Chile mitigate the “normal” ups and downs of capital inflows in the 1990s (Edwards 1999). In retrospect perhaps this should not be surprising. At times of acute financial turmoil, the run for the exit is not limited to the unwinding of short-term domestic asset positions—whose build-up the encaje and similar mechanisms try to deter—but includes also that of longer-term ones, and involves domestic and international investors alike. The only deterrent to investor exit then is the possibility that the entry cost would have to be incurred again in the future, should investors decide to rebuild their positions. But in past crisis episodes most countries have in fact dismantled their inflow controls, so not even this deterrent remains. This puts into perspective the capacity of inflow controls to deliver stability in times of extreme financial turmoil such as is the case at present.

Conclusions

The intensity and the breadth of the on-going financial crisis have surprised nearly everyone. Perhaps, more importantly, the policy responses to the crisis have led to considerable confusion and shaken the confidence of the development community in the wisdom of financial and macroeconomic policies that underpin Western capitalist systems.

We have drawn on a large body of analytical research, econometric evidence, and country experience to argue that the “sacred cows” of financial and macro-policies are still very much alive. For the most part, the confusion arises from not being able to recognize incentive conflicts and trade-offs inherent in short-term and long-term responses to a systemic crisis. Policies employed to contain a crisis—often in haste to re-establish confidence and with disregard of long-term costs—should not be interpreted as permanent deviations from well-established policy positions. The fact that governments may end up providing blanket guarantees or owning large stakes in the financial sector in an effort to contain and deal with the crisis does not negate the fact that generous guarantees over the long term are likely to backfire or that government officials make poor bankers.

Financial crises often do expose weaknesses in the underlying incentive frameworks and the regulation and supervision systems that are supposed to reinforce them. But finance is risky business and it is naive to think that regulation and supervision can, or should, completely eliminate the risk of crises, although they
can make crises less frequent and less costly. Neither monetary policy nor capital controls can substitute for well-designed prudential regulation.

Despite their inherent fragility, financial systems underpin economic development. The challenge of financial sector policies is to align private incentives with public interest without taxing or subsidizing private risk-taking. Public ownership or too aggressive regulation would simply hamper financial development and growth. But striking this balance is becoming increasingly complex in an ever more integrated and globalized financial system.

Notes

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1. Honohan and Laeven (2005) bring together research and first-hand crisis experience to catalog lessons on a variety of issues that regularly arise in crises.
2. Hungary and Jordan are such examples.
3. See for example Switzerland, the Czech Republic, Poland, and Slovakia.
4. See 'Design of Prudential Regulations' below for further discussion of these instruments and markets.
6. Argentina's reduced deposit mobilization after its 2001 deposit freeze is an example.
8. Indonesia, the Philippines, South Korea, Mexico, and Chile are examples. See Caprio and Klingebiel (1996) for a complete list.
9. Whether or not the control of the bank completely passes into public hands during the resolution stage is secondary to the fact that after the resolution the bank should be well-capitalized. Problems often emerge because governments are unable to do the financial restructuring properly; and banks that continue to operate with insufficient capital have every incentive to resume reckless risk-taking.
10. See World Bank (2001) for a discussion.
11. Similar trade-offs are considered in liberalizing financial systems, since premature liberalization without adequate attention to developing institutions increases financial fragility. See Demirgüç-Kunt and Detragiache (1998).
12. Notice there was also significant private equity injected into financial institutions in the latest crisis. The figures reached US$500 billion by September, 2008, which is larger than in any other crisis in history.
13. It is difficult to evaluate the success of programs such as the RFC, but in this case it is credited with having contributed to a recovery of confidence and output (until monetary tightening reversed both in 1937). The government recovered its initial capital and did not bail out nonviable banks. See Mason (2000) for an analysis.
14. The Basel committee itself notes that Basel II arose in response to the growth of securitization, giving the impression that this growth was an exogenous development rather than at least in part a response to Basel I and its “loan-by-loan” approach to assessing a firm’s overall risk exposure.


16. See Caprio, Demirgüç-Kunt, and Kane (2008) and statements of the Shadow Financial Regulatory Committee, which can be found on the American Enterprise Institute (AEI) website.

17. For a discussion of tensions between the goals of expanding access and maintaining stability, see World Bank (2007).

18. These include proposals by Krugman (2008), the Institute for International Finance, the Counterparty Risk Management Policy Group (2008), and the Financial Stability Forum. Goodhart (2008a) and Goodhart and Persaud (2008) recommend authorities set countercyclical capital requirements, introducing a leverage ratio that would move inversely to the business cycle.


20. Investigating the impact of compliance with Basel Core Principles on bank soundness, Demirgüç-Kunt, Detragiache, and Tressel (2008) show that compliance with information provision and transparency is the most robustly associated with the financial strength of institutions.

21. Subordinated debt has advantages in terms of improving market discipline since subordinated debt holders have incentives to negotiate covenants that would protect their interests. However, credit default swaps (CDS) have advantages in tracking risk since, unlike subordinated debt (which are illiquid instruments), CDS are continuously traded, providing useful signals on a timely basis.

22. Indeed, bubbles can be welfare-enhancing to the extent that they provide stores of value that would otherwise not be available to savers. The best example is that of fiat money in Samuelson’s overlapping-generations model; see also Ventura (2004) for a recent open-economy example.


24. This view is also stated by Mishkin (2008).

25. How fast should asset prices rise for us to conclude safely that a bubble is at work? Too low a threshold would lead to the (incorrect) detection of too many bubbles. Even modest changes in key fundamentals—such as investors discount rates or their anticipations of the rate of growth of future dividends—can lead to large changes in the prices of long-lived assets over short periods. In turn, too high a threshold (say 20 or 40 percent per year) could fail to detect many bubbles altogether. For example during the recent U.S. housing bubble real-estate price increases remained consistently below 15 percent per annum, according to the Case-Shiller U.S. national home price index (see http://www.standardandpoors.com/home/en/us).

26. The role of housing prices is stressed by Bordo and Jeanne (2002a, 2002b) and Cecchetti, Genberg, and Wadhwani (2003).


28. These links have been documented by extensive theoretical and empirical research. See for example Calvo (1999), Brouer, Gelos, and Reinhardt (2006), and Didier, Schmukler, and Mauro (2008).


30. Also, Indonesia and China tightened reporting requirements. Argentina has also recently sought to prevent sales of American Depositary Receipts abroad by domestic residents.

31. In this sense, controls on outflows are similar in spirit to a bank holiday or a suspension of stock market trading.


33. Notice that these transactions do not entail a net capital outflow or a reserve loss, as the gross outflow implied by the nonrepatriation of the proceeds of the asset sale abroad is matched by
the gross inflow implied by its purchase with foreign funds, without any net effect on the foreign reserve stock; see Levy-Yeyati, Schmukler, and van Horen (2004). However, this kind of international asset migration may have consequences for the tax collection capacity of the local authorities, as domestic residents effectively shift assets out of the domestic jurisdiction.

34. This applies also to the case of inflow controls; see Carvalho and Garcia (2006) for a detailed account of evasion strategies employed by investors in Brazil.

35. As evasion strategies often involve setup costs (as well as the possibility of penalties), they are more easily available to large, wealthy and/or well-connected investors. In fact, evidence from several crisis episodes in Latin America shows that large investors typically liquidate domestic assets ahead of the full-blown crisis and the imposition of controls, so that the burden of controls falls mainly on small investors—while flight from domestic assets by large investors helps trigger the eventual crash. This is one of the mechanisms identified by Halac and Schmukler (2004) through which the cost of financial crises is disproportionately borne by small investors.


37. The perils of financial integration in a world of imperfect markets have been stressed by many distinguished observers, going as far back as Tobin (1978), and including Harberger (1980), Diaz-Alejandro (1985), Bhugwati (1998), Cooper (1998), and Stiglitz (2002).

38. Broner, Lorenzoni and Schmukler (2007) show that this maturity premium is quite substantial in the case of emerging markets.

39. Nadal-de-Simone and Sorsa (1999) provide a detailed description of Chile’s controls on inflows.

40. Concha, Galindo, and Quevedo (2008) provide a detailed analysis of Colombia’s experience with controls on capital inflows.

41. McCauley (2008) documents Thailand’s recent experience, as well as those of other Asian countries.

42. See for example Bekaert, Harvey and Lundblad (2003).

References


The intensity of the crisis in financial markets has surprised nearly everyone. The authors search out the root causes of the crisis, distinguishing them from scapegoating explanations that have been used in policy circles to divert attention from the underlying breakdown of incentives. Incentive conflicts explain how securitization went wrong, why credit ratings proved so inaccurate, and why it is superficial to blame the crisis on mark-to-market accounting, an unexpected loss of liquidity, trends in globalization, and deregulation in financial markets. The authors' analysis finds disturbing implications of the crisis for Basel II and its implementation. They conclude by drawing out lessons for developing countries and identifying reforms that would improve incentives by increasing transparency and accountability in government and industry alike. JEL codes: G21, G28, G32

Since August, 2007, after a long period of relative quiet in world markets, a spreading financial crisis has nearly monopolized the flow of economic news. Beginning during a period of strong world macroeconomic growth and low interest rates, the crisis appears to have surprised financiers and regulators alike. The turbulence was triggered by a sudden and widespread loss of confidence in securitization and financial engineering and by the manifest failure of respected statistical models for assessing and pricing credit risk.

Most astonishingly, these now-doubtful techniques had previously been hailed as the cornerstones of modern risk management. The turbulence proved greatest in countries whose supervision of credit risk had been thought to be the best in
the world. Indeed, the regulatory standards and protocols of these countries were in the process of being emulated worldwide.

As the crisis unfolded, the world witnessed a series of unprecedented events, including a previously unthinkable rate of default on AAA instruments; the first run on a U.K. bank in 150 years; and an explicit extension of the U.S. safety net to cover a major insurance company, the entire investment banking industry, and two giant government-sponsored housing-finance enterprises (Fannie Mae and Freddie Mac). These events were followed by the demise of a number of commercial and investment banks and a sharp worldwide plunge in equity stock prices that was especially pronounced in the financial sector.

Reverberations quickly spread beyond the two financial-center countries to other industrial countries including Australia, Ireland, Iceland, Germany, and many other countries, first by financial channels and then by the collapse of world trade. By April, 2009 the IMF was estimating total losses at over $4 trillion, about two-thirds of which would redound to banks around the world (IMF 2009, p. xi). Inquiring minds yearn to know how this crisis could have occurred in the 21st century, and especially how it could have originated in the United States, home to arguably the most sophisticated financial system in the world.

Increases in leverage and risk taking, which were key factors in the crisis, were not limited to the aforementioned countries but seen also, in particular, in the Baltics and other Eastern European countries. Developing countries had been closely emulating the approaches to financial sector regulation taken in the high-income countries, as seen in the decision by many of the former to adopt the Revised Capital Framework, or Basel II. Although most emerging markets had not yet adopted significant use of securitization in their domestic financial systems, they were well on the way to greater reliance on ratings organizations. Additionally, the failures in the incentive and information environment that were the hallmark of this crisis are relevant for developing countries, as seen in the Mexican and East Asian crises of the 1990s. Both rich and poor countries’ financial systems share a vulnerability to asset bubbles, and a key message from the current crisis is that all countries need to focus on the vigilance of their regulatory authorities.

Beyond dramatic macroeffects, already seen in collapsing trade volumes and output growth, this crisis will have two important channels through which it will influence developing countries. First, influence will be felt through the upcoming reforms of the architecture of financial regulation. While we cannot predict future policies, how this reform should proceed is the focal issue of our analysis. Second, developing countries will be affected long into the future by the lessons that they draw from this crisis, regardless of the regulatory changes made in the high-income countries. We regard it as critical that these lessons can and should be implemented in low- and middle-income countries. Complex methods for
regulating risk-taking have failed miserably in this crisis, so it is time for simpler yet effective approaches to regulation and supervision.

Promptly uncovering the true roots of this crisis is important because false explanations are quick to gain a toehold. As a crisis matures and then begins to recede policymakers and pundits often latch onto simplistic theories of what happened, why it happened, and what should be done to see that similar events do not happen again. Sadly, the story that official theories are beginning to tell and the policy solutions that these flawed theories recommend tend to be dictated not by the economics of crisis generation, but by self-interested jockeying by groups and individuals that are anxious either to shift blame away from themselves or to see that national safety nets remain an important source of subsidies to large and complex institutions.

Our study seeks to make it clear that the principal source of financial instability is not to be found in the aberrant behavior of a few greedy individuals or in a sudden weakening of important institutions of a particular country at a particular time. Rather systemic financial fragility is marked by an undermining of the effectiveness of financial regulation and supervision in every country in the world, often involving contradictory political and bureaucratic incentives. Supervisory agencies overlook those occasions when financial institutions and their customers overleverage themselves in creative ways; they also close their eyes to the unbudgeted costs of the loss exposures that excess leverage passes onto financial safety nets until it is too late for anyone to control the damage that results.

To understand the sources of instability we need to remember that regulation and supervision must be viewed as an endless game of action and response (Kane 1977). In this game the regulated side is able to move more often and more quickly than the regulatory side can. As outsiders, regulators are at a disadvantage in monitoring and enforcing financial discipline, so they inevitably find themselves trying to catch up with their regulatees. Every move they make generates a series of new and creative moves by financial institutions who seek to minimize the burdens regulations ultimately place on them. The profit-making orientation of financial institutions also ensures that their moves are not only swifter, but also more complex and harder to anticipate than those of regulators. This dynamic perspective helps us to ask and answer a series of central questions about the origins of the latest crisis:

- Where did modern financial engineering, securitization, and risk management go wrong?
- Why did rating organizations not uncover the dangers, and who should bear responsibility for over-rating securitized debt?
- Can mark-to-market accounting cause a crisis or is it merely a messenger?
• What did financial globalization contribute to the crisis, and should links among national markets be restrained in some way?
• Has Basel II failed already, or would its wider implementation have stopped the spread of the current turmoil?
• What are the lessons from this and past crises for developing countries?

Finally mention should be made of two important issues that are beyond the scope of this paper. The first is the role of monetary policy in the run-up to, and the implosion of, bubbles, and the associated policy issues. For an analysis of this we refer the reader to Roubini (2005), Posen (2006), Taylor (2009), and Demirgüç-Kunt and Serven (2010). The second issue is the authorities’ crisis resolution policies. These are not covered here, since it would be premature to try to summarize their triumphs and mistakes while they are still shaping and reshaping their response to the crisis.

How Did Securitization Go Wrong?

The first reaction to the breakdown of structured securitization was disbelief: How could something as universally applauded as financial engineering go so wrong? Securitization was supposed to identify risks accurately and parcel them out to parties who could easily bear the risks they assumed. But everyone now realizes that promoters of modern techniques of risk management promised a great deal more than they could ultimately deliver.

For centuries, loans were the most illiquid parts of a bank’s balance sheet. Loan sales were limited by fears rooted in asymmetric information and adverse selection. Unless the sales contract specifically protected the buyer against the sellers’ informational advantage, the original lender would be tempted to sell off its worst loans (its so-called “lemons”) and hold back its solid loans for itself. These same issues made it hard for a buyer to resell loans when funds were needed.

Securitization provided an indirect way to sell loans, one that could offer buyers a number of useful safeguards. It also made it easy for a buyer to reverse its position later. Concerns about the quality of the loans chosen to back claims were muted when the original lender retained a “first-loss” position and also when the securities were highly collateralized.

In the United States, securitization took off in the 1970s. Its rapid development was greatly assisted by guarantees provided to investors by the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac). These government-sponsored enterprises (GSEs) regularized market practices by standing ready to buy and securitize mortgages that conformed to the particular standards that they set (Gorton and Pennachi 1995).
Subsequently, private securitizers developed protocols for trading claims to cash flows from other types of standardizable loans. The largest markets cover mortgages that were too big for the GSEs to purchase (so-called "jumbos"), credit-card debt, student loans, and automobile loans.

The 1988 Basel Accord (Basel I) also helped to generate a supply of loans that could be securitized and resecuritized. The accord tied two layers of bank capital requirements to an arbitrarily risk-weighted sum of their assets. The arbitrariness of the weights gave banks an incentive to move assets into off-balance-sheet securitization vehicles because capital charges on credit lines with which sponsors supported these vehicles were lower than the charges levied against on-balance-sheet positions. Basel II, which was just being implemented as the crisis was unfolding, further encouraged the holding of highly rated instruments and a reliance on risk models that turned out to underestimate the fragility of banks' portfolios.

By turning the cash flows from a pool of illiquid underlying assets (such as mortgages) into tradable bonds, securitization created liquidity—and that liquidity promised to make the financial system better diversified and more resilient. Instead of bankers having to hold onto and support every loan they originated until it matured or defaulted, securitization allowed risks to be stripped from the loans and disbursed beyond the traditional geographical areas in which a particular lender had been operating to investors in any country of the world. The gain from this innovation was the reduced cost of mortgages and more affordable home ownership for a range of marginally less-creditworthy individuals.

Securitization might not greatly degrade credit quality, as long as quality is transparent and well priced to all parties along the securitization chain. Breakdowns in assessing and pricing mortgage risk played an important role in the seizing up of asset-backed markets in 2007. While securitization is simple enough, the slicing of cash flows from various mortgages and other instruments into tranches, and the pressure for high ratings over time, led securitizers to fashion very complicated structures of cash-flow disbursement. The relation of particular tranches to the underlying asset pool was often very opaque. This made tranched claims difficult to value and susceptible to sudden changes in risk perception. Large banks could sell almost any pool of loans, securities, or revenues into the securitization process. Buyers would slice the claims they used into a series of at least three subordinated tranches: senior (AAA), mezzanine (BBB), and an unrated residual or equity tranche. In the event of defaults on individual loans, the equity tranche would absorb losses until the equity was used up. After that, the BBB tranche would absorb further losses until it too was exhausted. Subordinated tranching of risk does not mean that the loans in the securitized pool were divided into bands based on the credit risk of particular loans. Rather, senior tranches had the first claim on whatever cash flow the whole asset pool might generate. Buying a senior tranche offered protection against losses by
assigning them—in a probabilistic sense—to the junior tranches. Investment-grade credit ratings by credit rating organizations (CROs) awarded to the senior tranches suggested they were safe even when the underlying collateral was all subprime.3

The root problem with securitization—as with loan sales—is that outsourcing the funding side of an originator's balance sheet undermines its incentives to monitor the quality of the loans it originates. Troubled loans become the property and problems of someone further down the transaction chain. As the demand for highly rated tranches intensified and securitization became more complicated and less transparent, underwriting incentives weakened because securitizers and CROs performed little actual due diligence. Low interest rates and increasing housing prices encouraged an overly friendly regulatory environment both for highly leveraged mortgages and for securitization structures based on them.

Because securitization caused more subprime mortgages to be written, it expanded access to home ownership substantially.4 Unfortunately, federal regulators and Congress were cheerleaders in this process, even though higher volumes went hand-in-hand with lower standards and severe mispricing of risk.5 Dell'Ariccia, Igan, and Laeven (2008) show that standards weakened the most for borrowers whose risks were highest. Increases in the volume of loan applications by subprime borrowers were associated with an increased rate of approval and lower loan quality.6 In contrast, for borrowers classified as prime, increased applications produced more rejections.

How can one explain the growth of securitization? Demand was high both because interest rates on the safest securities were at or near record low levels and because of the capital relief afforded to banks for holding highly rated instruments, as well as the regulatory requirements on other intermediaries to hold the same. The Securities and Exchange Commission (SEC)'s sanctioning of certain ratings agencies (see below) no doubt gave investors some comfort. On the supply side, in addition to the quest to expand home ownership, risk-shifting created arbitrage profits for institutions able to service this demand. Securitization was simply the latest innovation through which financial institutions could simultaneously collect fees from investors and arbitrage loopholes in bank regulation and supervision. By placing important tranches of risky loans through and with foreign and nonbank firms, large commercial and investment banks layered the institutional character, and broadened the geographic span, of their funding arrangements. Moreover, they did this in ways that made these institutions ever more complicated, ever more interlinked, and therefore ever more difficult to fail and unwind in the event of a crisis. All of this increased their potential claims to intangible safety-net subsidies. Investors in complex claims on securitized pools of loans tended not to rely on either the lender's or their own due diligence and until well into 2007 many investors deemed it reasonable to allow credit rating
organizations to assess the risks for them. With supervisors closing their eyes to
the fraying of contractual incentives for lenders and credit raters to fulfill their
duties, few investors saw any reason to doubt that they were purchasing well-
rated and well-priced securities. Investors' mistaken belief that their growing
demand for highly rated investments was being properly serviced allowed the
demand side of the market to expand steadily.

Outsized commissions and fees earned on securitizations assured a steadily
growing deal supply. Compensation systems in commercial and investment
banking paid large bonuses tied to immediate profits and required no payback if
losses occurred in subsequent years. Even when compensation took the form of
stock options, blackout periods before such options could be exercised were too
short to align employee incentives with the long-term interest of the firm.

The development of securitization in emerging markets has not flourished at
the same rate, mostly due to underdeveloped capital markets. Securitization may
be beneficial for them, however, if it is kept simple and well-regulated. A prudent
framework of securitization should include two key features. First, leverage should
be effectively limited by capital requirements by requiring loans to remain on a
bank's balance sheet. Second, loan origination should be straightforward and
fully transparent. 7

Why Were Credit Ratings so Inaccurate?

While risk-management mistakes, low interest rates, and some kind of asset-price
bubbles are features of most crises, this crisis may be remembered as one in
which long-successful systems for using debt ratings to control institutional risk-
taking failed massively.

Although blame must be apportioned across the entire chain of securitization
activity, U.S. CROs come in for special criticism because investors have seen an
embarrassingly large number of downgrades and defaults for highly rated securi-
ties. In helping potential counterparties to assess the creditworthiness of individ-
ual bond issues, CROs earn profits by producing classificatory information that
regulators find helpful and that investors and guarantors use to compare credit
spreads on issues of risky debt. However, CRO revenues come not from the inves-
tor or regulatory side, but from fees that issuers pay CROs for analyzing the credit
quality of different issues: although accurate ratings benefit investors and issuers
alike, issuers are asked to pay because, once it is announced, a security's credit
rating becomes public knowledge. This asymmetric arrangement poses an
obvious conflict of interest for CRO managers. Borrowers have an incentive
to play different CROs against one another and to hold out for higher-than-
appropriate ratings. For issuers and securitizers, the counterincentive to seeking a

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corrupt rating is that they also need to employ a CRO that has a well-established reputation for honest and accurate work.

Until the 1970s, ratings were generally in low demand (Sylla 2001). CROs’ value added was uncertain, and as recently as the 1960s these firms employed only one to two dozen analysts, with their then meager revenues coming mostly from sales of research (Partnoy 2001). Ratings were long criticized as lagging behind the business cycle—issuing upgrades late in cyclical upswings and downgrades late in slowdowns in ways that did not help investors to anticipate or protect themselves against a rise in defaults. This is amply demonstrated by the avalanche of ratings downgrades in the 1930s. However, in 1975 the SEC created the designation of a “Nationally Recognized Statistical Ratings Organization (NRSRO),” and over time ratings-based government rules restricted the decisions of a variety of actors (pension funds, insurance companies, banks, municipalities, and so on). Government reliance on ratings encouraged private organizations to incorporate ratings into their own governance procedures or to advertise that only investments above a certain rating would be held. With financial intermediaries either strictly required to hold only highly rated instruments or allowed to hold less capital against highly rated securities, ratings understandably grew in demand, as did the pressure for “rating inflation.” By the late 1990s, when the structured finance business expanded sharply, the CRO industry expanded apace. By 2006 Moody’s, which won a large share of this business, was generating over $6 million per employee and employed over 20,000 persons worldwide.

Because many regulatory agencies, investors, and bond insurers rely on CRO credit ratings to substitute for their own due diligence, the contract interest rate an issuer has to pay falls whenever its credit rating rises. In turn, for established CROs, the time and effort required to build a reputation for reliability, and the bureaucratic difficulties to be surmounted in being named an NRSRO, create a dual barrier for would-be new entrants into the CRO industry. Reinforced by the tendency of established firms to acquire lesser players, these barriers give them a leg-up in foreign venues as well. The resulting oligopolistic market structure helps to explain why major ratings organizations do not compete either in the models they use to assess credit risks or in the criteria they use to map the forecasts their models produce onto different rating classes. This similarity in methods means that errors are likely to be similar too. The core problem in the securitization crisis is to understand how and why securitizers, CROs, and bond insurers drastically over-rated and oversized the highest-quality tranches of structured-finance obligations.

Part of the explanation lies in the conflict that managers and line employees of such firms faced between preserving the long-run value of their firm’s reputation and chasing bonuses and wage raises that short-run revenue expansion can generate. Errors in classification are slow to reveal themselves. They can only be
established after a long and variable lag. This lag means that, to keep a firm's reputation strong over the long run, compensation structures must include features that promise to reward employees for taking the long view and penalize them for succumbing to short-termism. Given the high proportion of revenues earned in recent years at the top three ratings firms (Moody's, Standard & Poor's, and Fitch) from rating securitizations, individual managers and analysts must have been sorely tempted to risk the firm's reputation to secure or retain the repeat business of the biggest issuers, and it is doubtful that salary structures fully neutralized this temptation. According to Portes (2008), 44 percent of Moody's 2006 revenue came from advising issuers first on how to collateralize and to assign (that is to slice or "tranche") cash flows from pools of securitizable assets to get a desirable package of ratings, and then going on to rate the credit risk of the various packages that it and other CROs helped to construct. With compensation in much of the financial sector increasing and being linked to short-term paper profits with little attention to risk it is hardly surprising that the same occurred in CROs.

What's Different about Rating Structured Instruments?

In principle, each rating should be interpreted as an interval estimate: that is as the sum of a point estimate and a two-sided margin for error. When a CRO does a good job of rating bonds or complex securities, the observed value of default and loss rates in different rating classes correlate closely with the riskiness of the grade that securities in each category had previously received. Because securitized instruments are claims on a fixed pool of individual assets, servicers who manage the cashflows can do little to mitigate the potential impact of adverse events on investor returns. Even if point estimates of loss exposure were the same for a bond and a securitized claim, their margins for error would be very different. This means that it was misleading for CROs to employ the same set of letter grades to rank the through-the-cycle loss exposures of the tranches of structured deals and ordinary bonds.

Even on ordinary bonds, ratings are lagging indicators whose changes tend to come too late to help investors avoid losses when an issuer's credit standing weakens or to achieve gains when an issuer's prospects improve. This leads scholars to question whether on most deals CROs add enough informational value to justify their existence (Sylla 2001). However, because of the growing complexity of structured instruments, there can be no doubt that ratings were central to the successful placement of synthetic securities. The SEC and other regulators effectively ceded to CROs their public-interest responsibility for monitoring and disclosing investor loss exposures in structured financial instruments. Investors flocked to the highly rated tranches of structured securitizations precisely because they
promised miraculously to combine AAA and AA ratings with extraordinarily high yields—and regulators did not challenge this promise. As noted earlier, these high yields came mostly from blending in returns from the lower-rated components of structured instruments.

Although actual and proposed reforms seek to rework the details of CRO and issuer interactions, the process of rating complex structures of securitized debt differs critically from that of rating a simple bond issue. The process of rating a structured product is a sequence of bilateral negotiations that starts with the issuer specifying the mix of credit ratings it is looking for. CROs compete by specifying the subordination structure and level of credit support needed to obtain the ratings desired. That a give and take between CROs and securitizers did occur is suggested by the high concentration of CRO forecasts for structured deals that lie at “notches” just above the thresholds that would move the different tranches into the next lower ratings class (Mason and Rosner 2007). This implies that the associated interval estimates on most issues regularly dipped at least into the next-lowest rating class.

Assessing the risk of a portfolio of infrequently traded and innovative instruments and monitoring factors that change this riskiness over time pose difficult problems for data verification and analysis. CROs could and should have identified and addressed these problems more carefully, and in particular, using a prudent-man standard, they should have discounted the margins for error assigned to complex mortgage securitizations for the modeling, sampling, legal, and documentation risks that investors were asked to assume. If the industry had been less oligopolistic, competitive pressure likely would have led independent parties to be tasked with auditing the models and criteria on which individual CRO ratings were based and to fact-check the data used to estimate model parameters. Most importantly, conscientious outside reviewers would have insisted that CROs update their models and rating methods as soon as evidence began to develop that loan pools in the 2005 and 2006 vintages were defaulting at unprecedentedly early dates. Without the protection of ratings-based legal “safe harbors,” fund managers seeing the same events would have had their decisions exposed to adjudication in court.10

To lessen ratings volatility, CROs prepare what they term “through the cycle” ratings. The models CROs use for this task were known to incorporate unverifiable and overly convenient assumptions about correlations, worst-case scenarios, and marketability that were bound to break down (that is to lose applicability) in periods of severe financial distress. Many deal structures were new and yet to be tested against the stresses that might develop during a business-cycle downturn. For example, ratings on instruments based on negative-equity or optional-payment mortgage loans to low-income households used experience-based data on default frequency and loss given default drawn entirely from a period of macroeconomic expansion and soaring house prices. To simulate through-the-cycle
experience, observed defaults on innovative instruments ought to have been sup­plemented by synthetic data designed to introduce effects that might unfold in times of price decline and market stress (Altman and Rijken 2006).

**CROs Need to Take Responsibility for their Mistakes...**

Formally a CRO’s aggressive declaration that an adequately documented “true sale” of a particular loan pool had taken place was a key step in moving the assets off originator and securitizer accounting balance sheets. But CROs apparently felt no duty to describe how fully the ownership of the pool could be documented. Hence their judgments on this matter could have no legal standing in any case.

The quality of CRO analysis was and is further undermined by CRO efforts to avoid legal responsibility for any mistakes. Despite their intense and critical involvement in designing securitization structures, CROs claim only to be expressing an “opinion.” They insist that the constitutional right of free speech protects them from lawsuits for damages suffered by investors who chose to rely on what might turn out to be incompetent or negligent opinions. To create a foundation for this defense, CROs routinely incorporate language into their reports stating that it is “unreasonable” for anyone to rely on their “mere opinions,” which should not be construed by anyone as “investment advice.” Ironically, for investors and regulators, the reputational damage CROs have absorbed from massively over-rating structured securitizations has imparted to these disclaimers an element of unintended truth that has undermined the value of their brands and is forcing them to rebuild confidence in the value of their work.

Because CRO fees were so large, and because synthetic securities could not legally have been sold in large quantities to many investors without the blessing of high ratings, the courts might impose liability on CROs in any case. Whenever someone (say, a lawyer) collects a large fee for communicating his or her opinion to another party, the distinction between opinion and advice seems to break down. The sheer size of the fees collected for forming and issuing opinions about the riskiness of complex securitizations renders hollow the claim that users should not—and therefore would not—rely on them. In fact, CROs had to foresee and value that reliance, as it explains why they were being remunerated so well. They should share responsibility with any securitizer and insurer of these deals who distorted or failed to verify the value of the analysis on which CRO “opinions” ultimately were based.

...but the Authorities also Played a Role

On the grounds that they were helping innovative U.S. firms to compete effectively in global markets, federal supervisors refused to take on the political and practical
challenge of establishing and maintaining their ability to see and discipline com-
plicated risk exposures. By tolerating the decline in transparency that came with 
structured finance; by not recognizing CRO incentives and that they were using 
poorly tested models and issuing aggressive legal judgments about whether non-
recourse “true sales” of the underlying loans had actually taken place; and by not 
requiring CROs to discount their ratings on these instruments for the modeling 
and documentation risks inherent in structured finance—supervisors made it dif-
ficult for themselves and other market participants to recognize and discipline 
these risks. As a result investors were fed overly optimistic estimates of the credit 
quality of the instruments they purchased. The flaw in relying more on CROs is 
critical for developing countries, since, as noted below, prior to the crisis many of 
them announced plans to rely more on ratings in determining bank capital 
requirements, in a rush to adopt Basel II.

Going forward, the problem is to find reliable ways to express and value differ-
ces in risk on structured instruments. One way is for CROs to bond the quality 
of their work by subjecting it to effective independent review (Goodhart 2008a) 
and setting aside some of their fees in a fund from which third-party special 
masters or expedited civil judgments could indemnify investors for provable harm 
in instances where the independent reviewers find that negligence or misfeasance 
occurred. Alternatively, requirements that various intermediaries and fund man-
gers hold rated instruments, or received relief from capital requirements by 
doing so, could be dropped, and the category of NRSRO, which implies a govern-
ment sanctioning of the ratings process, could be abandoned.

**Did Mark-to-market Accounting Cause the Crisis?**

In the United States, accounting rules consist largely of generally accepted 
accounting principles (GAAP) and generally accepted auditing standards (GAAS). 
GAAP sets rules that constrain (but do not fully determine) the information 
systems that financial-institution managers may use to document their firm’s 
economic condition and performance. GAAS sets procedures to be used in exam-
ining and verifying a firm’s reports and records for compliance with GAAP.

In a world of diverse and evolving circumstances, reporting systems inevitably 
convey options about where to book assets and liabilities and how to measure risk 
exposures and changes in value. The existence of these options and the ways that 
particular institutions use them to conceal losses is only imperfectly understood 
by outsiders. From a statistical point of view, accounting income and net worth 
are merely estimates of a firm’s economic income and ownership capital. Because 
contemporary reporting systems only provide imprecise point estimates of the 
current and future earning power of a firm, careful users of accounting data must
acknowledge the existence of a margin for error. In different firms and in the same firm at different times, measures of income or net worth may be biased up or down and may vary substantially in their exposure to estimation error. GAAP has never required a firm to report interval estimates or to disclose helpful supplementary information about the degree of imprecision or bias inherent in the methods its managers adopt.

Observers who fail to acknowledge the many reporting options that fair-value accounting still allows blame it for causing the crisis. They argue that thin markets can cause a downward spiral in asset prices by encouraging institutions to sell troubled assets quickly and “forcing” them to take writedowns that understate the “true” value of the underlying assets. However, in creating and deepening the securitization crisis, the most serious impact of accounting rules did not emanate from the values chosen to represent various on-balance-sheet positions. It came instead from using off-balance-sheet extensions of commercial and investment banks to warehouse risks that, for reputational reasons, would have to be brought back onto the balance sheet if and when cumulative losses developed.

Especially at large and complex financial institutions, individual managers have strong incentives to discover and to exercise reporting options that overstate their capital and understate their exposure to loss. This expands their ability to extract implicit subsidies that risk-taking can generate from implicit safety-net support.

Concealment processes may be characterized as simple and complex forms of arbitraging the supervisory system. Whatever their other economic benefits, innovative instruments are designed in part to create or expand concealment options. Moreover, trade associations and managers of systemically important institutions routinely use their political and economic clout to lobby standard-setting bodies for accounting rules that make it harder for government supervisors to monitor and to discipline their important exposures to loss.

Under the historical-cost valuation principles in use during the 1980s, U.S. authorities allowed and even encouraged economically insolvent “zombie” institutions to hide their insolvency and to roll over their debts solely on the strength of government guarantees (Kane 1989). The rules did not make them record deterioration in market values, even of assets and liabilities for which perfect substitutes were trading regularly in an organized market. These rules (which still govern positions in a U.S. depository institution’s “banking book”) encouraged distressed or ruined financial institutions to endeavor to grow out of their insolvency by pursuing long-shot strategies that created stockholder value by shifting responsibility for large loss exposures onto financial safety nets.

In the United States a major purpose of moving to fair-value accounting was to require some of the developing losses at troubled financial firms to be recognized and resolved more promptly than in the past. It is mischievous for loss-making or
undercapitalized firms to blame fair-value accounting for causing the trouble they encounter in rolling over their debt. At best, fair-value accounting is a messenger that makes private counterparties and officials charged with managing a country’s financial safety net aware more quickly of their need to guard against the possibility that a particular firm (such as Bear Stearns) might be seeking to fund endgame “gambles for resurrection” at their expense. Realistically, careful exploitation of the many reporting options that fair-value principles convey still allows a clever manager to greatly understate developing losses. By the time accounting evidence of insolvency can emerge, well-informed interval estimates of a firm’s economic net worth would be deeply in the red.

It is misleading for critics to claim that, because temporarily disorderly markets may overshoot equilibrium prices, fair-value accounting “forces” financial institutions to book paper losses that have no practical importance. First, under fair-value principles, many portfolio positions are “marked to model” rather than to an actual transactions price. This creates incentives for managers of distressed firms to ask their quantitative staff to adjust model outcomes until they produce prespecified results. Personnel responsible for modeling decisions can do this by expanding or contracting either their samples of data points or the parameter space of their models to eliminate uncomfortable valuation outcomes. Attempts to defraud investors and creditors with models or assumptions that violate “prudent-man” standards of negligence should be settled in the court system.

Second, risk managers are free to move assets that are sensitive to changing credit spreads, either into off-balance-sheet entities or from their firm’s “banking book” to its “available-for-sale” portfolio. As in the past, GAAP asks that impairments in borrower credit that affect banking-book assets be translated into explicit additions to loss reserves. Increases in loss reserves reduce reported earnings and (if large enough) erode accounting net worth as well. While assets that are classified as available-for-sale have to be fair-valued, the writedowns do not pass through current earnings and charges taken directly against GAAP net worth are not incorporated into Basel measures of regulatory capital that supervisors were using to determine capital adequacy. Finally, in estimating GAAP capital in an environment of illiquid or panicked markets, banks are allowed to ignore impairments implied by observable credit spreads simply by declaring that in management’s considered view the impairments are only temporary.

Notwithstanding that mark-to-market accounting did not contribute to the crisis, U.S. authorities in early 2009 decided to ease these rules in an effort to relieve the banks of pressure. Notably this contrasts with the advice given to developing countries in past crises, where the IMF and a variety of international experts have advised developing country authorities to take account of market values in determining the viability of banks.
Did Financial Globalization Exacerbate the Crisis?

The globalization of financial markets and institutions tends to heighten competition between alternative regulatory systems (Kane 1999, 2008). Although economists often treat regulation merely as a tax on institutional income, financial institutions understand that regulation is a service that generates benefits as well as costs. Regulatory benefits include improving customer confidence and convenience. Supporting bank efforts to accumulate and exercise market power benefits banks, while resisting these efforts benefits society. Because regulation requires resources to produce, both the efficiency of its production and its pricing can vary.

In a world in which financial markets are globalized, services that provide regulatory benefits are available both from foreign suppliers and from domestic regulators of differently chartered firms. Rules and enforcement systems are continually tested and reshaped by changes in the net regulatory burdens that other jurisdictions offer. This means that a worldwide market for regulatory services exists. Regulation is supplied competitively and accepted voluntarily to the extent that entry and exit opportunities exist for banks willing to incur the transaction costs of switching all or part of their regulatory businesses to another supplier. Competition has the benefit of lowering net regulatory burdens for the regulated financial institutions. While heightened international competition has tended on balance to displace poor systems of regulation by better ones, the maximum improvement in any country is limited by switching costs and by the level of best-practice regulation that can be found elsewhere.

In the current crisis, securitization helped to bring firms that were supervised in different regulatory systems into sharper competition with one another. In this environment, competition not only encouraged deregulation, it also and more importantly reduced the effectiveness of supervision. Securitization put pressure on particular regulatory enterprises to relax their scrutiny of innovative financial instruments as a way of defending or extending their bureaucratic turf. In the United States the worst offender was the Office of Thrift Supervision (OTS). The Treasury’s Office of the Inspector General confirmed that the OTS allowed several thrifts to backdate capital infusions specifically to avoid showing a capital deficiency. Other banking supervisors helped their clientele by legitimizing cutting-edge ways to hide and transfer risk without fully exploring the threat that formally uninsured “shadow” affiliates (such as structured investment vehicles) and complex new contracting structures (such as doubly collateralized debt obligations) imposed on individual-country safety nets.

Whenever a regulator authorized an innovative entry by a foreign or nontraditional firm, it also had to relax restraints that might make it hard for its traditional clients to compete with the new entrants. Institutions pressed politicians to make this happen promptly. In most countries, defects in accountability led
supervisors of commercial and investment banks to assess the risks of innovative instruments of risk transfer with less watchfulness than these instruments deserved. With structured securitizations, the SEC, banking supervisors, mortgage insurance firms, and investors jointly outsourced their duty of vigilance to appraisers, accountants, and CROs. They did this despite knowledge of these firms' obvious conflicts of interest and outsized delays in recognizing problems or downgrading distressed securities in past downturns (Portes 2008). While supervisors relaxed entry restrictions, they resisted the exit of domestically important commercial and investment banks by standing ready to let unprofitable clients be supported by safety-net bans and guarantees.

The goal of financial reform should be to induce nondiscriminatory and efficient patterns of regulation and supervision. Regulators should be made accountable not just for producing a stable financial economy, but for providing this stability fairly and at minimum long-run cost to society. In practice, this would require embracing market-based standards of supervisory performance designed to identify undercapitalized institutions promptly and to require them to shrink, raise more equity capital, or pay higher interest rates for their debt. The globalization and information revolution that is underway in finance today makes it shortsighted to require taxpayers to subsidize weak institutions and inefficient patterns of real investment.

Regulatory efforts to respond to the globalization of financial institutions and markets have been led by the Basel Committee on Banking Supervision. This Committee meets regularly to discuss ways of harmonizing national standards for banking supervision. The Committee's stated objective is to eliminate perceived cross-country competitive inequalities and to improve financial stability by promoting comprehensive risk management and consistency in regulatory standards across countries for multinational firms. Its major accomplishment is to negotiate the Basel I and II capital accords.

Has Basel II Failed Already?

The crisis has spawned a growing argument about the role Basel I may have played in causing the crisis and about whether Basel II, had it been implemented earlier, could have lessened the turmoil. This debate is critically important for developing countries, many of whom are on record as planning to adopt the revised capital framework. Basel I distinguished two types of capital: Tier One Capital (core capital, roughly the same as stockholder equity) and Tier Two Capital (which includes some hybrid forms of debt). It also defines a formula for risk-weighting categorized "buckets" of similar asset holdings and summing up the weighted values to form an aggregate measure of risk exposure called "risk-
weighted assets" (RWA). Banks are required to hold at least 8 percent of RWA in capital, at least half of which must be in Tier One (equity plus retained earnings).

The weights employed in Basel I gave banks no credit for the extent to which they might have diversified or hedged the risks in their loan portfolio; risk was evaluated on a loan-by-loan basis, rather than at the portfolio level, taking into account covariances. The formulas also did not make any effort to account for operational, interest-rate, or exchange-rate risks, though market risks were incorporated later. Finally, Basel I failed to link the risk weights it applied to particular assets to the risk premiums that can be observed in loan markets.

These weaknesses provided opportunities for arbitrage that contributed to the current turmoil: if regulatory demands for capital generated a compliance burden at a particular bank, its managers could eliminate this burden by selling or securitizing a sufficient amount of assets. For example, under Basel I, mortgages held on a bank's balance sheet were subject to a 50 percent weight, while securities backed by mortgages received only a 20 percent weight. No risk weights were assigned to loans that were sold to special-purpose bank-sponsored securitization conduits, which were regarded as "off balance sheet," or to short-term lines of credit with which sponsors supported these conduits.

Proponents of Basel II argue that the new accord will ameliorate weaknesses in Basel I, since Basel II is more granular and mitigates securitization incentives by reducing the capital charge for mortgages held on the balance sheet to 35 percent and by imposing a capital charge on short-term lines of credit. Nevertheless, longstanding concerns about the Basel approach have been reinforced by the recent turmoil.

Basel II—which was negotiated in 2004, but is still in the process of being implemented—was born out of widespread dissatisfaction with the obvious shortcomings in Basel I. The new agreement is much more complex than Basel I and rests on three mutually reinforcing pillars: (1) minimum capital requirements; (2) supervisory review of banks' capital adequacy; (3) strengthened market discipline of capital adequacy. Besides increasing the number of risk categories in pillar one, Basel II proposes to use a mix of statistical methods and expert opinion to track a bank's changing exposure to insolvency risk over time. It also envisions improved disclosure as a way to generate complementary market discipline on bank capital positions. However, Basel II does not improve on Basel I, either in how it measures capital or in the arbitrary target ratios it sets: the definitions of Tier One and Tier Two Capital and the rules limiting their components are unchanged; and the Committee continues to insist on the 4 and 8 percent minimum ratios of capital to risk-weighted assets without any rationale as to why either level is appropriate.

The new accord sets out to make capital more sensitive to credit risk in one of two ways: through reliance on external credit ratings issued by rating organizations (the Standardized Approach) or through reliance on internal ratings based

Caprio, Demirgüç-Kunt, and Kane
on banks' own risk models (the Internal-Ratings-Based Approach, IRB). The Standardized Approach requires banks to allocate their exposures to risk buckets and resembles Basel I, except that it incorporates a wider range of weights and asks countries to choose a set of external rating organizations and use their assessments of risk to determine country-level capital requirements. As of 2008, 105 countries' authorities have stated their intent to adopt Basel II (FSI 2008) — and in its present evolution developing countries, lacking the data and skills for reliance on banks' models, would have to place greater weight on ratings in setting capital requirements.

The IRB Approach makes use of banks' own internal risk systems for specifying minimum capital requirements, subject to the requirement that their internal models satisfy regulatory eligibility conditions. Under pillar 2, Basel II grants national regulators substantial discretion over the implementation of these options: countries could end up with widely divergent levels of required capital. This would generate increased opportunities for regulatory arbitrage and undermine effective capital control. Indeed, standards under Basel II could cease to be global standards at all, which would defeat the original purpose of the accord, as well as the raison d'être of the Basel Committee.

Most importantly, recent events challenge the appropriateness of both the Standardized and IRB Approaches of measuring capital charges against credit risk. The use of ratings to set risk weights in the former encourages ratings inflation because ratings organizations face revenue-based incentives to relax ratings requirements. In addition, credit ratings do not confront the issue that capital requirements are supposed to address. Loan-loss reserves are tasked with accounting for anticipated losses. Capital requirements are intended to provide a buffer against unexpected risks. It does not make sense to use credit ratings to set capital requirements, since they convey no information about the volatility of an asset's return around its mean exposure to loss. Ratings may be useful for establishing loss reserves for particular assets, but they say nothing about how a bank's net worth or its portfolio of assets might vary in value with unexpected events. The amount of capital that must be set aside to achieve a particular target level of safety for a particular institution has to be linked explicitly to measures of the volatility of its earnings.

The internal models employed by even the largest and most sophisticated market participants also failed to track risk accurately. The models proved inadequate in that they systematically underestimated the types of risks in complex securitizations that produced large losses and substantial downward revisions in earnings. The Basel Committee undermined accurate modeling by deciding to treat five years of data as an adequate sample span. This time period is too short to capture a full business cycle. Any serious attempt at risk modeling should have confronted the aberrant behavior of housing prices in the United...
States and other countries, as well as evolving features of the market (for example new types of borrowers, lower downpayments, new mortgages in which the buyer had the option of determining payments in the initial years, and so on). Thus this experience demonstrates that it is a mistake to assess risk mechanically by using models estimated with data from periods when important features were changing. In addition, complex financial models and datasets can be manipulated to provide desired outcomes.

Although Basel II employs a more detailed categorization of credit risks, it fails to address “liquidity” risk and reputation risk, both of which have proved important in the current turmoil. Once doubts emerged about the accuracy and reliability of ratings and accounting net worth, holders of maturing short-term liabilities refused to renew their funding. Feedback from this so-called liquidity risk intensified credit and market risk. Reputation risk encouraged lending institutions to rescue off-balance sheet shadow entities they had sponsored, even though sponsors were not contractually obliged to assume these losses. An important reason the crisis spread rapidly from subprime loans to other securitization structures, and that the turmoil has persisted, is that the subprime meltdown revealed that serious contracting weaknesses existed at every stage of the process of securitized risk transfer. Inadequate documentation of underlying mortgages, the daunting complexity of securitized structures for allocating and reallocation of cashflows from questionable loans, and the opacity of off-balance-sheet vehicles that purchase securitized instruments led investors to seek comfort not from an understanding of underlying cashflows, but from credit enhancements and the behavior of dealer spreads. Neither regulators nor market participants knew to whom risks were formally allocated, let alone on whom potential losses might finally fall. The disclosures envisaged in pillar three of Basel II have a long way to go before they can claim to unravel these issues.

Finally, while Basel II assigns to national regulators the responsibility for monitoring and controlling insolvency risk, it does not develop any protocols for preventing financial institutions from becoming insolvent, nor does it impose requirements for prompt corrective action (PCA) on supervisory authorities. The accord will eventually have to benchmark a pattern of actions that home and host authorities should take as the capital position of a client institution slips deeper and deeper below acceptable standards and is not promptly replenished. Detection and resolution of impending insolvencies is crucial. The central problem in financial regulation is to make sure that even in politically and economically stressful circumstances, regulators have robust incentives to protect taxpayers by identifying troubled banks and forcing them to recapitalize before their capital can become exhausted.

Basel’s arbitrary “risk”-weighting process has already failed. This failure underscores the importance of enforcing PCA obligations and monitoring leverage per
se. Even in the midst of the crisis, large financial institutions managed to keep from violating Basel I’s risk-weighted targets by gaming authorities with sophisticated (but faulty) risk-transfer techniques. For this reason during the turmoil, markets ignored RWA ratios and focused instead on the more transparent ratio of assets to tangible net worth as the primary indicator of financial strength. We think that this is excellent advice for developing countries to follow, as argued below.

Because the volatility of and correlation between returns on different assets tend to surge in crises, the risks that modern institutions take cannot be captured in a static formula, no matter how complex it might be. When static rules are also complex, they reduce transparency and generate loopholes that foster regulatory arbitrage and support acts of supervisory forbearance. To be effective, prudential regulation must be adaptive and it must combine supervisory stress tests with market oversight. To track the changing importance of particular risks in a timely fashion, supervisors therefore should use market signals.

Current market turmoil underscores the inadequacy not only of Basel’s static formulas, but also the dangers of taking accounting statements at face value, both of which are of great relevance for countries regardless of their income level. Safety-net subsidies increase effective leverage, weaken market discipline, and reduce the exposure of formally at-risk loss bearers in ways that render the usual accounting disclosures ineffective. Subsidy-induced innovations can only be countered by conscientious supervision. Supervisors must not only draw on—but help to develop—informative market signals, such as those imbedded in the prices of credit default swaps and subordinated debt. Deal making in these markets incorporates timely estimates of changing default probabilities and loss exposures. However, prices in these markets can only be a strong source of discipline under two conditions: (i) market participants do not expect to be bailed out when trouble develops; (ii) investors have access to regular flows of high-quality information (Barth, Caprio, and Levine 2006). A crucial element in limiting expected bailouts is to assign political accountability for measuring and defending safety-net costs to regulators and elected officials.

Lessons for Developing Countries

Although this crisis began in industrial countries and was associated in the United States with sophisticated financial innovations, both this crisis and its many antecedents offer a number of lessons for developing countries. When a crisis is in process, interest in drawing lessons from the past surges. Unfortunately, officials and market participants alike have vested interests in promoting views that are most beneficial for their reputation, balance sheet, or both. This is why
popular theories of past crises zero in on the bad behavior of a few convenient scapegoats. However, crises rarely result from the corrupt acts of a few greedy individuals or from a handful of isolated regulatory mistakes. Crises have their roots in longstanding structural flaws in the way that financial institutions and government officials interact. With rare exceptions, crises in developed and developing countries alike are caused or exacerbated by perverse incentives that make it worthwhile for politicians, regulators, and the private sector to ignore mounting danger signals until it is too late to avoid a widespread meltdown in asset values.

Modern Crises Are Often Revealed by Identifiable Shocks that End Booms or Bubbles in Important Macroeconomic Sectors, but the Underlying Distortions Were Building up for a Long Time

The meltdown that began in 2007 is not the first time that financial institutions, in taking advantage of regulatory loopholes, engaged in reckless risk-taking that fueled a long-lasting bubble in asset prices that in one way or another had to burst eventually. Extraordinary risk-taking is easier to disguise and rationalize during bubble or boom periods. Increasing leverage based on unsustainable surges in the price of residential, commercial property, or both, on the one hand, and corporate stock, on the other, featured prominently in an end-of-the-century spate of crises: in Japan (1990s), Malaysia (mid-1980s), Mexico (1994), Sweden (1991–94), and East Asia (1997–98). The current crisis in Ireland and several Eastern European countries occurred without sophisticated financial products, and the underlying distortions—an unsustainable housing boom in the former, and widespread currency mismatching even at the household level in the latter—were not difficult to detect.

Historically, wherever a banking industry has existed, economic booms and asset bubbles have often preceded financial crises. Demirgüç-Kunt and Detragiache (2005) survey a large literature that shows that the likelihood of crises increases with the strength and duration of economic booms and that banking crises are occasioned by shocks in asset prices, output, terms of trade, and interest rates. In addition, the same scholars (2002) assemble convincing evidence that the character of a country's financial safety net plays a critical role in encouraging institutions to make themselves vulnerable to the particular shock that brought each crisis on.

This is not to say either that crises would not occur in the absence of a safety net or that financial safety nets should be dismantled. It is accurate to say that financial crises have become more frequent and more expensive (in terms of losses per dollar of deposits) as safety nets have expanded. By permitting losses to spread to taxpayers rather than being borne solely by contracting parties, safety
nets displace market discipline (Calomiris 1995). By making it easier to attract deposits, safety nets encourage private parties to lever themselves more extensively; and increasing leverage shifts more and more of the downside onto the national safety net.

Financial Deregulation Is Often Blamed for Causing Crises, but the Fact and Character of Deregulation Is Itself Shaped by the Ways that Governments and Regulated Institutions Interact

As financial regulations were relaxed in the 1970s and 1980s, and increasing reliance was placed on prudential supervision (with little accountability), the frequency of crises did increase (Demirgüç-Kunt and Detragiache 1999). However, deregulation does not necessarily provide greater opportunities for shifting private risk exposures onto the safety net. This happens only when authorities fail to adapt their systems of insolvency detection and resolution appropriately. In principle, relaxing controls on interest rates, charter powers, and portfolio structure promised to improve the ability of banks to foster economic growth and economic justice. But coupling deregulation with inadequate supervision of leverage and asset quality is a recipe for disaster, because “desupervision” allows safety-net subsidies to be extracted by doubling and redoubling risks.17 Blaming the current turmoil on financial deregulation without mentioning the role of deficient oversight suggests that rules—not incentives—are at fault (Stiglitz 2008; Krugman 2008). During the period of deregulation, most industrialized countries introduced many new rules. The imbalance between the attention paid to rules and incentives is well illustrated by the 2004 Basel II agreement which devotes 16 pages to issues of market discipline and 225 pages to spelling out formulas and strategies imbedded in pillar one and options for national discretion authorized in pillar two.

Over Time, Regulation-induced Innovation Leads to Progressively More Complex and Less Transparent Forms of Risk-shifting

Financial crises are often driven by breakdowns in innovative financial instruments or arrangements designed to exploit loopholes in a country’s risk controls. Recent examples of risk-shifting include: overexposure to foreign exchange risk (Chile, 1981; Mexico, 1995; Nordic countries, early 1990s; Turkey, 1994; East Asia, 1997); aggressive lending to politically important foreign markets (in the developing country debt crisis of the 1980s); complex deal-making (in the securitization crisis). In seeding the current crisis, institutions abused derivative instruments—whose existence had been rationalized as vehicles that would diversify and hedge risk—in order to magnify safety-net loss exposures. Abusive trading of
derivatives instruments fueled the Orange Country fiasco (Jorion 1995) and the growth of credit default swaps (CDS).

**Because Institutions Can Count on Crisis Resolution to Be Mismanaged, Safety-net Subsidies Flow to Institutions Willing to Risk Insolvency**

Walter Bagehot's classic policy advice for managing liquidity during a systemic crisis is for the central bank to lend freely to solvent banks—but to minimize safety-net subsidies, the loans are to be made at a penalty interest rate and only on good collateral. Put differently, his advice is for governments to avoid lending to insolvent banks at all, even on good collateral, and certainly not at below-market interest rates. Unfortunately, modern governments pay only lip service to this principle. Supervisory authorities find it hard to mobilize the political and budgetary support needed to follow the Bagehot strategy. In their study of 12 recent crises, Kane and Klingebiel (2004) found that all but one country adopted a crisis-management strategy that combined blanket guarantees with extensive and immediate liquidity support for insolvent institutions.¹⁸

Advocates of using liquidity injections to halt a systemic crisis argue only that sweeping guarantees and extensive liquidity support can stop the panicky flight of depositors and other institutional creditors to less risky venues. But this begs the question of whether social costs and adverse distribution effects could be reduced by following an alternative strategy (Kane 2001).

**Incentive Conflict not only Explains How a Particular Crisis Develops, but How the Manner in which a Crisis Is Resolved Affects the Frequency and Depth of Future Crises**

Even in the midst of a financial crisis, it is inefficient to set aside long-term goals completely. Providing extensive liquidity support and guarantees to insolvent institutions subsidizes "gambles for resurrection" and strengthens the risk-shifting incentive schemes that spawn crises and guarantee their recurrence. Without incentive reform, short-sighted methods of crisis resolution create the expectation that they will be used again when the next crisis inevitably arrives. This expectation undermines market discipline and financial stability in future periods.

The short-term benefits of liquidity injections have been oversold. Such policies seldom actually speed the recovery of a nation's real economy from a banking crisis or lessen the decline in aggregate output. Honohan and Klingebiel (2003) measure the impact of different crisis management strategies on the ultimate cost of resolving distress in 40 different financial crises. They find that blanket guarantees, open-ended liquidity support, and regulatory forbearance significantly increase the ultimate fiscal cost of resolving crises. They also find that spending...
more to support distressed institutions does not speed the recovery. Instead, providing liquidity support for insolvent institutions tends to prolong a crisis. It does this by distorting risk-taking incentives so extensively that sound investments and healthy exits are delayed and additional output loss is generated, as discussed in Demirgüç-Kunt and Serven (2010).

Past Crises Provide Important Lessons, but They Fall on Deaf Ears

History provides clear lessons about how to minimize the frequency and cost of financial crisis. The refusal to embrace these lessons underscores the existence of persistent defects in the incentives that govern the ways in which politicians, regulators, and financial institutions interact. Authorities routinely underestimate the frequency and depth of crises. When crises do occur, they prefer to resolve the conflicting pressures under which they must function by treating troubled institutions generously, claiming that it is their duty to minimize potential short-term contagion at all cost. Underinvesting in crisis preparedness implants a preference for improvisation. But improvisation leads to inefficient and myopic solutions.

Instead we argue that there are clear principles for regulatory reform derived from recent crises and aimed not at reallocating regulatory and supervisory authority, but at establishing incentives that would lead supervisory authority and market forces to operate more effectively. We stress that the current crisis exemplifies not just the limits of market discipline, but the power of government-induced incentive distortions—and the limits of official supervision as commonly practiced. The failure of private parties to exercise sufficient due diligence was rooted in the failure of government supervisors to challenge decisions made by private accountants and CROs. They neglected their duty of examining and publicizing the implications that these decisions might have for safety-net loss exposure. By tolerating a decline in transparency, supervisors made it difficult to recognize and price the risk expansion not only for themselves, but also for the market participants. Many developing countries share this trait of a low degree of financial sector transparency, and the current crisis demonstrates not only the importance of increasing it, but the continuous nature of the battle to do so as well.

Authentic Reform Must Address the Contradictory Political and Bureaucratic Incentives

In the recent crisis these incentives led regulators and supervisors first to outsource their due diligence and then to resolve the crisis in inefficient ways. Incentive reform is politically difficult because existing defects in supervisory incentives did not come about by accident. They reflect the political preferences of regulated institutions and other politically powerful market participants. No
matter how drastically a proposed reform may redistribute supervisory authority, unless it also establishes accountability and transparency for the costs of safety-net management, effects will prove more ostensible then real. For this reason, our reform proposal focuses on improving the chain of incentives under which market discipline and official supervision operate. While we have many other recommendations suitable for industrial countries, here we concentrate on those that are most relevant for developing country authorities.

**Lender Reform.** Compensation for loan officers must be linked to long-term performance rather than to short-term profits. Whenever authorities see compensation in the financial sector growing rapidly they must suspect that great risk-taking and risk-shifting is occurring. Governments can reinforce (rather than undermine) market discipline by assisting in the dissemination of information about contract evolution and by encouraging development of better information systems. In developing countries, accurate information is often quite scarce, and officials should consider ways to encourage or compel greater information disclosure by intermediaries.

**CRO Reform.** CRO reform, at the top of the industrial country agenda, will have a significant impact on developing countries, and should incorporate two main elements: (i) withdrawing government blessings from their work and (ii) improving CRO accountability for ratings decisions. Because the NRSRO designation provides an explicit government blessing and introduces barriers to entry into the ratings business, it should be eliminated. Most importantly, references to ratings should be removed from all SEC and bank regulations, including Basel II.

Government rules that rely on CRO ratings reduce investor incentives to conduct sufficient due diligence before making investments—indeed it is likely that far less securitization would have occurred if those managing other people’s money were not protected by the requirement that they hold highly rated instruments. At the same time, such rules reduce the accountability of government regulators and supervisors for neglecting their duty of oversight. By outsourcing due diligence to CROs, regulators shift the blame for the safety-net consequences of ratings mistakes away from themselves.

Clearly, CROs must be made more accountable for the quality of ratings they provide. Individual CROs can only recover the damage their brand has suffered by taking responsibility for their mistakes. For securitized claims, this could be done by requiring CROs to publish an *ex ante* margin for error with each credit rating and to publish the data used in establishing complex claims so that outsiders can fact-check their inputs and challenge and improve the modeling. This provides a nonbureaucratic way to subject ratings decisions to effective independent review (compare Goodhart 2008a).
Reform of Basel II. Because credit ratings and sophisticated risk-management models have been discredited, it is clear that Basel II must be reworked significantly. Some have suggested that the Basel Committee acknowledge that risk-management standards have changed so much that it is necessary to move directly to a new agreement: Basel III. Ideally, pillar two of the new system would include a simple leverage requirement and PCA rules for structured early intervention into the operations of loss-making financial institutions. This would further enhance supervisory and regulatory accountability. Framers of the new accord should find ways to use market signals from CDS and subordinated-debt markets to estimate and disclose how regulatory decisions in different countries affect safety-net costs in other countries.

We think that the Basel Committee’s drive to set ever more sophisticated ways to set risk-weights is a mistake, as revealed in the current crisis. Instead, they should abandon this task and adopt simple maximum leverage ratios, which include all on- and off-balance-sheet items. Developing country authorities would have a simple system that they could implement easily, and they may want to proceed to this model on their own if Basel tarries. Accordingly authorities should pay much less attention to the parts of Basel II that rely on credit ratings and models.

Reform of Government Accountability. For individual countries, systemic crises are infrequent events. This means that incumbent policymakers seldom have direct experience in working through the crisis-driven stresses generated by lobbyists for insolvent institutions. While improvisation works for well-practiced jazz musicians, the current crisis amply illustrates that, in crisis management, it deteriorates into methods of wholesale financial-institution rescue. Crisis-management decisions are full of errors because they are made in stressful circumstances by unpracticed policymakers who feel that their career in government service is on the line (Kane and Klingebiel 2004). While even high-income-country policymakers make mistakes, developing country authorities often have less skilled staff on which they can rely, due not just to a skill issue in the country but also by compensation differentials when compared with the private financial sector. Where skills are scarce, advanced planning is even more important. Decisions about which institutions to rescue and how to save them tend to follow the path of least resistance. This invariably entails bailing out deeply insolvent institutions and extending the dimensions of the safety net in a way that, by further subsidizing risk-taking, sow the seeds of future crises.

To avoid short-termism, crisis-management decisions should be made in an open debate outside of an actual crisis. Accountability would be improved by requiring that regulators establish and regularly test a well-publicized benchmark plan for crisis resolution. The events of the current crisis confirm that not
planning for crises prolongs and deepens the disruption by tempting regulators to subsidize loss-making institutions at taxpayer expense. The damage a crisis works on a country’s financial sector and its real economy can be reduced by taking actions that promptly estimate and allocate losses during the early stages of a crisis. The critical first step is to allow time for forensic accountants to separate the hopelessly insolvent institutions from potentially viable ones. Authorities need such information to deal with insolvencies in ways that protect taxpayers and avoid subsidizing further risk-taking.

In and out of crisis, regulators need to draw on market signals to help them to track risk. A promising way to do this is to require at least the largest banks to issue at regular intervals a series of CDS to issue large amounts of credibly uninsured subordinated debt, or both. Transactions prices for these instruments can be incorporated into information systems that the supervisors can use to improve their assessments of safety-net loss exposures. This is because holders of these instruments would apply the market discipline that pillar three of Basel II seeks to harness.

Most importantly it is necessary to strengthen the safety net by making authorities more accountable for its costs. Interactions between large banks and supervisory agencies could be made more transparent if both were required to estimate and to disclose the amount of these subsidies on their books. This requires the development of a system of fair-value accounting for intangible safety-net subsidies. If the probability of bailouts can be reduced, regulators can use CDS prices to estimate individual-institution and aggregate values of safety-net subsidies (Kane 2008). For example the spread at which CDS trade can be used to strip out the value of the safety net subsidies imbedded in that firm’s market capitalization.

In government enterprises, decision-making horizons could be lengthened if employment contracts included a fund of deferred compensation that heads of supervisory agencies would have to forfeit if a crisis occurred within three or four years of leaving their office (Kane 2002). Calomiris and Kahn (1996) show that such a system worked well in the 19th century Suffolk banking system, where claims to deferred bonuses were paid only after losses had been deducted. The public embarrassment of having to forfeit compensation, in addition to the financial penalty, would incentivize top supervisors to use market signals more efficiently and help them to resist political pressure to bail out insolvent firms. The less transparent a country, and the greater the degree of corruption, the more it needs to worry about the financial incentives facing financial sector regulators.

None of these accountability enhancements—better crisis preparedness, greater use of market information to track risks and subsidies, publicizing estimates of safety-net subsidies, or offering deferred compensation—would be costly to implement. Yet current and past crises suggest that the return to implementing them would be enormous.
Lastly, developing countries need to continue to build the infrastructure that a modern financial system requires, most importantly a good information environment led by sound accounting and auditing, efficient contract enforcement, and clear incentives. As noted above, improving the information and incentive environment needs to be a continuous effort, as financial sector players in rich and poor countries alike regularly contrive to conceal risk-taking. With weaker checks and balances in government, often critical shortages of supervisory skills, and a generally less independent media, financial sector oversight is more prone to breakdowns in poorer countries. Although the specific methods of avoiding regulation that were part of structured securitization were more confined to high income countries, the general lessons on regulatory arbitrage and the need for continued supervisory vigilance are common to all. Developing country authorities can let industrialized countries experiment with new instruments but they need to ignore pressures to adopt the latest regulatory and product innovations until they have been amply tested.

Notes

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1. From 1999 to 2007 the only significant financial crisis occurred in Argentina, a country that has experienced numerous crises throughout its history. This crisis had major consequences for only a single neighboring country (Uruguay).


3. Recently one investment bank sold some of its super-senior holdings for only 22 cents on the dollar, and at least one critic claimed that their true value was closer to zero (Roubini 2008).

4. The value of subprime mortgages originated in the United States shot up from $190 billion in 2001 to $600 billion in 2006. Much of this growth was fueled by securitization: as a percentage of subprime mortgage originsations, the volume of subprime issuance rose from 50 to 80 percent over the same interval (Economist May, 2008).

5. The report by the Federal Reserve Bank of Boston (2003), “Closing the Gap: A Guide to Equal Opportunity Lending”, contains a variety of statements urging banks to make every effort to facilitate such lending, such as by being aggressive on lending standards, appraisals, and loan to income ratios (pp. 22–6).

6. Also see Keys and others (2010) for consistent results.

8. Prior to World War I, corporate default rates were significant and ratings agencies did seem to supply some modest function, though even the most authoritative study (Hickman, cited in Sylla, 2001) fails to lay to rest the critique that ratings might at most have been modestly anticipating declines in performance and did not do demonstrably better than market indicators. In the post-World War II period through the early 1970s, the default rate on corporate bonds declined to only about 1% percent, so ratings were not critical to investors' decisions.

9. If a corporation that has issued a bond gets into trouble, it can make a variety of adjustments that will enable its bond to perform in line with ratings. A fixed pool of securities cannot adjust; it remains a claim on cashflows from a variety of sources.

10. It is interesting to speculate on how many fund managers would have successfully defended their position with the claim that they did not know what they were investing in (but neither did their competitors) or that they knowingly invested in pools of high-risk mortgages confident that housing prices would rise endlessly.

11. The Basel Committee, created by the G-10 central banks in 1974, now includes Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. The Committee itself notes that Basel II arose in response to the growth of securitization, giving the impression that this growth was an exogenous development rather than at least in part a response to Basel I and its "loan-by-loan" approach to assessing a firm's overall risk exposure.

12. The Committee continues to regard subordinated debt as inferior to shareholder equity, but only because such debt is limited in its maturity. This neglects the better incentives that debt establishes in monitoring risk. Whereas equity value varies directly with the returns promised from increasing risk, debtholders' returns can be harmed by increasing risk. This leads first-loss debtholders to exert a more conservative influence on corporate governance than equity holders.

13. The IRB Approach has two variants: Foundation and Advanced. Under the Foundation Approach, instead of relying on external assessments of creditworthiness, banks are able to use their own estimates of probabilities of default for each borrower. These borrower-specific factors, supplied by each bank, are then combined with supervisory-determined estimates of loss given default, exposure at default, and effective maturities to arrive at regulatory risk weights. If a bank satisfies the stricter eligibility conditions to qualify for using the Advanced Approach, then it can place even greater reliance on internal credit systems by using not only their estimates of the probability of default but also their own estimates of loss given default, exposure at default, and effective maturities.

14. Under pillar one, Basel II combines the evaluation of capital adequacy for credit risk, operational risk (defined as the risk of loss resulting from inadequate or failed internal processes, people, and systems, or from external events), and market risk (defined as the risk of losses in on- and off-balance-sheet positions arising from market movements in interest rates, foreign exchange, and securities or derivatives prices) with incentives for banks to invest in better risk management processes to qualify for the discretion allowed under each more-advanced approach. Interest-rate risk in the banking book is relegated to the supervisory review process of pillar two.

15. Early bubbles occurred before safety nets commonly were extended to the financial sector. During the South Sea bubble, John Martin famously said: "When the rest of the world are mad, we must imitate them in some measure." The size of the equilibrium "measure" is what the safety net influences. Unlike modern securities firms and commercial banks, Martin could not have hoped that the government would rescue his bank, since the Bank of England had not at that time begun to operate as a central bank.

16. Costs of resolving crises has risen significantly over time: in the late 19th and early 20th century, they ran at about 2 percent of GDP; in modern times they have averaged five to six times this figure, with some cases reaching the range of 20 to 50 percent of GDP.
17. Examples of deregulation with little supervision include Malaysia in the 1970s—which featured a buildup of real estate exposures to 50 percent of bank lending—and the U.S. Savings and Loans, which were allowed to gamble in high risk investments even after they were insolvent.

18. The crises studied occurred in: Argentina, 2001; Ecuador, 1998; Finland, 1991; Indonesia, 1997; Japan, 1991; Korea, 1997; Malaysia, 1997; Mexico, 1994; Russia, 1998; Sweden, 1991; Thailand, 1997; and Turkey, 2000. Only Sweden refused to supply extensive liquidity support to insolvent institutions.

19. As Calomiris (1997) and Evanoff and Wall (2001) explain, expectations of implicit support would contaminate the signal.

References

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other key staple foods also rose sharply in 2008. The price increases for cassava (161 percent), matooke (54 percent), and sweet potato (44 percent) were particularly steep in Northern Uganda, and as a result households in this area were worst affected. Moreover, since Northern Uganda had the largest concentration of the poor to start with, this increase in food prices is likely to have worsened regional inequalities.

The fact that the distributional impact of rising food prices affects poor households partly based on where they live is also clearly illustrated by recent work on Mozambique. Arndt and others (2008) using simulations based on nationally representative data show that urban households and those who live in the south of the country are adversely affected by rising food prices, while those in the north and center of the country, especially better-off farmers, typically benefited.

Prior to concluding our review of poverty impacts it is worth emphasizing two points. First, we focused our discussion on the impact on consumption poverty mirroring the focus of recent analytical work on the food price spike. Yet the impact on worsening malnutrition, school drop-outs, and adverse gender consequences of households struggling to access sufficient food is just as, if not more, important, as the early evidence from Liberia and Sierra Leone show.

Second, as has been shown, impacts differ substantially between geographical areas within a country, which poses a dilemma for policymakers. On the one hand, the desire to help households cope with the increase in food prices may lead policymakers to implement or expand safety net interventions in the hardest hit areas. On the other hand, these hard-hit areas may not necessarily be among the poorest in the country. Hence, the effectiveness of the country’s overall poverty reduction strategy may be jeopardized if public resources are diverted from the poorest areas to less poor areas to address the food crisis, and trade-offs between immediate responses and medium-term measures to reduce chronic poverty may emerge.

Policy Responses to Rising Food Prices in Sub-Saharan Africa

In this section we review the results of a survey on the policy responses to the sharp rise in food prices in 2008 before examining two specific instruments—lowering foodgrain taxes and expanding food-based safety nets—in more depth.

Policies in Surveyed Countries

Countries vary widely in the type of policies or programs they are able to introduce, or scale-up, to respond to rising commodity prices. As discussed earlier there are essentially three broad types of policies that are used to respond to a
sharp rise in food prices. The first set includes policies which attempt to stabilize rising prices by affecting the aggregate supply and demand balance. These include reducing taxes on foodgrains (import tariffs and sales taxes), using food grain stocks to increase supply, using some form of subsidy on essential items, and imposing export restrictions on staple food items.

A survey of 120 country teams carried out by the World Bank in March, 2008 shows that in Sub-Saharan Africa the most common ‘economy-wide’ policy response was to reduce foodgrain taxes—either tariffs, VAT, other sales tax, or a combination of these measures. On the other hand, the most common response outside Sub-Saharan Africa was some form of subsidy on essential items, which is what over half of these countries used to stabilize domestic prices (see figure 1). These subsidies have a long history in several countries and vary significantly in the extent to which they create distortions and generate fiscal pressures. For instance in Eastern Europe formal or tacit agreements between producers and the government on either actual prices or profit margins are common for basic staples. These restrictions can create producer disincentives. In the Middle East and North Africa, universal subsidies on key items are an important part of the social compact between the State and the citizens in several countries. These are known to be fiscally expensive and crowd out spending on other social programs. In South Asia, several countries have targeted subsidies on “inferior goods” (for example coarse rice in Bangladesh) which are used during crises and typically create the fewest distortions. Only 30 percent of Sub-Saharan African countries used some form of subsidy. This lower share is most likely due to the greater fiscal and administrative constraints in Africa relative to non-African countries. In some ways these constraints are a blessing in disguise for Sub-Saharan Africa—widespread use of these subsidies makes them difficult to remove, reduces the

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**Figure 1.** Economy-wide Policy Responses to Rising Food Prices

![Figure 1](image-url)
incentives for the development of alternative, better-targeted safety net programs, and can risk curbing an agricultural supply response.

Around a third of countries in Sub-Saharan Africa used foodgrain stocks to increase domestic supply and curb prices—this ratio is similar to the global average. The transportation, storage, and rotation of physical stocks require considerable expertise and these strategic grain reserves have had their share of corruption problems. Yet the pressures arising from the virtual suspension of rational pricing mechanisms on global foodgrain markets in early 2008, with consequent knock-on impacts in local markets, has led to a renewed interest in building up physical reserves, which can then be released during crises.

Export restrictions were as common outside Sub-Saharan Africa (23 percent of countries) as they were for countries within Africa. Governments typically introduce such measures due to pressures from the domestic political economy, though it is unclear whether these measures have any impact on domestic prices. What is clear is that when these are imposed by large grain exporting countries they have serious food security implications for neighboring countries and for regional commodity markets.

The second broad type of policy response revolves around using existing safety net instruments to either increase benefit levels or increase beneficiary coverage. However, while many countries in Sub-Saharan Africa have food-based transfer programs (figure 2), the coverage of these programs tends to be small (in part due to lack of financing), relative to needs. In Burundi, Central African Republic, Ghana, Liberia, and Togo school feeding programs were expanded, while in Guinea and Sierra Leone public works programs were set up. As Figure 2 shows from survey responses by World Bank country teams in March, 2008, some countries in Sub-Saharan Africa have cash based programs. For example, Ethiopia was able to respond by expanding the benefit levels of its major cash transfer

**Figure 2. The Distribution of Safety Net Programs**

![Graph showing the distribution of safety net programs.](image-url)

The World Bank Research Observer, vol. 25, no. 1 (February 2010)
program. Informal networks and family based support mechanisms are an important part of the safety net, though these were strained during the food price spike. The ability to scale up safety net programs during these crises is limited by both fiscal constraints—worsened by economy-wide measures such as reducing taxes or increasing subsidies—and capacity constraints. These include weaknesses in targeting vulnerable groups as well as food and cash management issues. Yet given the range and frequency of shocks in Sub-Saharan Africa strategic choices will need to be made so that the fiscal space and requisite capacity for scaled up safety nets is created.

The third type of policy measure involves supporting domestic food production, though impacts here typically accrue over the medium term. Scaling up or introducing free or subsidized input distribution (for example Malawi), or the government import of fertilizers (for example Ethiopia and Tanzania), are common short-term responses, though they often have significant fiscal consequences. Over the medium run African countries, through the New Partnership for Africa’s Development (NEPAD) mechanism, have committed to increasing their investments on agricultural research and extension as well as on irrigation and new technology.

In practice countries combined economy-wide policies and safety net programs as their immediate response to the food price hike. Country examples are illustrative of this mix. Liberia’s response revolved around reducing import taxes on food-grains and scaling up targeted feeding programs. Kenya imported 3 million metric tons of maize and subsidized fertilizer. Guinea introduced a targeted consumer subsidy for rice and expanded an existing school feeding program to urban areas. Cameroon sharply reduced VAT and customs duties on basic food staples as well as on imports of agricultural inputs while raising civil service wages. There are no studies which examine the cumulative effectiveness of these policies. We therefore limit ourselves to reviewing recent work on the extent to which the poor are likely to be targeted by two types of policy—indirect tax cuts and food-based safety nets—which are commonly used in Sub-Saharan Africa.

**Economy-Wide Policies: The Case of Indirect Tax Cuts**

As figure 1 illustrates almost half of the governments in Sub-Saharan Africa have reduced taxes levied on food items, such as import taxes and VATs, in order to deal with the increase in food prices. An IMF survey shows that most of these cuts were in import tariffs as they were easier to administer than VAT (IMF 2008). Wodon and others (2008b) estimate the extent to which the poor are likely to benefit from a reduction in indirect taxes. The authors provide data on the consumption of various imported foods for the same set of West and Central African countries discussed earlier. The share of rice consumption in the bottom
40 percent of the population varies from 11 percent in Mali to 32 percent in Sierra Leone, averaging around 20 percent. This means that if one considers the bottom 40 percent as the poor, out of every dollar spent by a government for reducing indirect taxes on rice, and assuming that the indirect tax cuts results in a proportionate reduction in consumer prices, only about 20 cents will benefit the poor on average. From the consumer perspective the extent of the benefit will clearly also depend on the extent of initial tariffs and the magnitude of the tariff cut. In West Africa most import tariffs on food staples were below 15 percent. For most of the other imported foods for which indirect tax cuts were implemented, the proportions of those foods consumed by the poor tend to be even lower than that for rice. If we therefore assume that the share of imported foods represented at most 10 percent of average household consumption then the real income gain even from a complete elimination of tariffs would be no more than 1.5 percent.

Thus, while reducing taxes is a popular “stroke of the pen” measure, it suffers from several weaknesses. First, it can be costly in budgetary terms if these are permanent cuts. For instance the reduction in taxes following the rise in food prices was as much as 1.1 percent of GDP in Liberia and 0.8 percent in Senegal, and equivalent to 7 percent of tax revenues in Guinea Bissau, worsening an already tight fiscal balance. Second, for many food items, much of the benefit of the tax cuts will accrue to the nonpoor and the real income gains for the poor will be marginal. Third, compared to reducing VAT or a sales tax, lowering import tariffs may well hurt domestic producers in the short run, and in some circumstances reducing import tariffs may increase poverty. Hence the decision to reduce tariffs would need to balance the benefits for the poor in terms of the reduction in retail prices and political economy gains, with the costs outlined here.

**Food-Based Safety Net Programs**

As figure 2 shows food-based safety net programs are more common in Sub-Saharan Africa compared with other regions. In this section, we focus on the targeting performance of three types of food-based safety nets—food aid as typically distributed by humanitarian agencies, school feeding programs, and public works which often make payments in kind (but may also provide cash benefits).

Using nationally representative household survey data a recent assessment of a World Food Programme (WFP) feeding programme in Burundi shows that there was little difference in the likelihood of receiving food aid between various groups of households (Diang’a, Wodon, and Zoyem 2009). The share of total food distribution obtained by the poor was in fact slightly lower than the share of the poor in the total population. The main shortcoming appeared to be that this program did not specifically target areas in the north where food insecurity was most
severe—which WFP now does. Clearly, using poverty maps is important for making the most out of scarce resources.

Analysis from a 2007 nationally representative household survey in Liberia shows that 22 percent of the population received some form of food aid. School feeding was the most common (74 percent were recipients of food aid), followed by food-based public works projects and nutritional supplementation. Similar to Burundi, estimates of the targeting performance of these programs suggest that nonpoor households are essentially as likely to benefit from food aid as poor households. There are differences in targeting estimates across programs (school feeding programs are slightly pro-poor, while other programs are slightly in favor of the nonpoor), but these differences are not large (Tsimpo and Wodon 2008b). Gilligan and Hoddinott (2007), using longitudinal data from Ethiopia, compare the targeting and food security outcomes of a feeding program and a Food for Work program. They find that the feeding program was better targeted to the extreme poor, while the benefits from the public works program accrued mainly to the middle and upper end of the distribution.

Del Ninno, Dorosh, and Subbarao (2007) review the experience with food aid in two East African countries (Ethiopia and Zambia) and two South Asian countries (India and Bangladesh). Their results suggest that to be effective food aid needs to be timed to avoid local producer disincentive effects and be channeled in a manner which helps create local level infrastructure—all characteristics of a well-functioning public works program. The drawback with such programs is that participants have to give up other employment in order to participate in these programs, and hence they are more suitable for shocks, or lean seasons, which create unemployment. Adato and Haddad (2002) find that among a sample of public works projects in South Africa, about 90 percent outperformed an untargeted transfer scheme. Teklu and Asefa (1997, 1999) find that in rural Botswana and Kenya, the poor are more likely to participate in public works programs than the nonpoor and have a substantial positive impact on their income. At the same time, a substantial number of nonpoor individuals also participate in the schemes, so that targeting performance could be improved.

Using data from Chad, Ghana, Liberia, and Rwanda Wodon and others (2008c) define the overall leakage rate in public works programs as the share of program outlays that are likely not to raise the incomes of the poor, either because program participants are not poor or because of the income foregone from alternative employment. The authors show that if public works programs are randomly placed within the country, the leakage rates are potentially high, varying from 50 percent to close to 75 percent in all four countries. On the other hand, if the programs are geographically targeted, targeting performance can improve substantially. In Ghana, for example, the simulated leakage rate for a hypothetical randomly placed public works program is very high, at 73 percent.
while it could be as low as 18 percent if resources were only concentrated in the
Upper West region of the country.

This review shows that the food-based safety net programs more commonly used in Sub-Saharan Africa can be effectively targeted to the poor with clear benefits to household welfare, but that there is considerable variation across programs and contexts. The choice of program depends on a range of factors, such as the type and duration of the shock being faced by the community, the administrative capacity, and budgetary constraints. School feeding programs may be particularly effective for retaining poor children in school following a real income shock such as a sharp increase in food prices. Public works programs may be more effective during lean seasons or following lay-offs during an economic downturn. Timing is also crucial. For instance administrative structures need to be in place to enable interventions during the lean seasons, thereby avoiding households having to consume their seeds and selling their assets. In many countries, given large differences in consumption and nutrition levels between regions, geographic targeting could be used to improve program effectiveness. Furthermore, in order to address chronic food insecurity for vulnerable groups, regular fortified food provision, and other essential nutritional interventions aimed at reaching children under five and pregnant mothers, are required year-round.

Conclusion

The first objective of this article was to review the evidence regarding the potential impact of the recent increase in food prices on poverty focusing on Sub-Saharan African countries. The second objective was to document the policy responses adopted by governments to cushion the poor from the immediate impacts of this crisis, and to assess the extent to which the poor may have been reached by these policies. Two main findings stand out from our review.

First, due to the higher share of net consumers relative to net producers in most countries, higher food prices leads to increased poverty even when second-round wage effects are taken into account. The bulk of the welfare loss from higher prices accrues to those who are already poor, and the evidence from Sub-Saharan Africa shows that increases in the poverty gap can be significant. Recent analysis in Sierra Leone and Liberia, albeit using nonrepresentative samples, shows that households cut back on rice consumption and significant numbers cut back their consumption of micronutrient rich foods. The poorest families reported sending fewer children to school and avoiding hospitals. Hence even if these price increases were temporary—and it is unclear to what extent this is the case—these price shocks can have long-lasting impacts.
Second, governments potentially have various tools at their disposal to deal with the immediate impact of the increase in food prices, with important differences in the effectiveness of these tools. The types of policies which are used to deal with crises vary considerably across continents. In Eastern Europe and the Middle East for instance there is a long history of universal subsidies and controls on producer prices. These policies clearly have significant fiscal costs and require a fairly extensive state apparatus to implement, which may partly explain why these instruments are less common in Sub-Saharan Africa. On the other hand, targeted subsidies (using products typically consumed by the poorest) deployed during sudden shocks, or lean seasons, can be an effective way to protect the poor while not creating excessive fiscal costs or economic distortions. In Sub-Saharan Africa, almost half the countries surveyed following the increase in food prices reduced taxes on foodgrains. We argue that the bulk of the benefits from a cut in tariffs accrued to the nonpoor, and the paltry real income gains for the poor, are most likely not worth the tax revenue foregone.

In addition to economy-wide policies, governments have scaled up safety net programs in an effort to cushion the poor from the impact of higher food prices. Safety net programs tend to be better targeted than economy-wide policies, though our review suggests that they can also suffer from significant leakages to the nonpoor and face fiscal and administrative constraints. The limited evidence available on feeding and public works programs suggests that their targeting performance can be improved considerably, for instance through the use of geographic targeting. Moreover in most Sub-Saharan African countries the coverage and generosity of safety net programs falls significantly short of the size and needs of their vulnerable populations.

Hence it is clear that in practice most governments in Sub-Saharan Africa have limited instruments to address events such as the 2008 spike in food prices and yet there are strong political pressures for them to do so. Given the absence of well-targeted safety nets with adequate coverage in many countries, it could be that some of the "economy-wide" measures that were adopted by governments were necessary both for reasons of political economy as well as for practical reasons. Moreover some of these economy-wide options are less costly than others, and time-bound and targeted subsidies, for instance, may be as cost effective as any other alternative policy option to protect the poor. Yet experience from other countries shows that investments in the building blocks of safety net programs could yield tangible improvements in the lives of a large proportion of poor households at the time of the next crisis. Specifically, investments in targeting methods and data, payment systems, accountability mechanisms, and monitoring are required (see Grosh and others 2008 for more details). These can create the basis for a safety net menu which includes regular year-round programs for vulnerable groups (for example infants, pregnant women, the disabled) as well as
temporary programs which scale up during lean seasons or during shocks. Finally, although medium to long term initiatives to boost food production have not been discussed here, these initiatives are clearly necessary as part of an overall package of policies to stimulate pro-poor growth and reduce household vulnerability to shocks.

Notes

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1. Ivanic and Martin also show that the effect of a relatively small 10 percent change in prices can be a first-order approximation for the impact of a larger change, though some results vary significantly depending on the extent of the clustering of households around the poverty line. In rural Peru, for instance, the impact of a 20 percent price rise on the poverty headcount is five times greater than that of a 10 percent rise.

2. For more detailed country studies, see for example Joseph and Wodon (2008) on Mali; Wodon, Tsimpo, and Coulombe (2008) on Ghana; and Tsimpo and Wodon (2008a) on Liberia.

3. Field interviews in 2008 revealed that due to the sharp erosion in purchasing power due to high inflation, the vast majority of participants in the Productive Safety Net Program would have preferred in-kind payments instead of the cash transfer (Hobson 2009).

References

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