

**EXOGENOUS SHOCKS IN LOW INCOME COUNTRIES:  
ECONOMIC POLICY ISSUES AND  
THE ROLE OF THE INTERNATIONAL COMMUNITY**

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## EXECUTIVE SUMMARY

- 1. Economic volatility is a fact of life, especially in low-income countries.** This volatility stems from various sources – some of which can be considered exogenous, such as commodity price changes, natural disasters, the sudden withdrawal of aid, the imposition of trade barriers in partner countries, or externalities that result from conflict in a neighboring country. Exogenous shocks are an extreme form of volatility, and their negative impact on low-income countries appears to have increased in magnitude and frequency over time.
- 2. Low-income countries, especially the poorest, are disproportionately affected by exogenous shocks.** The frequency and severity of shocks are higher and shocks are closely correlated with growth. Terms of trade shocks explain as much of the variance in growth rates as do country policies. The effect of shocks on growth is asymmetric and positive shocks do not offset negative ones partly because negative shocks have irreversible effects. Negative shocks have important effects on households and on the economy, and very often lead to increases in poverty.
- 3. These countries lack external cushions (such as large foreign exchange reserves) and internal stabilizers (such as well-developed credit and risk markets) to protect against shocks.** In the absence of stabilizing mechanisms, an input shock, such as a drought, translates very quickly into an output shock and a fall in consumption. Since adequate social safety nets are usually lacking, the poor are hurt disproportionately, often being forced to sell their meagre assets to smooth consumption. And policy distortions often amplify these economic effects.
- 4. While the global community has assisted low income countries in preventing and mitigating the effects of exogenous shocks, most of this assistance has been largely ad-hoc.** Some financial instruments do allow low income countries to draw resources automatically in the event of shocks. But there is no clear mechanism by which donors and creditors can supplement country efforts to deal with exogenous shocks in a timely, objective manner, and on appropriately concessional terms. Often, low-income countries, many of which are already significantly indebted, resort to borrowing to tide them over exogenous shocks. This usually increases their indebtedness further and raises the risk of future debt distress.
- 5. Going forward, a three-pronged strategy is considered to effectively address exogenous shocks in low-income countries.** First, it is important that countries take preventive measures and build adequate cushions to protect against exogenous shocks. This includes building adequate foreign exchange reserves and developing efficient domestic financial and risk markets. Second, countries, in partnership with donors and creditors, need to develop adequate strategies to cope and finance shocks, including social safety nets to ensure that the most vulnerable are protected in the aftermath of a shock. This includes preparing effective schemes for transferring resources targeted to affected groups in the country, which can be quickly activated and expanded when shocks occur. Third, there is a need to consider stronger coordinating mechanisms across multilateral and bilateral creditor and donor agencies, which would facilitate a more effective global response to exogenous shocks that is concerted, adequate, and on appropriately concessional terms. Such an architecture may imply, among other things, that bilateral donors, who have so far focused more on projects and technical assistance, may need to consider allocating part of their assistance to deal with unforeseen contingencies.

## I. INTRODUCTION

1. **Developing countries are subject to a wide variety of exogenous disturbances — natural disasters (including droughts and floods); commodity price fluctuations, war or civil unrest in neighbouring countries; or volatility in the world economy that affects trade and financial flows.** The amplitude and frequency of these shocks tend to be particularly high in low income countries, increasing risk and uncertainty for households, investors, and governments, and, when sufficiently large, setting back progress already achieved. How well these economies deal with volatility depends on a range of factors, including the quality of their institutions, the depth and diversification of their economic and financial systems, and their ability to adjust rapidly to changes in circumstances. Unsurprisingly, low income countries often do not score well on these characteristics. For them, even minor shocks can sometimes be difficult to manage, and large shocks can be crippling.

2. **The paper examines the magnitude, frequency, and effects of exogenous shocks in low income countries and asks what is being done to deal with them — by the countries themselves as well as by the global community, including the World Bank.** The term “shocks” (in this paper) is applied to events that lead to unusually large volatility in key economic indicators of importance to low income countries.<sup>1</sup> It does not refer to the secular decline in the terms of trade but rather to volatility around a price trend. The term “exogenous” excludes shocks arising from policy choices, internal political instability, and internal conflict.

3. **The paper focuses on shocks arising from natural disasters and sudden changes in the terms of trade, in part because data is relatively plentiful and there is a significant body of available analysis to draw upon.** Other sources of shocks—for example, civil conflicts in neighboring countries, or a sudden change in the aid and trade policy environment—will need to be the focus of future data collection and research. While such shocks, when they occur, do affect foreign exchange inflows, there is little empirical work that assesses their relative importance.<sup>2</sup>

4. **The paper concludes that shocks in low income countries are of greater magnitude and frequency than in other developing countries as a whole.** Moreover, their magnitude and frequency have not been declining, and indeed in some cases, may even have been rising. Unfortunately, the duration of shocks tends to be large, and their initial impact is often magnified through fiscal and monetary policies.

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<sup>1</sup> The broader issue of volatility itself is the focus of a new report published by the World Bank. See Aizenman, Joshua and Brian Pinto (eds.), 2004, *Managing Volatility: A Practitioner's Guide* (Washington D.C.: World Bank), forthcoming

<sup>2</sup> Aid volatility and predictability has been the subject of a few empirical studies with some mixed results. Ales Bulir and Javier Hamman, in *Aid Volatility: An Empirical Assessment* (2003), IMF, find that aid is more volatile than revenues and that shortfalls in aid tend to coincide with shortfalls in domestic revenue. Their study also points to the problem of lack of predictability of aid relative to overall commitments by donors, particularly in low income countries, and the resulting need for quick fiscal measures to compensate for unexpected shortfalls in aid. In contrast, a 1999 paper by Paul Collier *Aid Dependency: A Critique* Journal of African Economies, finds that in 36 African IDA recipient countries aid was more reliable than revenue, and that aid acts as a buffer to revenue shocks.

5. **The paper also concludes that dealing with shocks is difficult in low income countries**, because more often than not, the resources, instruments, or policy options needed to manage or mitigate shocks are often unavailable or difficult to implement in a weak institutional and policy environment. Global assistance in response to exogenous shocks has been primarily ad-hoc in nature.<sup>3</sup> Few instruments are available to help deal with terms of trade shocks—specifically commodity price shocks. More importantly, when shocks occur, there does not exist an effective global mechanism that provides assistance to low-income countries in a timely, coordinated manner, on appropriately concessional terms.

6. **The World Bank and its development partners can play an important role in developing such a mechanism by catalyzing financial support for low-income countries to mitigate the impact of shocks.** The World Bank and other international financial institutions also need to evaluate to what extent current financing instruments are adequate and can be quickly used to provide the counter-cyclical resources needed to help mitigate the impact of shocks. At the World Bank, an evaluation is ongoing as to whether new concessional financing instruments tailored for this purpose are feasible.

7. **The rest of this paper is structured as follows.** The second section describes the extent of shocks to low income countries and the channels through which shocks affect economic well-being. The third section examines policy options available for countries to address shocks, and highlights the assistance provided by the international community, including the World Bank. The fourth section outlines a proposed future work program within the World Bank on this important issue. The fifth section concludes.

## II. SIZE AND IMPACT OF SHOCKS ON LOW INCOME COUNTRIES

### A. Defining a Shock is a Matter of Judgement

8. **There is no consistent definition of shocks.** This is because distinguishing shocks from volatility is largely a matter of degree. While volatility, or variability, refers to variation of a magnitude around some central trend,<sup>4</sup> shocks may be defined as a *significant* change in the value of a variable from its underlying trend, as determined using standard measures of dispersion such as the standard deviation or the coefficient of variation. Shocks may be classified as instances of extreme volatility, which, in statistical terms, fall in one of the tails of a distribution.<sup>5</sup> But what one terms “extreme volatility” is a matter of judgement. Consequently, the literature has used different definitions to identify volatility and shocks.

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<sup>3</sup> Evidence shows that assistance for large natural disasters has been more systematic.

<sup>4</sup> De Ferranti, D., G. Perry, I. Gill and L. Serven (2000). “*Securing Our Future in a Global Economy*”. World Bank.

<sup>5</sup> This distinction is not important in itself, but rather in policy implications for assistance, as will be argued later in this paper.

9. **An alternative definition of shocks is “a sudden event beyond the control of authorities that has a significant impact on the economy”.**<sup>6</sup> This alternative definition points to certain essential characteristics of shocks – a deviation from a “normal”, expected, trend that is unanticipated or exogenous, and results in significant effects on an economy, requiring adjustment and additional financing. This definition also raises questions. What types of shocks are purely exogenous? Should a drought that tends to occur in a country every three years on average be considered a shock? Similarly, what constitutes “significant impact” on the economy and what constitutes significant adjustment and financing in response to a shock?

10. **Different Types of Shocks can have different characteristics.** It is important to recognize that large shocks that occur suddenly, such as natural disasters (for example, earthquakes, hurricanes) can be quite different to shocks that unfold slowly (such as commodity prices, droughts). The former are relatively easier to identify, their duration can be determined with some accuracy and their size can be assessed with some confidence. Shocks that unfold slowly start unnoticed, and their impact is difficult to assess. Although this paper deals with both types of shocks, more of the discussion deals with shocks that unfold slowly

11. **It is also useful to differentiate between input and output (or consumption) shocks.** Input shocks identify the source of the disturbance to an economy, such as a terms of trade shock, or a natural disaster. An output shock identifies the impact measured as trend deviation in output or export earnings. (And, of course, consumption shocks measure the impact on trend deviation in consumption.) Input shocks get translated into output shocks through a transmission mechanism that essentially depends on the structure of the economy, the policy environment, and the quality of institutions. In some countries, input shocks are directly translated into output and consumption shocks, with little mitigation.<sup>7</sup> This is typically the case in low-income countries, which often neither have effective mechanisms to absorb the impact of input shocks, nor have access to risk diversification tools (for example, effective financial intermediation). Consequently, input, output and consumption shocks tend to be correlated in low-income countries.

## **B. Shocks In Low-Income Countries Are More Frequent And Persistent**

### **Commodity Shocks**

12. **Commodity prices are more volatile and more subject to shocks than are the prices of other tradable, industrial goods** (Table 1). Consequently, commodity dependent countries are more frequently exposed to large deteriorations in their current account, which may create broader distress across the rest of the economy.

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<sup>6</sup> See IMF (2003), “*Fund Assistance for Countries Facing Exogenous Shocks*”, SM/03/288.

<sup>7</sup> See Aizenman, J. et. al, op. cit.

**Table 1: Commodities And Industrial Goods: Price Volatility and the Size of Shocks  
(in percent)**

	Volatility	Size of large negative shock
<b>Commodities</b>		
Aluminium	15	21
Cotton	18	30
Coffee	26	31
Tea	17	22
<b>Industrial Goods</b>		
Machinery and Equipment	4	1
Lumber and wood products	7	4
Processed Foods and Products	4	2
Textile products and apparel	3	1

Notes: The table reports the volatility of the percent changes in prices (calculated as the standard deviation). A large negative shock is defined as one that can occur with a 5 percent probability. The size of the shock is the percent decline in the price. Data on commodity prices is from the World Bank. The prices of industrial goods correspond to the Producer Price Index reported by the U.S. Bureau of Labor Statistics.

Source: World Bank Staff estimates.

13. **Some commodities experience shocks more frequently than others** (Table 2). For example, cocoa price shocks occur once every 5.4 years on average while coffee price shocks occur once every 11 years.<sup>8</sup> The average size of shocks varies too. Negative shocks to coconut oil prices, for example, have averaged 64 percent, but for aluminium the average has been 22 percent.<sup>9</sup> Moreover, there is no clear relationship between frequency and size. Shocks are more frequent in beef than in jute, for example, but the average size of shocks is larger in the latter.

14. **Commodity price shocks tend to be persistent** (Table 3), with average half-lives typically in excess of five years.<sup>10</sup> But the duration of shocks on *export earnings* tends to vary considerably. About half the African countries experience short-lived terms of trade shocks, while one-third experience permanent terms of trade shocks.<sup>11</sup> This is because prices of unrelated commodities do not move together on world commodity markets, but prices of related

<sup>8</sup> A negative shock is defined as a change in the price by one standard deviation below the mean.

<sup>9</sup> The size of the shock is measured by the average size of the negative change in the price by more than one standard deviation below its mean.

<sup>10</sup> Cashin, Liang, and McDermott. 2000. *How persistent are shocks to world commodity prices?* IMF Staff Papers, Vol. 47, No. 2, pp. 177-217. "Half-life" is the time it takes for half of the effect of the shock to dissipate.

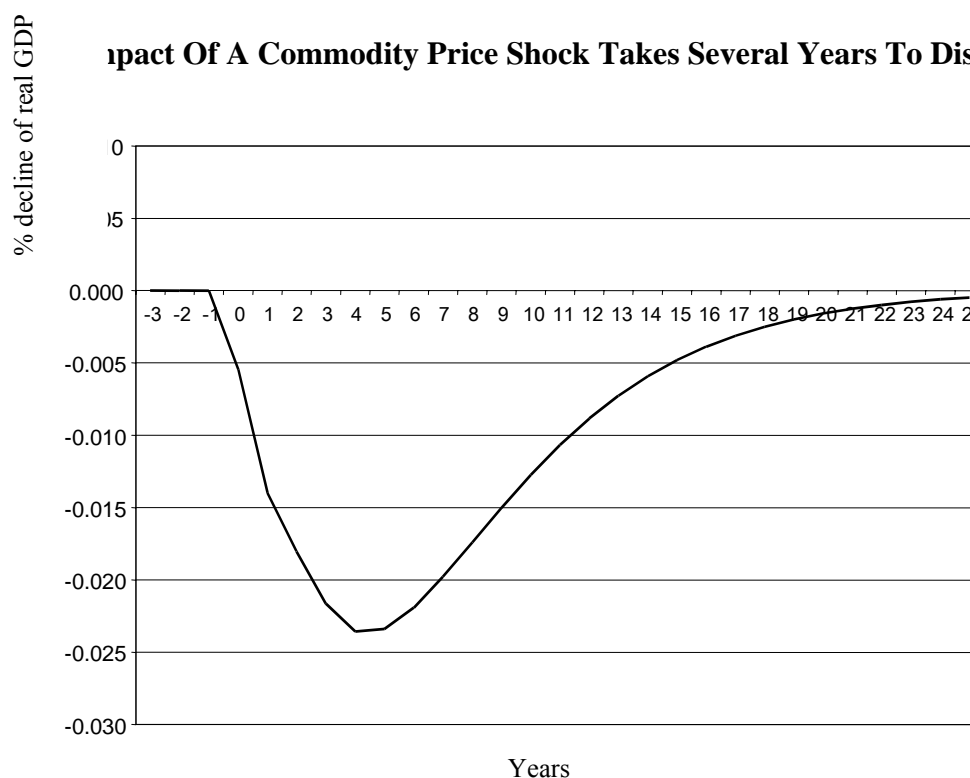
<sup>11</sup> Cashin and Patillo. 2000. *Terms of trade shocks in Africa: Are they short-lived or long-lived?*, IMF Working Paper 00/72.

commodities such as beverages (tea and coffee) and metals (copper and tin) are often synchronized.

15. **Preliminary analysis by staff reveals that the maximum effect of a commodity price shock is typically achieved only after about four years (Figure 1).** This is due, in part, to the persistence of commodity price fluctuations. However, even in the extreme case of a one time shock, the maximum effect is achieved, on average, after two years.

16. **It is difficult to tell ex-ante, whether a shock will persist, and for how long.** This hampers an appropriate policy response, especially the balance between adjustment and financing. Policymakers tend to opt toward financing shocks through external borrowing, even if on concessional terms; this has been an important factor contributing to debt distress in low income countries.<sup>12</sup>

**Figure 1** Impact Of A Commodity Price Shock Takes Several Years To Dissipate



Note. Figure shows the impact of a two standard deviation change of the country-specific commodity price index (Deaton Miller index) on real output (GDP) in a typical low-income country. The impact is the percent change in GDP for low income countries, on average.

Source: World Bank staff calculations

<sup>12</sup> Kraay, A. and Nehru, V. 2004. "When Is External Debt Sustainable?" World Bank Policy Research Working Paper No. 3200, January 2004.

17. **After 1973, commodity prices have become more volatile (Figure 2).** Consequently, low income countries have been exposed more frequently to large shocks in this period. In contrast to what is observed for other developing countries, this increased exposure of low

**Table 2: Frequency and Size of Commodity Shocks**

Commodity	Number of years between shocks a/	Average size of negative shocks b/	Commodity	Number of years between shocks a/	Average size of negative shocks b/
Cotton	7.2	28	Nickel	7.2	35
Aluminum	7.2	22	Orange	8.6	20
Banana US	10.8	27	Palm Oil	8.6	49
Beef	8.6	26	Phosphate Rock	43	63
Cocoa	5.4	32	Rice	10.8	44
Coconut Oil	6.1	64	Sawnwood		
Coffee	10.8	43	Meranti	6.1	17
Copper	8.6	35	Silver	7.2	33
Copra	5.4	57	Sisal East African	14.3	49
Crude Petroleum	14.3	47	Sorghum	8.6	25
Fish Meal	5.4	37	Soybean Oil	7.2	39
Gold	10.8	23	Soybeans	7.2	23
Groundnut Oil	8.6	44	Sugar	6.1	60
Iron Ore	6.1	15	Tea	14.3	38
Jute	10.8	49	Tin	14.3	47
Lead	6.1	32	Phosphate	21.5	66
Logs Meranti	7.2	27	Tobacco	8.6	19
Maize	6.1	24	Rubber	8.6	29
Natural Gas	8.6	22	Wheat	7.2	26
			Zinc	10.8	37

Notes:

a/ a shock is defined as a change in price by one or more standard deviation below the mean.

b/ percent change in prices

Source: WB Staff calculations based on World Bank commodity price data



**Table 3: Duration of Commodity Price Shocks: 1957–1998**

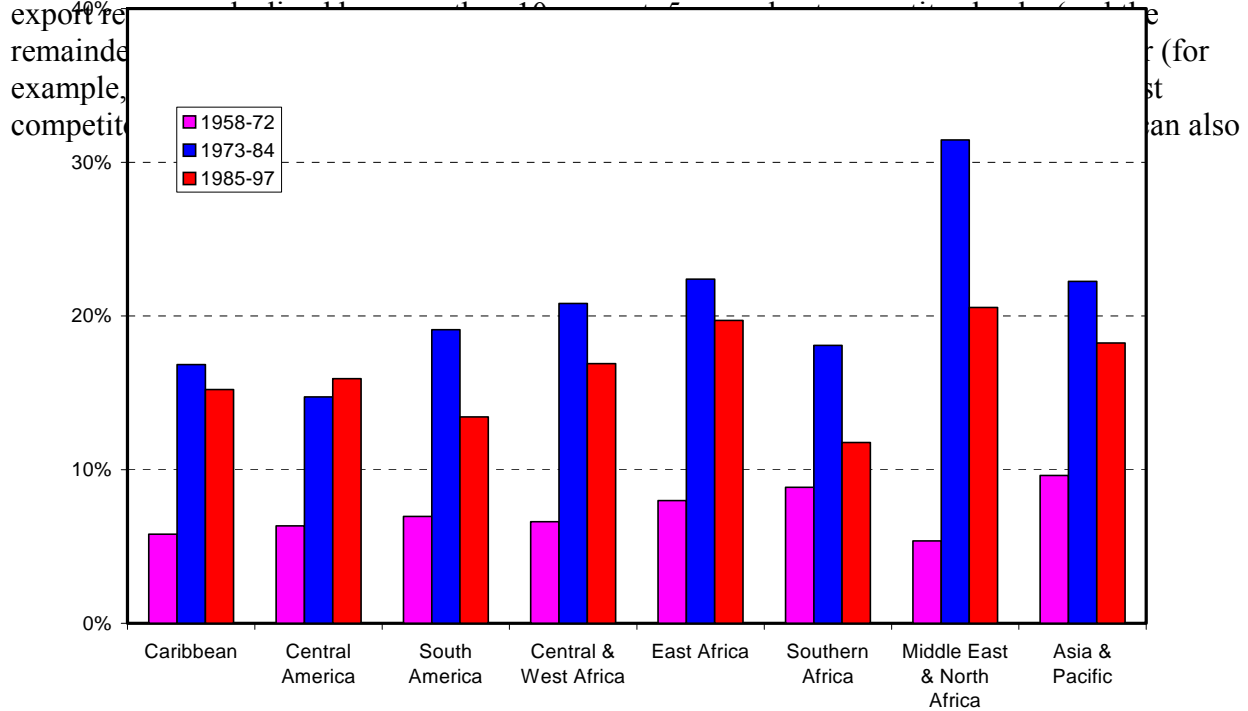
	Less than 12 months	12 to 28 months	48 to 96 months	96 to 216 months	Permanent			
Bananas	2(2-3)	Aluminum	29 (1 & up)	Beef	57, (20 & up)	Coffee	150, (26 & up)	Cocoa beans
Heating Oil	8, (4 & up)	Fishmeal	45, (18 & up)	Coconut oil	70, (22 & up)	Cotton	152, (26 & up)	Coffee (Robusta)
Hides	11, (7-23)	Gasoline	44, 8 & up)	Copper	81, (23 & up)	Nickel	175, (26 & up)	Gold
Softwood	11, (5 & up)	Iron Ore	32, (15 & up)	Groundnut oil	58, (20 & up)	Rice	103 (24 & up)	Hardwood (logs)
Sugar	7, (5-10)	Lamb	14, (9 & up)	Lead	64, (21 & up)			Natural gas
Tea	10, (7-21)	Rubber	43, (18 & up)	Maize	55, (20 & up)			Petroleum
		Soybean meal	26, (14 & up)	Palm oil	64, (21 & up)			Sawnwood
		Soybean	30, (15 & up)	Phosphate rock	49, (19 & up)			Tin
		Sugar (U.S.)	27, (14 & up)	Soybean oil	51, (0 & up)			Tobacco
		Wheat	44, (18 & up)	Wool (coarse)	70, (22 & up)			TSP
				Wool (fine)	57, (20 & up)			
				Zinc	94, (24 & up)			

Note: Estimated average duration (half-life) of price shocks (in months) is given by the first number in each relevant column and is followed by range of duration in parentheses.

Source: IMF Finance & Development (2001) “*Do Commodity Price Shocks Last Too Long for Stabilization Schemes to Work?*”

income countries to large price fluctuations has shown no signs of improvement in more recent years. Within low income countries, there are no large regional differences in the incidence and size of commodity price shocks.

18. **Quantity effects can also be important in explaining export revenue volatility.** For example, in the case of Mali cotton exports, of the 13 times during the last 25 years that cotton export revenue remained below the 1985-97 average, 10 times were due to a fall in quantity (for example, in 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008). In other words, quantity effects can also



Note: The figure reflects changes in the Deaton Miller index deflated using the dollar manufacturing unit value of imports. The y axis is the coefficient of variation in percent.

Source: Gilbert, C, J. Dehn and P. Varangis, 2004 “Commodity Price Volatility”, in Aizenmann et.al. op. cit.

cause a sudden increase in imports, particularly for food items. It is more difficult to analyze quantity shocks because they depend on specific country and commodity conditions.

## Natural Disasters

19. **Four types of natural disasters in developing countries — earthquake, flood, drought, and cyclones — account for more than 90 percent of all the fatalities and damage from natural disasters.** The five most disaster prone countries in the world have been the Democratic Republic of Korea, Mozambique, Armenia, Sudan, and Ethiopia.<sup>13</sup> The costliest natural disasters tend to occur in densely populated high income countries. But expressed relative to GDP, the two costliest natural disasters have been in developing countries.<sup>14</sup> Natural disasters have been growing in frequency and severity in developing countries, partly owing to rapid urbanization in many of these countries. Low income countries have, on average, a disaster once every two and a half years (compared to four and a half for the average developing country).<sup>15</sup> Although average damages from large disasters as a percent of their GDP is declining for developing countries overall, it is showing some increase amongst low income countries (Table 4).

### C. Shocks Have A Significant Impact On Low Income Countries

20. **Natural disasters and terms of trade shocks have direct and indirect effects on growth and poverty as well as on other key macroeconomic outcomes.** Natural disasters destroy human and physical capital, directly lowering productive capacity and incomes, with usually disproportionate effects on the poor. Negative terms of trade shocks, on the other hand, imply a shift in relative prices against exporters, lowering earnings in specific export sectors.<sup>16</sup> With low-income countries increasingly adopting more flexible exchange rates, there is a tendency to “adjust away” the shock, with little focus on consumption smoothing. Consumption smoothing is also difficult because low-income countries lack adequate cushions, such as foreign exchange reserves, to protect against shocks. Consequently, the macro-consequences of shocks to low income developing countries – on GDP growth and poverty and on internal and external balances – tend to last a long time, often requiring painful adjustment measures. Moreover, the impact of these shocks is usually amplified through inappropriate fiscal policies, limited development of domestic financial markets, partial access to a highly restricted set of global insurance opportunities, and labor market rigidities. Measures to protect against the macroeconomic consequences of shocks are few and difficult to implement, often requiring standards of governance, policies, and institutions that are relatively rare in low income countries. This suggests an important role for international action, particularly by the international financial institutions, to help these countries through a combination of technical assistance, policy advice, and financial support.

21. **Commodity price shocks, in particular, affect low income countries disproportionately because the relative importance of commodities is higher in low income**

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<sup>13</sup> UNDP. 2004. “*Reducing Disaster Risk: A Challenge For Development*” (www.undp.org)

<sup>14</sup> The 1995 flood in the Democratic Republic of Korea and the 1997 volcanic eruption in Monserrat.

<sup>15</sup> To avoid including small events, the term disaster in this paper includes events where the direct cost of damage is estimated at above half percent of GDP or the fatalities exceed half percent of the population.

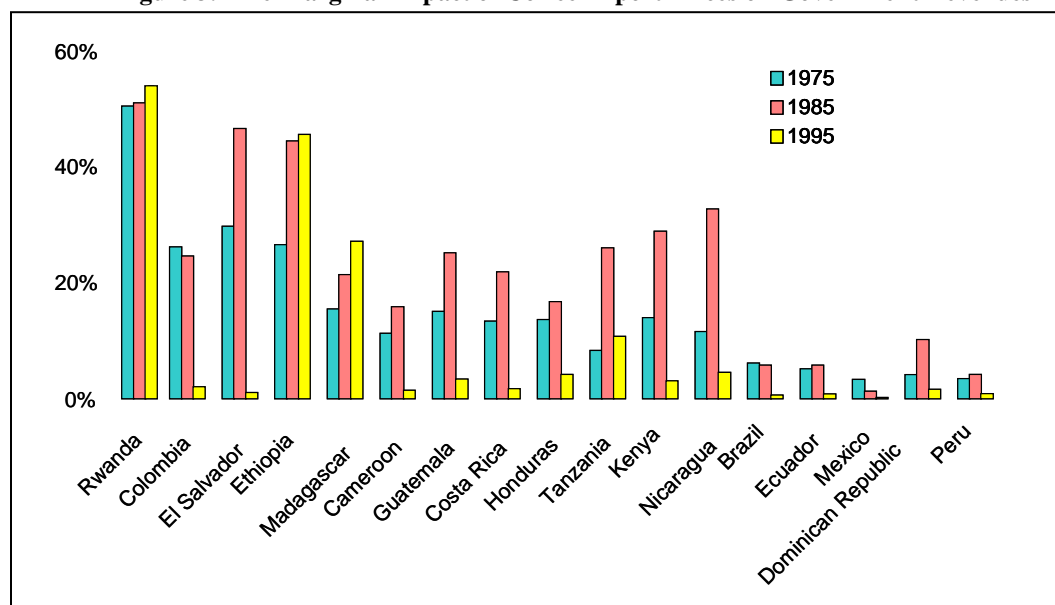
<sup>16</sup> Occasionally, terms of trade shocks are driven by increases in the price of imports, which favor producers of import substitutes. But terms of trade shocks driven by import price increases most often arise from increases in the prices of *commodity* imports, especially oil, for which there is usually no counterpart import substitution sector.

**countries.** In three out of every five low income countries (compared to two out of every five for middle income countries), primary commodities account for more than 50 percent of total exports.<sup>17</sup> Moreover, the vast majority of low income countries are price takers for the commodities they export, so there is no negative correlation between prices and quantities that would help stabilize export revenues automatically.

22. While government revenues in most low income countries are becoming less dependent on commodity-based taxes due to greater diversification of output and exports and a broadening of the tax base, for some low-income countries, this dependency still appears to remain high (see, for example, Rwanda, Ethiopia and Madagascar in Figure 3).

23. **Shocks and growth are closely related.** Shocks, especially terms of trade shocks, statistically explain as much of the variance in growth rates over 10 year periods as do country policies.<sup>18</sup> Indeed, the negative effect of shocks on growth has become considerably larger in the last two decades. This is not due to a change in trends of shocks over time but, rather, to the

**Figure 3. The Marginal Impact of Coffee Export Prices on Government Revenues**



Note: The vertical axis of the graph shows the percent change in government revenues from a 100 percent change in coffee export prices.

Source: Gilbert, C, J. Dehn and P. Varangis, 2004 "Commodity Price Volatility", in Aizenmann et.al. op. cit.

reduction in growth in the 1980s and 1990s and the mounting inability of low income countries

<sup>17</sup> A country qualifies as an exporter of primary products if at least 50 percent of its exports are in primary commodities.

<sup>18</sup> Easterly, Kremer, Pritchett, and Summers. 1993. "Good Policy or Good Luck: Country Growth Performance and Temporary Shocks", Journal of Monetary Economics, Vol. 32, No. 3, pp. 459-483.

**Table 4: Frequency and cost of natural disasters across countries**

	Developing Countries <sup>a</sup>	Small States	Low Income	Others
a. Average Years Between Reoccurrences of Large Disasters <sup>b</sup> (Number of Years)				
1977-1981	7.7	7.8	6.0	10.8
1982-1986	6.1	7.8	5.1	6.8
1987-1991	5.1	5.7	3.8	7.0
1992-1996	4.9	8.2	3.2	7.4
1997-2001	3.4	5.5	2.5	4.4
b. Average Damage from Large Disasters <sup>c</sup> (Damages per disaster, as percent of GDP)				
1977-1981	7.1	22.4	3.2	1.8
1982-1986	7.0	20.6	4.9	2.4
1987-1991	12.3	34.7	4.8	2.3
1992-1996	3.3	11.7	2.7	1.0
1997-2001	4.1	9.0	5.8	1.5

a/ Sample includes 31 small states, 59 low-income countries, and 56 other developing countries.

b/ Average number of years between reoccurrence of large disasters is calculated as an inverse of the average annual number of disasters per country, which is the annual number of disasters divided by the number of countries. A disaster is defined as “large” if it affected at least half of a country’s population or caused damages of at least half a percent of GDP or resulted in more than one fatality in every 10,000 population.

c/ Average damage per disaster is based on unweighted averages of country ratios of damage-to-GDP.

Source: IMF (2003), “Fund Assistance for Countries Facing Exogenous Shocks”.

to deal with shocks.<sup>19</sup> Past shocks have brought down trend rates of growth in low income countries, which makes new shocks an even larger factor relative to a smaller base.

24. **The effect of shocks on growth is asymmetric.** The adverse effects of negative shocks tend to be irreversible (for good reason, as explained below), and even positive shocks can, at times, have negative effects if they result in a spending boom (Box 1). Analysis of a sample of 56 countries with data from 1970-93 has shown that negative shocks significantly reduce growth rates while positive shocks have no significant effect. Almost as important, the results also show that aid to countries experiencing positive shocks has little noticeable effect, but increases in aid to countries experiencing negative shocks has an effect on growth that is significant at the 99 percent confidence level.<sup>20</sup>

25. **There are many reasons why large negative shocks have effects on growth that cannot be offset by later positive developments.** Large, persistent negative shocks tend to have irreversible effects on human capital; negative shocks may lead to capital outflows that are difficult to reverse; shocks in the form of financial crises can produce a credit crunch than can lead to irreversible damage to the industrial and social fabric; household assets may be drawn down prematurely in the wake of a shock, reducing the ability of the poor to smooth income; and unemployment of the unskilled can become permanent as employers hoard skilled labor in

<sup>19</sup> Hnatkovska, Viktoria and Loayza, Norman. 2004. “Volatility and Growth”, in Aizenman, Joshua and Brian Pinto (eds.) op. cit.

<sup>20</sup> Collier, Paul and Dehn, Jan. 2001. *Aid, shocks, and growth*, mimeo., World Bank, October 2001.

downturns, reducing the likelihood that unskilled workers will be rehired if and when the upturn eventually arrives.<sup>21</sup>

26. **Evidence from negative shock episodes also shows that poverty increases, although this appears to be related mainly to the general decline in growth and incomes rather than deterioration in income distribution.** At the same time, however, there is weaker evidence that output shocks have a negative impact on income distribution.<sup>22</sup> Low income groups are more vulnerable to shocks than others because: their incomes are less diversified; their lower human capital makes mobility across occupations and regions more difficult; their reduced access to capital and financial markets makes it difficult to save in good times and borrow in bad times; and dependence on public services (especially health and education) exposes them to fiscal cuts in real terms, including through inflation.<sup>23</sup> Research findings indicate that households respond to shocks in various ways. These range from adjusting labor supply, diversifying incomes, and reducing consumption, to taking children out of school, relying on formal and informal safety nets, and in some cases using formal risk markets. Households that manage risks by taking preventive measures ex-ante often do better than households that try to react after the shocks have occurred (Box 2).

27. **Shocks also affect growth indirectly through effects on a country's macro-balances and debt.** Fiscal balances are usually affected through reductions in revenues associated with lower incomes, while expenditures on pro-poor programs frequently increase following shocks. If increased grant financing is unavailable to fill the resulting rise in fiscal deficits, governments in low income countries are faced with two choices: make the needed adjustments in public expenditures (usually, this leads to substantial declines in public consumption since public investment tends to be financed largely from external aid) or borrow from the least costly sources of finance. Low income countries do both, although the mix varies from country to country, and depends on the nature of the shock.

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<sup>21</sup> Agenor, P. 2001. *Business cycles, economic crises, and the poor: Testing for asymmetric effects*, World Bank Policy Research Working Paper No. 2700.

<sup>22</sup> The evidence is weaker because the conclusion is not entirely robust across all country groups.

<sup>23</sup> Laursen Thomas, and Mahajan, Sandeep. 2004. "Volatility, Income Distribution, and Poverty", in Aizenman, Joshua and Brian Pinto (eds.).

### **Box 1 Why Commodity Booms Are Not As Good As Commodity Busts Are Bad**

Booming commodity markets can bring good or ill to commodity exporting developing countries depending on how they handle windfalls. Experience suggests that most often the gains from positive shocks are not symmetric with the costs of negative shocks. Often, in fact, the positive shocks, or the policy response they provoke, tends to leave economies in worse shape than before.

Commodity shocks are transmitted to the rest of the economy essentially through their effects on the fiscal stance and the real exchange rate. When revenues from commodity exports rise, governments are tempted to make long-term spending commitments based on what turns out to be a temporary phenomenon. Consider Colombia, Kenya, and Tanzania after coffee prices boomed in the late 1970s. Similarly, in the post-oil boom of the 1970s and early 1980s, the shortfall of revenues in Nigeria was so severe that external borrowing rose dramatically even before oil prices began to fall. It was much the same in Venezuela and Mexico. In addition to increasing long-term debt, spending booms that follow temporary commodity price increases also magnify the size of the eventual macroeconomic adjustment that must eventually result.

Moreover, the increased foreign exchange earnings associated with higher commodity prices can lead to an excessive appreciation of the real exchange rate. This makes other tradable sectors less competitive in global markets and, ultimately, can lead to a decline in their output. This is sometimes known as the Dutch disease, after the experience of the Netherlands in the 1960s following the discovery of North Sea gas. Since investment alternatives in other tradables look unattractive at the appreciated exchange rate, windfall revenues tend to be invested in the booming commodity subsectors -- even when producers are aware that the boom is temporary. This can lead to overcapacity and much lower prices later, and can have long-term negative effects on a country's diversification efforts, exacerbating its commodity dependence.

Policy options are available that help maximize the benefits and minimize the problems associated with positive commodity shocks: countercyclical fiscal and monetary policy, liberal trade policy, special instruments to offset the impact on government revenues or foreign exchange flows (revenue stabilization funds, commodity bonds), and, in the long run, deepening of the financial system and diversification of the production base. But all too often, these have not been designed properly or used to full advantage.

Source: P. Varangis, T. Akiyama, and D. Mitchell, *“Managing Commodity Booms—and Busts”*, World Bank Directions in Development, 1995

28. **The high correlation between terms of trade volatility and fiscal volatility (Figure 4), and the collateral evidence that public expenditures in developing countries tend to be procyclical, supports the view that country authorities find it difficult to shield public expenditures (especially public consumption) from shocks.**<sup>24</sup> The main reason is the inability to obtain domestic or external finance on appropriate terms, which forces reductions in real public expenditures. And the volatility in fiscal stance is reflected in the volatility of monetary

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<sup>24</sup> Perry, G. (2002). *“Can fiscal rules help reduce macroeconomic volatility in the Latin American and Caribbean Region”*, World Bank Policy Research Working Paper 3080 (June).

### **Box 2 Impact Of the Recent Coffee Price Shock On Poverty In Central America**

A steep decline in the world coffee price has had a dramatic impact on the coffee-producing countries of Central America—Guatemala, Nicaragua, Honduras, El Salvador, and Costa Rica—and on households that depend on coffee-related income. Much of the initial emphasis and assessments were on large employment losses at large coffee estates, but there were few insights about the impact of the crisis on poverty. To fill the knowledge gap, the World Bank analyzed the socio-economic impacts of the crisis on coffee farm and labor households in these countries, explored household risk management strategies and responses and identified effective government interventions to address the coffee crisis.

Across the countries covered, the study found consistent evidence of the negative welfare effect of the coffee crisis:

- among rural households involved in coffee activities in Nicaragua, poverty increased by 2.4 percent, compared with a decrease in poverty of more than 15 percent among households not connected with the coffee sector;
- in El Salvador, nutrition indicators of children among households involved in coffee activities deteriorated; while real incomes among coffee households in Honduras declined between 2000 and 2002, those among non-coffee households increased;
- in Guatemala, coffee farmers were more likely to be poor in 2000 compared to non-coffee farmers.

The findings also suggest that the formal and informal risk management strategies of households were both diverse and complex. They ranged from adjusting labor supply and diversifying income sources, to changing consumption patterns. As expected, households that used risk mitigating and preventive strategies (such as having a more diversified income portfolio) seem to have done better compared to those that used coping instruments (taking children out of school, selling assets).

In Nicaragua, somewhat surprisingly, small coffee farmers appear to have been hit harder than coffee laborers (although laborers are the chronic poor). This could be because incomes of small coffee farmers tends to be less diversified, highlighting the importance of income mobility and adaptability to risk management.

A number of conclusions have emerged from the study. First, there is a clear need for investments in mobility including through improvements in infrastructure, strengthened agricultural and non-agricultural linkages, deeper rural financial markets, and enhanced human capital. Second, small farmers and poor households need access to insurance mechanisms. Finally, the development of appropriate, well targeted safety net instruments is crucial. As the findings suggest, measures to protect investments in children's education, health, and nutrition can be important in ensuring that shocks do not result in long-term losses in human capacity.

Source: World Bank. "*Shocks and Social Protection: Lessons from the Coffee Crisis in Central America*", Latin American and Caribbean Region, forthcoming.



policy (as measured by the standard deviation of base money growth – Figure 5). Together, then, these policies tend to exacerbate the initial impact of shocks, not because policy making capacity is necessarily weak (although this is also often the case), but because countries do not have the fiscal space to conduct counter-cyclical programs.

29. **Just as low income countries have little fiscal space to protect public expenditures, they also have limited foreign exchange reserves and external financing means to protect against import compression in the face of shocks.** At the same time, the impact of shocks on the external balance of payments has a secondary effect through changes in the real exchange rate. Indeed, where many studies have found it difficult to explain exchange rate movements over long periods, a robust finding that has emerged recently for many commodity dependent low income countries is that the real price of commodity exports and real exchange rates do tend to move together in the long run.<sup>25</sup>

30. **Overall, policy and institutional weaknesses tend to amplify and lengthen the effects of exogenous shocks.** Markets, institutions, and policies play a key role in absorbing or amplifying shocks. Among these shock absorbers are domestic financial markets and their links to world financial markets, fiscal policies, and labor markets. The evidence suggests that rather than absorb shocks, domestic policies in typical low income countries tend to amplify their initial impact. A combination of shallow financial markets and weak links to global markets makes it difficult for these countries to diversify risk or obtain and reallocate financial resources at times of distress. The association between underdeveloped financial markets and volatility is clearly brought out by international evidence (Figure 5).<sup>26</sup> And, in turn, high volatility tends to hamper the emergence of a strong financial system.

31. **One analysis shows that when all these factors are put together, they explain the bulk of the variation in growth volatility across countries.** The most important factor explaining differences in growth volatility across countries is the volatility of policies, followed by the terms of trade and then the degree of financial integration with global economy.<sup>27</sup>

### III. POLICY IMPLICATIONS AND GLOBAL ASSISTANCE

32. **Broadly speaking, there are three strategic elements that governments can use for dealing with exogenous shocks.**

- First, governments can take **preventive actions** to protect their finances, economies and populations against shocks. This could take the form, for example, of enacting building codes that prevent or minimize damage in case of earthquakes, or investments in irrigation and drought resistant technologies. But it also entails many other policy actions

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<sup>25</sup> Cashin, Céspedes, and Sahay. 2002. “*Keynes, Cocoa, and Copper: In Search of Commodity Currencies*”, IMF Working Paper, 02/223.

<sup>26</sup> At the same time, the implication is not necessarily that there should be unbridled expansion in financial markets without adequate regulations and supervisory oversight. The East Asian crisis exemplifies the folly of such an approach.

<sup>27</sup> de Ferranti, D. et. al. (op. cit.).

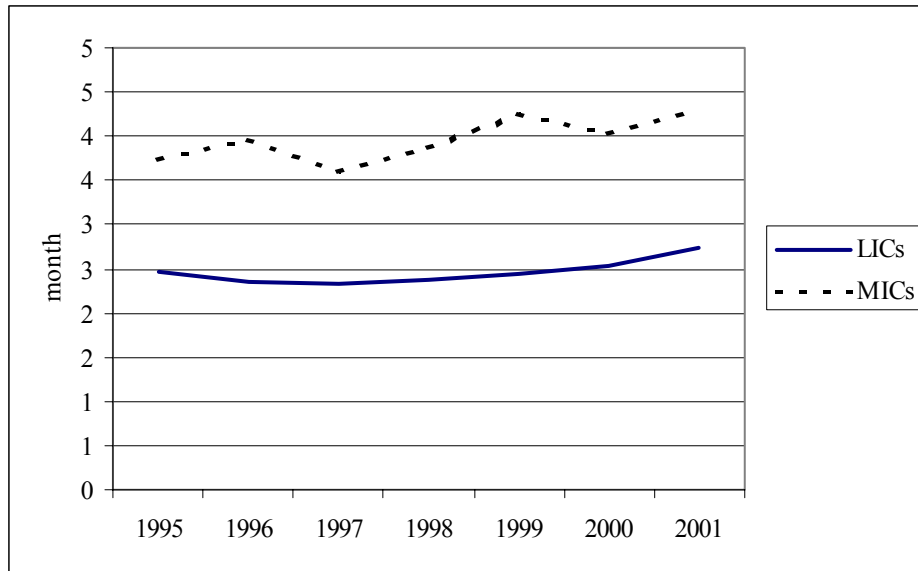
that are not at first glance related to particular shocks, including diversifying the economy's sources of growth and strengthening its financial sectors so as to reduce vulnerability; minimizing public debt, improving revenue and public expenditure management so as to create fiscal space for responding to shocks; easing labor market rigidities that force adjustment through employment rather than wages; developing targeted social safety nets that can be implemented and scaled up quickly; strengthening vulnerability assessments, preparing comprehensive disaster management plans, and improving dissemination of hazard information; and developing insurance markets so as to lower costs and increase penetration. In this light, it is clear that many of the Bank's core activities contribute to making economies less vulnerable to shocks.

- Second, governments can **self-insure**, for example, by setting aside windfalls earned in good times to be used in bad times, and building up reserves. Reserve levels in low-income countries, on balance, are lower than in many middle-income countries (Figure 6). For a typical African country, imports are about 30 percent of GDP, so that an additional 3 months cover -- say from 3 to 6 months -- could buffer a shock equivalent to 8 percentage points of GDP, providing a first line of defense. In the case of natural disasters, countries could have annual budgetary allocations and create calamity funds (for example, India, Mexico and the Philippines). Countries can also pursue more formalized mechanisms for buffering fiscal revenues from shocks, such as revenue stabilization funds. These funds, of course, require transparency, good governance, and appropriate institutions to manage them. Experience with such funds has been mixed, with some funds falling victims to corruption and political interference, but if well designed and managed, they can be an effective means to insulate government spending from year-to-year instability. Governments have often tried to buffer their own producers from price movements using price stabilization funds, another variety of self-insurance, usually with poor results (see below).
- Third, governments (or individual actors) can **seek insurance in international markets**. They can, for example, purchase insurance against specific types of natural disasters, or pursue hedging opportunities to insure against the effects of commodity price movements.<sup>28</sup> In addition to hedging revenues from commodities, governments could in principle hedge spending programs. For example, a government could use hedging instruments in such a way that if food prices were to spike, and require an increase in government spending on safety nets, they could finance part of this increase from the pay-out on the hedging instruments. Similarly, government can use hedging markets to protect against spikes in imported oil prices.

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<sup>28</sup> Insurance markets absorb risks within a portfolio of diversified risks while hedging relies on finding a counterparty to offset the risk (that is, trade the risk). Thus, hedging and insurance markets have distinct characteristics that are also reflected in pricing of the risks.

**Figure 6. Low-Income Countries Have Lower Reserves**



Note: Figure depicts average foreign exchange reserves (weighted by GDP), in months of imports of goods and services, for low and middle income countries respectively. Middle-income country data excludes China.

Source: IMF, International Financial Statistics.

33. **Table 5 lays out other examples of each of these strategies.** Notwithstanding these ex-ante strategies, most economies will also need to cope with large shocks ex-post using a combination of financing and adjustment measures to mitigate the impact of the shock.

34. **Each of these strategies has some inherent constraints.**

- Policies to reduce vulnerability to shocks and volatility by diversifying the economy and making it more resilient have many benefits in addition to reducing exposure to risk. But such actions take time to show results and are effective only in the medium to longer term.
- Many self-insurance instruments require relatively sophisticated government institutions that are not subject to political pressures, making them difficult to implement effectively in low-income countries. The particular experience of self-insurance through price stabilization funds for commodities, for example, has been very unsatisfactory.<sup>29</sup> This is mainly due to the long duration of price shocks, the uncertainty over when the recovery will take place, and the inherent potential for rent-seeking, corruption and political interference in the operation of such funds. Self-insurance at the household level very often leads to lower mean income.<sup>30</sup> Even reserve accumulation is difficult politically, as there are always pressures to spend windfalls, as well as a tendency to overestimate their duration.

<sup>29</sup> See Deaton (1992), Knudsen and Nash (1990), Bates (1981) amongst others.

<sup>30</sup> See Dercon (2002).

- Hedging aggregate export proceeds, government revenues or spending programs in global markets has limited potential for many low income countries. The financial instruments and the markets for hedging price risks deal mainly with short term fluctuations in commodity prices and do not exist for all commodities. The available options for hedging are also limited in comparison to the macroeconomic needs of developing countries.<sup>31</sup> Insurance can be costly for disasters that frequently occur in these countries and the availability of external assistance reduces incentives for purchasing insurance. Furthermore, providers of insurance and hedging instruments may be less familiar with risks and clients in low income countries, and therefore may not be as eager to deal with them. Insurance providers may also be faced with challenges in obtaining reliable data and verifying and assessing damages, although they may be better able to do so for large disasters, such as earthquakes or floods. Also access to capital markets tends to be limited for low income countries, particularly those vulnerable to external shocks. Domestic markets for insurance and hedging instruments are usually weak and their penetration is low, with only a few large companies and rich households being able to afford it.<sup>32</sup>

**35. A large part of programmed assistance by the global donor and creditor community has focused on helping low income countries reduce their vulnerability to shocks.**

**Assistance to cope with the aftermath of shocks, while often significant in magnitude, has on the whole been ad hoc and not always timely.** There are several reasons for this. First, some shocks are difficult to recognize as shocks when they occur (for example, price movements) or reveal their severity only slowly (for example, droughts); identifying them as shocks and then designing an appropriate response is inherently data intensive and time-consuming. Second, few financial assistance instruments are designed explicitly to offset negative commodity shocks. In addition, there has been a concern that the promise of outside assistance may reduce the incentive of public or private sectors to take adequate measures to prevent or mitigate shocks – the “moral hazard” problem that is inherent to all insurance markets. Two compensatory financing programs do exist, however, that attempt to achieve greater automaticity in responding to commodity price shocks. These are the European Union’s FLEX program (which replaced the earlier Stabex and Sysmin programs) and the IMF’s Compensatory Financing Facility (CFF). The latter has not been used since 2000. The IMF’s main mechanisms that have been used to respond to shocks are its PRGF and standby facilities, and the staff has recently proposed changes to make more consistent its financing response to shocks in low income countries (Annex I).

**36. Ex-post assistance for natural disasters has focused on both prevention of future shocks and mitigation, and includes humanitarian assistance and reconstruction and rehabilitation.** Humanitarian assistance excluding refugee aid has grown from an average of 4.3 percent of total official development assistance (ODA) in the early 1990s to over 7 percent by the earlier part of this decade. Though this assistance is now provided in a more systematic

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<sup>31</sup> It should also be noted that terms-of-trade movements, as derived from the deflators in national accounts, at times can deviate quite a bit from estimates based on changes in world prices of export or import commodity baskets.

<sup>32</sup> In developing countries less than 1 percent of direct losses from natural disasters are insured compared to over 40 percent in developed countries.

manner, much of it has been concentrated on few large and highly visible disasters. About 3 major disasters account for about two-thirds of total disaster assistance (OCHA). Low income countries often face a problem attracting the attention of donors for smaller disasters, several of which may have serious impacts that are not highly publicized (such as the series of droughts in Central America during the late 1990s).<sup>33</sup>

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<sup>33</sup> It should also be noted that low income countries do not usually, if at all, attract donor assistance when faced with commodity price shocks.

**Table 5: Possible country-level policies to deal with shocks at the macroeconomic level**

	<b>Market Insurance</b>	<b>Self-Insurance</b>	<b>Prevention</b>
<b>Source Of Shock</b>			
Terms of trade	<ul style="list-style-type: none"> <li>▪ Hedge export proceeds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Foreign exchange reserves</li> <li>▪ Producer price stabilization funds</li> <li>▪ Revenue stabilization funds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trade diversification</li> </ul>
Natural disaster	<ul style="list-style-type: none"> <li>▪ Disaster insurance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Safety nets</li> </ul>	<ul style="list-style-type: none"> <li>▪ Early warning systems</li> <li>▪ Building codes</li> <li>▪ Fire codes</li> </ul>
<b>Policy Amplifier</b>			
Financial system	<ul style="list-style-type: none"> <li>▪ Strong links with international banking and insurance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Large capital and liquidity requirements for banks</li> <li>▪ Deposit insurance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Portfolio risk management</li> </ul>
Fiscal policy	<ul style="list-style-type: none"> <li>▪ Hedge fiscal revenues</li> </ul>	<ul style="list-style-type: none"> <li>▪ Precautionary targets</li> <li>▪ Contingent budget rules</li> <li>▪ Targeted income transfers to poor</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tax base diversification</li> <li>▪ Public debt management</li> </ul>
Labor markets		<ul style="list-style-type: none"> <li>▪ Unemployment insurance</li> <li>▪ Public works programs</li> <li>▪ Individual savings accounts</li> </ul>	<ul style="list-style-type: none"> <li>▪ Legislation balancing worker and employer rights</li> <li>▪ Training</li> </ul>

Source: De Ferranti et. al, World Bank staff

37. **Reducing vulnerability to shocks and volatility has been an important aspect of the World Bank's assistance strategy for low-income countries.** Most of the factors that make low income countries more vulnerable to exogenous shocks are the very development issues that are the central mandate of development institutions. The Bank's objective has primarily been to facilitate investments and policy changes that help low income countries overcome the conditions that cause vulnerability to shocks—for example, diversification of economic and financial systems, rural development, etc. Policy advice and technical assistance has been offered by the Bank as part of its normal analytical work, and has been offered in collaboration with other development partners, including the IMF, which has focused its own policy advice largely on appropriate macroeconomic policies to prevent or mitigate shocks. The range of mechanisms employed on this is vast.

38. **In addition, some World Bank assistance has focused on ex-ante risk management at the micro level.** The Bank has also helped households, farmers, and firms gain better access to risk management instruments. The World Bank and donors support a dedicated initiative on Commodity Risk Management (CRM) that provides policy advice, feasibility assessments and dedicated technical assistance to organizations of commodity producers and financial institutions in client countries. This initiative assists these groups to analyze risks, devise risk management strategies and, if feasible, access market instruments to deal with price and weather related risks affecting commodity revenues. Beyond the specific work on commodity risk management, the World Bank has been putting risk management at the core of its conceptual and strategic work on social protection. Through economic and sector work and policy research it has supported countries at the macro level, and the most vulnerable and poor at the micro level, to develop and implement appropriate risk management instruments and safety nets .

39. **The World Bank has also provided financing to help mitigate the consequences of shocks, especially to prevent a large decline in consumption in the aftermath of a shock** (Box 3). Arguably, while the Fund would be responsible for financing pure balance of payments effects of a shock, World Bank assistance is critical in maintaining pro-poor expenditures, providing social safety nets, and preventing large cuts in productive government investments which would otherwise result when governments must re-channel resources to alleviate the effects of shocks. The World Bank has lent more than \$43 billion for over 550 natural disaster related projects, excluding reallocations from ongoing projects. While the World Bank has been active on a large scale in helping mitigate the impact of natural disasters through various loan products (mainly emergency recovery loans and sectoral investment loans), its assistance in mitigating the impact of commodity price shocks has been more ad-hoc and discretionary. Nonetheless, there have been some programmatic approaches to price shocks, such as the multi-country effort to mitigate the negative effects of an oil price shock in 2000.

**40. There are some important general lessons for country assistance programs emerging from the experience of international financial institutions in risk management and mitigation.<sup>34</sup>**

- First, prevention is better than cure, though it is inherently more difficult (para. 32). Better preparation and planning in anticipation of a shock can both reduce the damage and improve effectiveness of ex-post assistance. Assistance programs for shock-prone economies should put priority on helping countries to take actions (as enumerated above) to reduce their exposure to risk. They should also help the government to develop a strategy for responding to shocks that (a) identifies appropriate roles for institutions and structures, (b) includes planning and targeting of funds, (c) establishes safety nets, and (d) has systems in place to identify the financial needs from the shock and the sources of financing them.
- Second, it is important to link the response mechanisms at the macro and micro levels to ensure that the vulnerable groups that are hardest hit by the shock are provided a safety net. One weakness of some instruments in the past has been that the proceeds of compensatory instruments go to the central budget, with no assurance that the ultimate beneficiaries will be individuals most heavily impacted by the shock. The ex-ante planning process should identify these groups and ensure that programs are available to assist them. Furthermore, insurance coverage at the national level should enable the emergence of private insurance arrangements at the micro level.
- Third, because of the inherent limitations of any single strategy for risk management, countries should generally pursue multiple approaches, with the emphasis placed on each calibrated according to the importance of different types of shocks and the conditions in each country.
- Fourth, to be effective and counter-cyclical, an ex-post response must be fast and timely. The effectiveness of instruments to respond to shocks in the past (CFF and STABEX) has often been undermined by the long delays in decision making and project approval, cumbersome procurement rules, and delays contracting civil works. One issue that requires examination is whether it is suitable to have the same procurement procedures for investment projects as for emergency assistance projects, or whether SILs in response to shocks should be hybrid operations, with a fast-disbursing component. The lack of timely data about the size and impact of some shocks, particularly for shocks such as commodity prices and droughts, can also contribute to delays in response.<sup>35</sup> Furthermore, instruments that were intended to be fairly automatic have been slowed by preparation and decision-making, at least partially in an attempt to control the moral hazard problem. There appears to have been a trade-off between automaticity and controlling moral

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<sup>34</sup> OED has underway an evaluation of the World Bank assistance for natural disasters and emergency reconstruction for delivery in FY05. Also, OED has a number of audits on ERLs and related instruments and wrote a précis on disaster assistance in 1998 (see OED, 1998, *Disaster Assistance*, Precis No.174).

<sup>35</sup> For example, due to lack of data it was difficult to obtain timely assessment on the size and balance of payments impact of the shock in the seven African country World Bank operation discussed in Annex II. More difficult was to obtain estimates of the impact in terms of higher fuel prices being felt in the countries.

hazard. One possible approach to minimizing this problem may be to include automatic shock-related triggers for disbursements in country programs, based on pre-qualification of countries for assistance. It would also improve the timeliness of response if data collection systems were better; technical assistance aimed at this objective could have significant benefits.

**41. There are also important lessons to be learnt from experience at the micro level.**

First, the commodity risk management initiative has shown that it is feasible for producer organizations to access risk markets, although progress has been slow. This is because local institutions are weak, particularly in administration and financial management; transaction costs are high for delivering financial services to farmers<sup>36</sup>; and skills to deal with risk markets are few. The initiative is facing the same institutional and capacity constraints as with respect to rural development issues in low-income countries. To overcome these constraints will require sustained effort over a long period (Annex III). Second, the experience with social safety nets shows that these programs (a) cannot generally be established during a crisis; (b) should target groups to which assistance is likely to be provided; (c) should be simple; and (d) should leverage funds to help households reduce risks and diversify income sources (Annex III). At the national level, the most important risk management actions for households are policies and investments that encourage economic diversification and growth to and facilitate income and employment alternatives in the event of commodity price declines, droughts, or other shocks.

**Box 3 The World Bank's response to the events of September 11, 2001**

Following the events of September 11, 2001, the World Bank Group in concert with other donors moved first to identify those countries that would be hit the hardest, and then put together enhanced packages of assistance. Two classes of countries were targeted: those experiencing a direct impact (including loss of tourist receipts and increased refugee flows) and those that were hurt by the global economic slowdown (including reduced commodity prices, export demand, and capital flows). In the former group of countries, enhanced assistance was delivered primarily through investment lending, including six new operations (five of which were emergency recovery operations) and five accelerated lending programs, with one new adjustment operation, for a total of \$174 million in additional or accelerated lending. The bulk of the Bank's response was to the latter group of countries, mainly through adjustment loans, for a total of \$1,516 million in additional or accelerated loans.

Source: World Bank staff.

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<sup>36</sup> Similar problems exist for delivering micro-finance to small producers.

#### IV. WORK AGENDA FOR PREVENTING AND MITIGATING THE IMPACT OF SHOCKS

##### A. A Large Agenda Remains At The Macro Level

42. **This paper has broadly covered the magnitude and frequency of shocks and what the world community (including the World Bank) is doing to assist low-income countries in dealing with them. But there remains a huge agenda of further work to develop a coherent strategy to deal with shocks that fits within the global community's broader assistance strategy for low-income countries.** In particular, one broad area relates to more systematic coordination of a response by the global community in dealing with shocks. The modalities for this coordination would need to be worked out. To better inform such a global response, five specific questions have been raised that warrant further consideration given the immediate and long-term costs of shocks in low-income countries:

- The first question that needs to be addressed is how we would define a shock for operational purposes. Such a definition will need to be rooted within a clear analytical framework and would potentially have implications for estimates of the cost of shocks, the volume and timing of additional resource flows needed to assist low income countries in dealing with them, and for the design of any ex-post instruments.
- Second, more analysis is needed on the impact of other types of shocks, such as trade, aid, and civil conflicts in neighboring countries, in order to determine their relative importance and explore appropriate approaches that would effectively provide assistance to deal with them. Furthermore, it is important to evaluate not only assistance to natural disasters and emergency reconstruction but broader assistance to the various shocks that impact particularly low income countries.
- Third, we need to get a better empirical understanding of how existing financial instruments employed by the official creditor and donor community are helping to mitigate the economic losses and long-term impacts of shocks in low income countries. Further work needs to be undertaken to understand how preventive and ex-post mitigation assistance has performed toward this end, and whether current instruments are sufficient, efficient, and equitable.
- Fourth, the advantages and disadvantages of using financial instruments that incorporate a certain degree of automaticity in providing timely additional finance to cope with the aftermath of an exogenous shock need to be explored further. While such instruments may have the welcome advantage of speed, they are susceptible to risks of moral hazard (for example, incentives to protect against shocks may be eroded). Such issues bedevil all instruments that provide insurance, and the research question is whether financial instruments can be developed that can overcome these constraints. If so, then instruments that can provide such automaticity would need to be analysed in light of (a) their potential benefits to countries experiencing shocks and their incentives to deal with them, and (b) institutional limitations, both from the point of view of practical implementation and financial risk.
- Fifth, we need to re-examine whether there is scope for the international community to facilitate low-income countries' access to market-based mechanisms such as hedging and insurance. This should take into consideration the different types of risks and market mechanisms (for example, insurance markets for natural disasters, hedging markets for

commodity prices, insurance markets for weather risks, etc.). The use of market mechanisms could be part of exploring ex-ante responses to shocks.

43. **The remainder of this section describes a number of approaches that may have the potential to increase the predictability of financing or augment the level of financing in the face of a shock.** Some very preliminary work is underway to explore the feasibility and benefits of some of these approaches.

#### **Reduce Debt Service in Response to a Shock**

44. **One broad set of instruments could seek to reduce the debt service burden in low-income countries in the aftermath of an exogenous shock. Three mechanisms are being explored in this context:** commodity-linked repayments, inflation-indexed local currency lending, and deferred repayment schemes. For all of these instruments the design crucially hinges on how to set the eligibility criteria in a way that would benefit countries facing exogenous shocks, while continuing to encourage the appropriate adjustments to permanent and recurrent shocks, and at the same time maintaining the financial integrity of the Bank. Given previous experience in the use of financial instruments that include an automatic response to shocks, expectations are modest about the practical application of most of these instruments.

45. **Linking debt service to commodity price shocks:** Since commodity price shocks account for a large subset of exogenous shocks, one approach could link debt service obligations to prices of the key primary commodities exported by a country. Preliminary research shows, however, that this may not be a very useful instrument. Movements in an international commodity price do not always accurately reflect movement in a country's reported export revenues, even if the country is highly dependent on that commodity. Moreover, such schemes present difficult tradeoffs between the cost to lenders and the benefits to low-income borrowers. Benefits from swap arrangements that would accord countries flexibility to vary debt service payments on the basis of commodity price volatility is minimal – worth the same as a cut in debt service payments of at most 5 percent.<sup>37</sup> While linking assistance to commodity price shocks may not be effective, it may be worth exploring arrangements that link assistance to total export revenues, or government revenues as the EU's FLEX program currently does for ACP countries. The challenge here, however, would be to make sure that export earnings are not manipulated to gain access to resources available through such a scheme.

46. **Inflation-indexed local currency lending:** Rather than focusing on commodity prices or revenues, another way to accord flexibility in debt service obligations could be to link them to inflation-indexed local currency units. Since low-income country external debt is mostly contracted in foreign currency, the exchange rate plays an important role in determining the real debt burden. Debt service in domestic currency depends on changes in a country's exchange rate,

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<sup>37</sup> Gilbert and Tabova (2003) analysed schemes that would accord HIPC's flexibility in meeting debt service obligations by making repayments contingent on world prices of the commodities they export. They evaluated the schemes by simulating debt service for 10 commodity-dependent African countries. They found that the results were marginally beneficial because changes in export earnings were not always related to changes in world commodity prices, due to both quantity variations and a large difference between the world price and the price received by the country. See Gilbert, C and A. Tabova (2003) "Re-Alignment of Debt Service Obligations and Ability to Pay in Concessional Lending: Feasibility and Modalities", mimeo.

which is volatile even in the long run.<sup>38</sup> The real exchange rate (RER) usually depreciates in response to an exogenous shock, making debt service (in real terms) more burdensome just at a time when it is more difficult to pay, and vice versa. An effective insurance scheme would reduce the burden of debt service during depreciation and increase it during appreciation. Such a scheme would reflect any changes in the RER, and hence deals with volatility as well as shocks.

47. **This instrument would be akin to inflation-linked bonds, that have provided useful benefits to emerging markets, especially in Latin America.** A variation on this would be to index debt service to growth with the potential of mitigating the impact of output shocks.<sup>39</sup> More work is also needed to assess the practicality of such instruments both for the country and the financial institution, and to assess how such an instrument could be designed to minimize the potential for moral hazard.

48. **Deferred Repayment Schemes:** Another mechanism that could alleviate the impact of a shock through a reduction in debt service, is to defer debt service repayments when a shock of a pre-determined magnitude is experienced. This, even more than some other instruments requires setting strict criteria in defining a shock. The deferred repayment scheme would push debt service payments out into the year(s) following a shock, hence providing quick counter-cyclical financing. Overall the impact on creditor finances would depend on how quickly and how often the mechanism would be triggered which, in turn, would be dependent upon clear definitions and triggers.

#### **Augment Financing in Response to a Shock**

49. **Another approach could be to augment and increase the speed of supplemental finance in the face of shocks.** Instruments that might augment financial assistance could involve, for example, establishing a contingency fund for dealing with shocks, or a deferred draw-down option for countries. For many institutions, a contingency fund would require setting aside resources which then would not be available for regular lending, but would only be available if a country experienced a shock (defined clearly ex-ante). An alternative could be to provide an instrument, where a individual country pre-qualifies for financing, but only draws down the resources in cases of urgent need. This ensures that the financing would be secured for a country should the need arise in the case of a shock. However such an option would require the payment of a commitment fee, and similar to a contingency fund, would tie up IFI resources that could otherwise be disbursed for other development needs.

50. **The international community continues to explore available and potential new instruments to determine the best way to respond to shocks quickly and flexibly.** Some institutions already have the flexibility to provide supplemental finance to adjustment lending. It

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<sup>38</sup> Hausman and Rigobon (2003) suggest that IDA is well positioned to offer insurance against the negative effects exogenous shocks by linking repayments on IDA credits to inflation-indexed local currency units. This would reduce an IDA borrower's (hard currency) debt service payments when its exchange rate is depreciating, and increase it when its currency is appreciating. By linking debt service obligations to local currency units, such an arrangement makes the exchange rate matter less for debt service payments. See Hausmann, R and R. Rigobon (2003) "IDA in UF: On the Benefits of Changing the Currency Denomination of Concessional Lending to Low-Income Countries", mimeo.

<sup>39</sup> Borensztein and Mauro, 2002. This instrument would be similar to growth-indexed bonds for emerging markets.

may be more effective to find a way to modify currently available instruments such as supplemental finance and emergency recovery loans to improve their efficiency and equitability. The international community also needs to exercise caution in moving forward with innovative mechanisms to ensure that these complement other responses to separate but related development issues such as debt distress.

**51. In addition to instruments, each institution needs to consider its role among all multilateral and bilateral actors in addressing the issue of shocks in low-income countries.** This will require first of all an assessment of where the global response has been insufficient to meet country needs. Once those gaps are identified, the international community can then set a work agenda to determine how to strengthen mechanisms across multilateral and bilateral actors to provide a more effective and concerted way to fill these gaps.

### **Facilitate The Use Of Market-Based Mechanisms For Risk Management**

**52. Governments of low-income countries can also use market-based instruments, such as hedging and insurance, to protect against exogenous shocks at the macro level.** While these instruments are used widely in the developed world and in some middle-income countries, they tend to be used less, if at all, by low-income countries due to a variety of reasons. This includes the lack of know-how in these countries, or their lack of creditworthiness which implies typically prohibitive costs to use these instruments. Insurance premia may also be high due to the higher frequency of natural disasters and commodity shocks in low-income countries. Creditors and donors could, of course, facilitate low-income countries' access to such instruments by: financing premia through grants; underwriting repayment guarantees to mitigate credit risk; offering technical assistance; and examining other, innovative ways that lower costs and improve access of market-based risk-management tools for low-income countries.

**53. Hedging instruments for commodity price risks could provide only partial cover to low income countries.** First, commodity shocks tend to last for years while instruments hedging against price risks typically cover only a year or two. Second, once governments liberalize trade policies, it is hard to assess the government's exposure to commodity price changes since this is now indirect. Third, hedging instruments do not cover fluctuations in export volume. Fourth, these instruments are not available for all commodities (for example, tea) and are of limited use for others where export prices do not correlate closely with international exchange prices. Nevertheless, some analytical work indicates that it may be possible to have some partial protection against commodity price fluctuations at the macro level through hedging. Potential avenues exist for creditors and donors to facilitate low-income countries' access to such instruments: financing premia through grants; underwriting repayment guarantees to mitigate credit risk; offering technical assistance; and examining other, innovative ways that lower costs and improve access of hedging products for low-income countries. One promising use of hedging instruments may be for oil importing low income countries to hedge their budgetary

exposure to oil prices.<sup>40</sup> Furthermore, the FAO is examining the potential for using markets to hedge food import price spikes for low income countries.

54. **There maybe some potential to use markets for weather and natural disaster risks.** Insurance and re-insurance markets for natural disaster and weather related risks are well established in developed countries and could be extended to low income countries. These markets could provide timely access to funds following a shock and improve incentives for proactive risk management. Markets instruments could complement domestic funds that use annual appropriations to deal with more frequent but less severe risks, such as in the case of FONDEN in Mexico. Furthermore, insurance coverage at the country level for catastrophic could stimulate the development of domestic private insurance markets.

55. **At the same time low income governments can rely on external financial assistance which may be less costly compared to purchasing insurance or using market-based risk management instruments.** It is yet to be assessed whether financial assistance could be more efficiently spent in providing guarantees or co-financing premia rather than relying on supplemental financing after the shock. Issues such as speed of disbursement and developing or strengthening the capacity of governments to access markets could be some of the considerations for helping governments access risk markets.

56. **However, over-reliance on external assistance has its negative effects.** While ex-post financial assistance is important in mitigating the impact of external shocks, over-reliance of low-income countries on this is creating an environment where countries have little incentives to be more proactive in managing their risks. And in the longer run countries could be more exposed to risks as they built assets (for example, infrastructure) and population grows in disaster prone areas.

57. In sum, when shocks occur, the use of risk markets should not be considered a substitute but a complement to existing bilateral or multilateral financial assistance, particularly for shocks that unfold slowly.

## **B. Work Program For Micro-Level Commodity Risk Management Issues**

58. **At the micro level, the remaining IFI agenda on commodity risk management should focus on the following four areas:** (i) explore efficient and cost-effective channels for delivering hedging instruments to producers; (ii) offer risk management instruments that include production risks; (iii) mainstream commodity risk management into other IFI operations; and (iv) continue analytical work on the issue.

59. **Explore efficient and cost-effective delivery channels for price hedging.** The World Bank's Commodity Risk Management group technical assistance has so far led to small pilot risk hedging transactions benefiting producer organizations in various countries. But such technical assistance can be costly and time consuming. The challenge currently lies in pooling large volumes of risk from many producers in market organizations that can access insurance or

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<sup>40</sup> Several middle income countries, including Brazil, Chile and El Salvador, have in the past hedged their oil imports using market instruments. See also UNCTAD, *Second African Oil Trade Conference* (1997).

hedging markets to manage them effectively. This may involve local banks and credit institutions that provide loans for commodities or similar public or private institutions involved in commodity sector(s).<sup>41</sup> Furthermore, the risk management project needs to seek synergies with other measures to assist risk management broadly and deepen rural financial systems, including making credit/savings services available to rural areas, improving storage markets (for example, warehouse receipt systems), implementing regulations for contract enforcement, and improving market information systems.

**60. Offer risk management instruments for production-related risks.** On production risks, approaches based on traditional crop insurance are not appropriate for low income countries due to the usual moral hazard and adverse selection problems, the high administrative costs, and also because local institutions needed to implement crop insurance tend to have little capacity for such complex tasks. The Commodity Risk Management group at the World Bank is in the early stages of assessing the feasibility for using alternative approaches to finance production risks that are severe and systemic. One such experimental approach is based on the use of weather risk markets in client countries.<sup>42</sup> Implementation on a pilot basis has already started, with small initial transactions in the agricultural sector in Mexico and recently in India, while some additional transactions are under preparation in Morocco and Ukraine. The World Bank's contribution has been through feasibility studies (with funding through a Development Marketplace Project), through ESW (India and Mexico) and, in the cases of Mongolia and Ukraine, as a possible component of a Bank loan and IFC project respectively. The few transactions accomplished so far are relatively small, but they show potential which the World Bank should continue to explore and perhaps scale up after this initial phase. Related to this, is to explore options for using weather-based triggers to improve public response to covariate climatic shocks.

**61. Conduct further analytical and policy work on key issues.** First, further analysis is needed of the interaction between formal and informal markets to manage risks. In particular, the use of markets for strengthening mutual insurance and other types of informal arrangements. Second, the analysis of the workings of internal food markets, particularly in African countries, and the alternatives for dealing with domestic food price volatility. Third, analysis of the costs and benefits of combining price and production risk management products to create a revenue insurance product. Fourth, analysis to establish the relative importance of price and production/weather risks in triggering loan defaults and quantifying the magnitudes of potential benefits for lenders and borrowers from using risk markets. Fifth, explore the use of satellite imagery and other technological innovations as triggers or verification for insurance due to weather shocks.

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<sup>41</sup> For example, ASERCA in Mexico, ANACAFE in Guatemala and the government of Brazil coffee options scheme.

<sup>42</sup> The approach is based on triggering insurance payments based on the occurrence of specific weather events (low or high rainfall, temperatures, or high wind.). These events have to be measured and verified accurately and objectively. Insurance may not be confined only to weather events, but it could use other triggers, again measured accurately and verified independently. For example, instead of weather events, area-based yield could be used as a trigger for insurance payments (see Varangis, *et. al.* 2003).

## V. CONCLUSIONS

62. **Low-income countries are significantly affected by exogenous shocks, and dealing with them is an important part of the development agenda in these countries.** The global community has focussed its efforts on helping countries reduce vulnerability to exogenous shocks by taking preventive actions to diversify economies, deepening financial markets, establishing social safety nets, adopting self-insurance schemes and using market based risk mitigating instruments to the extent that these are applicable. Progress is being made on these fronts, albeit slowly, and this agenda will remain at the forefront of development efforts in the future.

63. **The global community has also played a more ad-hoc role in providing financial assistance in the aftermath of a shock.** This is less true for natural disasters, but especially evident for commodity price and other economic shocks. But given the extent of economic loss and human suffering that typically accompanies an exogenous shock, there is an urgent need to develop a more systematic mechanism, or modify existing ones, to facilitate timely, concerted and adequate financial assistance on appropriately concessional terms.

64. **The global community needs to evaluate whether existing instruments could be modified and new instruments developed to be more responsive to exogenous shocks.** The potential for financial innovation requires systematic assessment in the light of both risks and opportunity costs of concessional resources. This paper has outlined areas for further research on potential issues and instruments that need to be examined carefully if the global community is to improve the speed and effectiveness of its response to shocks in low income countries.

## **Annex I: International Instruments to Address Terms of Trade Shocks**

1. **The two main instruments that provide financial assistance in the event of terms of trade shocks are the EU's FLEX program (and its predecessors, the Stabex and Sysmin programs), and the IMF's Compensatory Financing Facility.** The EU Stabex and Sysmin programs operated between 1975-2000 and disbursed about Euro 6.1 billion in total. Stabex aimed at providing compensation for shortfalls in the export earnings of the African, Caribbean and Pacific (ACP) countries for selected agricultural commodities, caused by price and/or quantity fluctuations.<sup>43</sup> The early Stabex schemes protected governments from revenue losses while domestic stabilization schemes protected farmers. With the collapse of most domestic stabilization schemes, Stabex increased conditionality to ensure that benefits trickled down to farmers, but this also slowed disbursements.<sup>44</sup> An important characteristic of Stabex was its commodity-by-commodity focus which meant that compensatory payments for a commodity could be triggered even when overall export revenues increased. The experience of Stabex shows that stabilization was achieved mainly for the export revenues of specific commodities but had a negligible impact on stabilizing total export earnings.<sup>45</sup> Furthermore, the focus on specific commodities reduced incentives for diversification. Overall, the specific commodity coverage and time lags between the occurrence of the export shortfall and the date of disbursement, caused by the complex analysis for the justification of payments<sup>46</sup>, made the operation of the system unsatisfactory and as a result Stabex has been considered in the literature more as an aid allocation than a stabilization scheme.<sup>47</sup> Sysmin, Stabex's counterpart for metals and minerals, had similar characteristics.

2. **The unsatisfactory operation of Stabex and Sysmin led the EU to establish the Fluctuations of Exports scheme (FLEX) in 2000.** FLEX aims at fast disbursement of funds to eligible countries, triggered by: (a) losses of overall export earnings from goods by more than 10 percent (2 percent in case of the least developed countries); and (b) 10 percent worsening in the programmed public deficit. When the eligibility criteria are met, a consecutive financing agreement defines the use of funds for budgetary support or contributions to sectoral programs.<sup>48</sup> Between 2000-2002, more than half of the eligible ACP countries had requested support under FLEX, but only about half fulfilled the first criterion while only about 10 percent of the applicants fulfilled the second. Overall, six countries have been declared eligible for support so far under FLEX for a total amount of support of about Euro 36 million.

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<sup>43</sup> Commodities excluded meat, sugar and tobacco. Sugar and meat were covered separately by commercial agreements for preferential access to the EU.

<sup>44</sup> One ex-post analysis found that disbursements were so slow as to be pro-cyclical, thereby amplifying the effects of commodity cycles. See R. Hermann, K. Burger, and H.P. Smit, "Commodity Policy: Price Stabilisation versus Financing"; in D.A. Sapsford and L.A. Winters (eds.) *Primary commodity Prices: Economic Models and Policy*, Cambridge University Press, Cambridge (1990).

<sup>45</sup> See Aiello 1999, Lim 1991, Brun *et al* 2001, Faber 1984, Herrman 1983, Herrman *et al* 1990

<sup>46</sup> See for example, Brun 2001

<sup>47</sup> See Hewitt 1993

<sup>48</sup> These are focal and non-focal sectors as defined in the Country Strategy Paper and National Indicative Program.

3. **The IMF has also offered compensatory financing programs for its client countries.** The Compensatory Financing Facility (CFF) provides financing to countries experiencing balance of payments difficulties resulting from a temporary decline in export revenues or a temporary increase in cereal import costs.<sup>49</sup> Declines (for exports) and increases (for imports) are calculated based on the previous five-year trend. Compensation is for the full amount of decline (or increase) limited to the country's balance of payments needs and a percentage of quota. The CFF could be used to compensate for price shocks and quantity shocks. It has been used 344 times in total mostly during the 1970s and early 1980s and mostly for export revenue shortfalls. Since its January 2000 review, however, the CFF has not been used. For low income countries its use decreased considerably following the creation of ESAF (now PRGF), under which concessional assistance could be provided through new or augmented arrangements. Furthermore, the duration of some commodity price shocks, although considered temporary, may still be too long for the CFF calculations to show a shortfall.

4. **The CFF is non-concessional and thus not particularly attractive for low income countries.**<sup>50</sup> But the IMF tends to use its general purpose financing instruments — stand-by arrangements or augmentation of the PRGF — for all types of balance of payment difficulties, including those arising from natural disasters and terms-of-trade shocks. Of 264 terms-of-trade shocks during 1981-1999, stand-by arrangements were either in place or approved in 56 cases, and in 11 of those case, parallel access was also granted to the CFF. Similarly, of 106 large natural disasters between 1977-2001, countries had stand-by arrangements in 22 cases, of which 9 were combined with CFF or emergency assistance. About half of the stand-bys were for low-income countries and the rest for middle-income countries. Of the 121 ESAF and PRGF arrangements 32 have been augmented. However, in 14 cases where the cost of the shock was estimated the results showed that the impact on BOP was about 70 percent of the quota (or 4.6 percent of GDP) while the average augmentation was only 11.6 percent of quota (or 0.7 percent of GDP).

5. **The IMF has recently proposed changes to make more consistent its financing response to shocks in low-income countries.** The options proposed include: (i) augmenting an existing PRGF in countries with programs that are on track; and (ii) subsidizing some GRA facilities in low-income countries that do not have PRGF arrangements or where programs are off-track. The first option is fairly straightforward since an existing PRGF provides a framework around which the policy response to a shock can be structured. It is currently being used, though not very frequently. To encourage its usage, cut response time to low-income countries, and ensure comparability of treatment across low-income countries it is proposed to set explicit pre-agreed principles for PRGF augmentation. The second option addresses the need to respond to countries where a pre-existing financial arrangement is not already in place, or where a comprehensive three year PRGF may be both too long and too detailed to respond to shorter-term financing needs associated with some shocks and with natural disasters. Since GRA (the Funds's regular, non-concessional window) assistance is more expensive than PRGF arrangements, it is proposed to subsidize the GRA rate of assistance for natural disasters, and to create a standby-like window within the PRGF for responding to commodity price shocks and

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<sup>49</sup> From November 1990 to December 1991, oil imports were included as a result of the sharp rise in oil prices during the Gulf War.

<sup>50</sup> The IMF's emergency assistance for natural disasters is also non-concessional.

other such shocks that are not related to natural disasters. Finally, the Fund recommends that for the weakest, most vulnerable countries, financing for shocks be provided in the form of grants by donors, and the Fund's role in such cases should be limited to drawing attention to the needs, cooperating with donors capable of providing grants, and helping to ensure that the assistance is utilized effectively.

**Annex Table 1. Emergency and rehabilitation assistance from donors and creditors**

Program/Facility by Organization	Grants/Loans	Concessional	Channel	Mitigation Focus	Conditionality	Disbursement Speed
United Nations						
Office for the Coordination of Humanitarian Assistance	Grants	—	Governments	Unknown	Unknown	Unknown
Central Emergency Revolving Fund (OCHA Program)	Loans	Unknown	NGOs	No	Unknown	Before Donor Contributions are available
UNDP	Grants	—	Unknown	Yes	Unknown	Unknown
UNHCR, WFP, UNICEF	Grants	—	Unknown	Yes (UNHCR)  Unknown (WFP, UNICEF)	Unknown	Unknown
World Bank						
Emergency Recovery Loans	Loan	Yes (if IDA eligible)	Governments	Yes	Yes (Project level)	Quick disbursing element for purchase of necessary imports; 2-3 year disbursement
European Commission						

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Program/Facility by Organization	Grants/Loans	Concessional	Channel	Mitigation Focus	Conditionality	Disbursement Speed
European Commission Humanitarian Office (ECHO)	Grants	—	NGOs UN agencies	No (but some prevention projects)	No	Within 3 days to NGOs/ UN agencies; Unknown after that
African Development Bank Special Relief Fund	Grants	—	NGOs UN agencies	No	No	Unknown
<b>Asian Development Bank</b>						
Rehabilitation Assistance to Developing Countries Affected by Natural Disasters	Loans	Yes (if AsDF eligible)	Governments	None Specified	Unknown	Average 5 months to disburse; Projects duration of less than 1 year
Rehabilitation Assistance After Disasters	Loans	Yes (if AsDF eligible)	Governments	Yes	Unknown	Projects finished within a year of disaster occurring
Inter American Development Bank Emergency Reconstruction	Loans	Both	Governments	Yes	Yes (Risk mitigation & prevention)	Loans approved in weeks and disbursement within twelve months

**Annex Table 1. Emergency and rehabilitation assistance from donors and creditors**

Program/Facility by Organization	Grants/Loans	Concessional	Channel	Mitigation Focus	Conditionality	Disbursement Speed
Disaster Prevention Sector Facility	Loans	Unknown	Governments	Yes		
Caribbean Development Bank Caribbean Disaster Emergency Relief Funds	Both	Yes	Governments	No	Yes (Rehab)	Unknown
Disaster Mitigation Fund for the Caribbean	Grants	Unknown	Unknown	Yes		Unknown
International Monetary Fund Emergency Assistance for Natural Disasters	Loans	No (regular GRA rate)	Governments	No	Limited Macroeconomic policy	Disbursement within 2-3 months of the disaster occurring

## **Annex II Commodity Risk Management Initiative at the World Bank**

### **I. Background**

1. **During the 1990s the World Bank realized the need for smallholders to access markets for risk management instruments, an issue that grew in importance with market liberalization and the globalization of commodity marketing.** In 1999, the World Bank initiated a project to make price risk management instruments available to smallholder farmers, through cooperatives, producer organizations, traders, banks, and other rural financial institutions. This initiative is supported financially by several donor governments (the European Union, the Netherlands, and Switzerland), and is undertaken in collaboration with other international organizations and private sector representatives under the umbrella of the International Task Force on Commodity Risk Management (ITF). The initiative is described in ITF (1999). The role of the World Bank is that of a facilitator, providing technical assistance and capacity-building to farmers and intermediary institutions that link farmers to risk management markets. Hedging transactions are strictly commercial and take place between the local institution and the provider (seller) of price risk management instruments. Following three years of research and analytical work, the project entered the implementation phase in 2002. Current and ongoing activities of the Commodity Risk Management (CRM) initiative are described below.

### **II. Current and on going Activities**

2. **Current and on going activities extend to various countries and commodities (Appendix Table 1).** CRM has a presence in every region of World Bank operations, with the strongest area of concentration being Africa. Coffee, cocoa, and cotton represent the commodities most dominant in current operations, but the project is beginning to get more involved in grains and other products. The current work on risk management has two main areas: price and production/weather risks. Work on production/weather risks is focused on large systemic risks affecting the agricultural sector and involve the use of insurance and weather markets. The project's work is demand-driven, which means that resources are focused in areas where governments, producer organizations, or private sector institutions have asked for assistance. CRM continues to look actively for new cases and opportunities to mainstream its work within the Bank Group.

3. **CRM test cases are categorized into two types:** 1) feasibility reports which assess the potential for using market-based risk management instruments to solve particular problems of commodity risk and 2) implementation work which involves technical assistance and testing the application of market products in managing such risk.

4. **A feasibility assessment is carried out in the context of a specific country and commodity.** It lays the groundwork for pilot project(s) using specific risk management solutions, if such an approach is found to be potentially feasible. Feasibility reports usually include a review of the particular country/commodity sector, description of the commercial chain, interviews with all market actors, identification of price or weather risk and its impact on the sector, description of regulatory issues, and conclusions on whether or not market-based risk management instruments would be appropriate and/or practical in the environment. Ongoing feasibility work examines a wide range of commodity risk problems, from the impact of weather (drought) risks on grains in Malawi and Zambia, to an attempt to explore alternatives for

commodity trade financing for cocoa producer organizations in the Dominican Republic, to examining the link between microfinance lending and commodity risks in Peru. In summary, the overall objective of the feasibility assessments is to identify, within a broad range of commercial settings, areas where commodity risks impact developing country institutions and where market-based solutions might be put to use.

5. **Implementation work consists of technical assistance which aims to strengthen the capacity of local institutions to understand the impact of commodity risks and begin to solve the problems.** This involves a high degree of training and education, which is focused, selective, and directed towards enhancing business capacity in the commodity trade. Implementation solutions can take many forms. For example, as a result of working with CRM, producer organizations have made decisions to change the way they fix prices and sell their product, have successfully negotiated with physical buyers to incorporate minimum price guarantees into physical contracts, and have entered the market to purchase financial instruments with overseas commodities brokers or insurance companies. In Tanzania, a local bank has made price risk management of clients a business priority, and a precondition for borrowing at lower interest rates and in India, the Coffee Board has determined that growers with access to price protection instruments will be less likely to default on loans from local banks, a problem which in past years has required Coffee Board attention. The objective of this implementation work is strengthening institutions within the agricultural sector to be able to identify and select from a range of commercial alternatives that can mitigate the problems of commodity risk.

### III. MAIN RESULTS OF CURRENT AND ONGOING ACTIVITIES

6. **The current and ongoing activities have yielded many lessons. A focus on bringing market solutions for commodity risks to smallholders is incomplete without assessing the commercial incentives for intermediate actors who must play a commercial role in delivery of the instruments.** Willingness-to-pay surveys and analytical work in the field have indicated that smallholders are willing to pay for risk management products, which for price risks is found to range from 2-5 percent of the value of the transaction. However, it is not possible to deliver risk management solutions to smallholders without the participation of intermediate institutions to aggregate demand and provide delivery channels. These intermediate actors also must have commercial incentives that motivate them to play a role. For example, cooperatives and traders strengthen their own businesses and supplier relationships by offering additional services to their members, such as risk management. Banks find it profitable to expand lending to agricultural producers if they can hedge their risks, or if they know that their borrowing clients are hedged. Thus, it is critical to establish the institutional incentives and make a business case for intermediate institutions to provide risk management instruments to smallholder producers.

7. **Implementation of risk management solutions for producer organizations strengthens financial capacity of these groups, but a narrow focus on producer organizations alone will limit impact and expansion of the work.** During the past two years, implementation work focused on the scoping of organizations of smallholder producers, such as cooperatives and farmer associations, in certain commodity sectors and countries. Many cooperatives viewed themselves as providing some price protection to their members by establishing a policy of setting a first minimum payment price at the beginning of a marketing season. This practice, which individual producers saw as positive, frequently resulted in trading losses for the organization as a whole because the first payment prices were not protected in the

market. The organization would sell product collected from members throughout the season at market prices that were constantly fluctuating, sometimes above and sometimes below the first payment price. If the cooperative as a whole made financial losses on sales and subsequently defaulted on loans from local banks, unless government intervention assisted the organization with its debt burdens and financing for continued operations, individual members were not shielded from the negative financial performance of the organization as a whole. Using price risk management instruments in these cases allows cooperatives to protect, or lock in, the market level of the first, minimum, payment price, thus protecting cash flows and the organization's ability to service debt.

8. **Although such transactions with producer organizations are quite feasible, they also have showed the need for time-consuming and specialized technical assistance.** Expanding this capacity building from one producer organization to another, even within the same country and for the same crop, has had very small economies of scale primarily because risk management solutions must be customized to a particular organization's financing, buying, and selling patterns, and there is no standard template for implementation. Furthermore, a precondition for successful implementation with producer groups is existing institutional capacity and medium-level skills in terms of management, finance and marketing. Even once a risk management strategy is identified and understood, it still requires ongoing attention by the World Bank team and the organization's management to make the appropriate decisions, for example, for buying/selling the instruments. At the producer organization level, the implementation of risk management solutions has multiplier effects in terms of strengthening local financial institutions and removing the need for government bailouts of ineffective organizations. But work with such institutions needs to be selective and focused on organizations large enough to aggregate risks from many small farmers, and capable of both understanding and executing the business. Based on these limits of the producer organization approach, the need for alternative delivery channels for risk management solutions is evident.

9. **There is a need to expand beyond producer organizations to find additional channels for delivery of risk management instruments to smallholders.** Current work indicates that banks and rural financial institutions are showing an interest in risk management instruments as a way to reduce the risks inherent in lending to agriculture. For example, a local bank in Tanzania, a micro-finance institution in India, and a rural financial institution in Peru have shown active interest in commodity risk management. The bank in Tanzania plans to offer a financial service of intermediating price risk management contracts (cotton and coffee) so that clients can hedge their price risk, and, as an incentive, clients who are hedged will receive lower interest rates on loans than those who are not. In India, a micro-finance institution has, on a pilot basis, offered to its borrowers, mainly groundnut smallholders, insurance protection against low rainfall.<sup>51</sup> Additionally, the CRM project is working with local traders in Uganda and India that could offer risk management instruments linked to purchase contracts for physical goods. Results from these ongoing pilots are still too early to evaluate.

10. **The objective of technical assistance is to see institutions implementing all types of risk management solutions, and the focus on results should incorporate more than individual transactions.** Because risk management solutions are customized, unique, and dependent on existing market and trade conditions, it is extremely difficult to forecast volumes

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<sup>51</sup> Hess (2003)

of business which may result from year to year. Transactions are opportunistic and depend to a very large extent on market conditions. They also have associated costs and benefits. Developing the ability to analyze these costs/benefits helps those exposed to risks not only make economic decisions about the purchase of such instruments, but also better understand their financial and marketing operations as a whole.

11. **Hedging transactions depend on prevailing market conditions and alternatives for risk management available at a given time.** During 2002/03 a large coffee cooperative in Tanzania used options markets to hedge about two-thirds of its price exposure, but in 2003/04 it has not repeated these transactions because of a severe deterioration of the basis risk as prices in the local auction market began to diverge from the international market prices where the options were available. Instead of hedging with options, its response to the risks of changing local market conditions was to shift more coffee to export sales, where better and less volatile prices were available. This represents a risk mitigation strategy without a financial risk management transaction. Similarly, a group of farmers in Nicaragua purchased options in 2002/3, but did not repeat the business this year because they became more savvy about marketing their product to specialty markets where high fixed prices were available. In Honduras, in 2003/04, CRM's technical assistance helped a coffee cooperative implement an overall trading strategy that combined use of risk management tools and purchase/sales strategies to improve its overall competitiveness and ability to react to changing market conditions. This cooperative, which was already successful in selling to specialty markets, used options transactions to allow it to lock in forward priced sales contracts at high levels when they were available in the market, even though the physical product had not yet been procured. In Costa Rica, a producer organization has used the knowledge and training under the technical assistance to negotiate with some of its buyers for imbedding risk management instruments into purchase contracts. In each of these cases, a different type of risk management strategy demonstrated successful application of risk management knowledge and strengthened business capacity which made creative solutions apparent.

12. **Technical assistance provided under the CRM project has broader capacity-building benefits.** The goal of CRM's technical assistance is to help producer organizations, traders, and lenders both better understand price and weather risks and find solutions to manage them. Knowledge about and ability to use risk management techniques is critical to any/all actors engaged in commodity trade and is a key component of overall business capacity. Needs for technical assistance in these areas has led the project to engage with local educational institutions so that local trainers are able to disseminate information to broader audiences within a country. For example, in Uganda the CRM project worked with SUFFICE (an EU/Government of Uganda program) and UCA (Uganda Cooperative Association) to put in place educational programs about risk management. Governments and policy makers have also shown an interest in knowledge about choices, policies and instruments that would facilitate better risk management practices. Gradually, the CRM project aims to transfer as much as possible, skills to local institutions to continue work on risk management, thus reducing reliance on experts outside the country.

13. **Companies that provide risk management instruments (for example, international commodity brokers, trading companies, banks, insurance companies, etc.) have, in general, a positive view of the CRM initiative, and view the technical assistance provided by the initiative as valuable support to the development of new and emerging markets.** In 2002 as

the project moved into implementation, the work yielded a number of important lessons with respect to the private sector provider perspective.

- The rigorous nature of know-your-client requirements, in place due to increasingly stringent anti-money laundering initiatives in the wake of the terrorist events of September 11, 2001, continues to be a time-consuming aspect of capacity-building. Before any broker or bank can take on new business with an unknown customer, particularly one in a developing country, a stringent process of due diligence is required. Although providers view the background work and relationship with CRM Group as a valuable addition to the due diligence process, they continue to require a rigorous list of background documents and proofs of identification to be in place before approving business with a new customer.
- For price risk management, having a physical trader as a provider of the instruments is often a clean solution to the problem of know-your-client restrictions and financial account opening. Physical traders operating in developing countries have solid relationships with producer organizations, and at the same time have expert knowledge of financial risk management markets and products. Physical traders can offer a stand-alone price risk management instrument, and earn commission on the trade of that financial product, or they can integrate the instrument into a contract for physical goods, thus offering the producer a risk-mitigating pricing formula. Depending on a producer organization's needs for selling the physical product, either type of contract can be attractive at different times in the season.
- For weather risk management, the supply side of the market is less developed than it is for price. Weather risk derivatives and insurance products are relatively new and the number of providers is fewer than those in the more mature market for price risk management. This will create a challenge for the weather work, but strong interest in the business from insurance companies, re-insurers, and trading companies demonstrates that the market is developing quickly.
- On both price and weather, providers are interested in commercial sustainability. Although some providers initially expressed willingness to take on small sized transactions, the high cost of administration (including due diligence reviews and structuring fees for weather) makes this type of business unprofitable and providers have stressed that the scale of the business needs to increase for it to be commercially viable. This reinforces the lesson about producer organizations mentioned above, since a narrow focus on this type of institution alone is not going to generate the size of business necessary to retain the participation of the private sector providers. As a result, providers support a strategy of pursuing any and all channels for delivery of price risk instruments, with an emphasis on large scale and/or wide scope in terms of volumes and types of commodities.

14. **There is demand to expand to other areas such as weather/output risks and commodity financing.** Ongoing field work has shown the need to deal with output related risks, particularly caused by adverse weather conditions. The project has already responded by initiating activities in the area of weather/area-yield risk management in various countries including Ethiopia, India, Southern Africa (Malawi, Zambia) and Ukraine. In addition to the technical feasibility for weather/area-yield risk management products, projects in this area

analyze institutional incentives to purchase such products. One question being explored is whether risk management products could provide financing for social safety nets in response to severe adverse weather events, such as severe drought.<sup>52</sup> Furthermore, the project explores risk management in the context of structuring financing for commodities, particularly in cooperation with IFC.

15. **There is demand to link the CRM work with other World Bank/IFC initiatives and projects.** Commodity risk management work is featured in Country Assistance Strategies, lending projects and Economic and Sector Work. Broader commodity work is benefiting from the expertise of staff and consultants involved in the CRM initiative. Beyond the World Bank/IFC, CRM work can be viewed as complementary to activities of other international organizations in the areas of agricultural commodities (for example, FAO, UNCTAD, CFC, WFP) and also donor activities (for example, EU, Netherlands, Switzerland, UK-DFID, USAID).

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<sup>52</sup> This work is a joint project with the Africa Region at the World Bank

**Table A1 Commodity Risk Management Current and Ongoing Activities**

Country	Crops	Implementation			Institutions Involved
		Feasibility	Price	Weather	
<b>Sub-Saharan Africa</b>					
Uganda	coffee, cotton	X	X		producer organization; trader
Tanzania	coffee, cotton	X	X		producer organization; bank
Ethiopia	various	X			to be determined
Cameroon	coffee, cocoa	X			producer organization
Kenya	coffee, cotton	X			TBD
Malawi	grains	X			to be determined
Zambia	grains	X			to be determined
<b>East Asia &amp; the Pacific</b>					
Vietnam	coffee, rubber	X			government
Indonesia/Thailand	palm oil, rubber	X			to be determined
<b>Europe &amp; Central Asia</b>					
Ukraine	grains	X			insurance company
<b>Latin America &amp; the Caribbean</b>					
Nicaragua	coffee	X	X		government; donor
Dominican Republic	cocoa	X			producer organization
Costa Rica	coffee	X			producer organization
Honduras	coffee	X	X		producer organization
Peru	coffee, cotton, cocoa	X			producer organization; bank
<b>Middle East &amp; North Africa</b>					
Morocco	grains	X			insurance company
<b>South Asia</b>					
India	groundnuts, coffee	X	X	X	coffee board (govt), MFI, insurance, bank

### **Annex III Shocks and Safety Nets**

1. **It is important to identify and strengthen safety nets before shocks occur.** In addition to risk markets, safety nets could provide effective protection to households exposed to risks. Safety nets are needed, particularly for poor households that have no access and cannot afford market instruments. Several types of safety nets have been used with various degrees of success. These include workfare (e.g. Trabajar in Argentina), conditional cash transfers (e.g. PROGRESA in Mexico and RPS in Nicaragua), and de-coupled agricultural transfers (e.g. PROCAMPO in Mexico and DIS in Turkey). The choice of the type of social protection program depends on the specific type of shock and the type of affected group. For example, if the shock has resulted in open unemployment then a workfare program may be appropriate. If the shock has led to declining returns to self-employment, or has caused liquidity constraints (e.g. causing secondary impacts on children's human capital), then time-limited cash transfer programs may be appropriate.

2. **Safety nets implemented in response to shocks should not be developed ad hoc but rather as part of broader social protection strategies at the country level.** Also, because of government fiscal constraints, timely identification of affected groups and targeting of interventions becomes critical. In some settings, it may make sense to build on existing institutional capacity, developing the ability to scale-up programs for a defined limited period of time during the crisis.

3. **The design of appropriate safety net instruments needs to assure that there is an appropriate incentive structure.** For example, cash transfer programs should be time-bound so as not to discourage households from making needed adjustments and adopting prudent risk management practices. Safety net programs should not crowd-out potential markets for risk management.

4. **The role of safety nets is even more critical when it comes to natural disasters.** Governments can often play a role in providing catastrophic coverage against low frequency but high severity natural disaster events that affect agricultural production, and for which market insurance is not likely to be feasible, e.g., severe droughts, floods, and freezes. Governments can finance post disaster recovery operations, provide safety net programs (e.g. public works, temporary employment programs, food aid, etc.) to facilitate households' recovery after a natural disaster shock. For example, in Mexico, the government through FONDEN provides funding in response to natural disasters for repairing public infrastructure. Also, an important component of FONDEN releases funds in cases of severe droughts and floods, which states can use to provide direct payments to farmers and to finance temporary programs, e.g., PET, a self-targeting work program to improve public infrastructure and soil and forest resources.

5. **The challenge in low income countries is to find ways to provide cost effective safety nets.** There are certain key lessons for establishing safety nets in low income countries.<sup>53</sup> First,

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<sup>53</sup> See W. Smith and K. Subbarao (2003): "What Role for Safety Net Transfers in Low Income Countries?" Social Protection Discussion Paper Series No. 0301. Smith and Subbarao provide various examples of safety net programs in low income countries.

safety net expenditures need also to finance some productive investments to contribute to longer-term poverty reduction. Second, pure transfer programs need to target very selective groups. Third, programs need to have multiplier effects and leverage funds to help households reduce risks and/or diversify activities. Fourth, to deal with information problems, programs need to be self-targeting. Fifth, the timing of these programs is important to provide counter-cyclical funding following shocks. Finally, programs need to be kept as simple as possible to deal with the administrative constraints in low income countries. For example, avoiding multiple, overlapping programs in favor of one or two simple programs that could be easily implementable.