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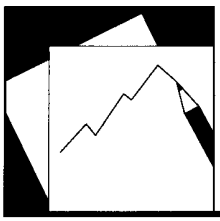

IMF Working Paper

"International Reserves in Low Income Countries: Have They Served as Buffers?"

Valerio Crispolti and George Tsibouris

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IMF Working Paper

African Department

International Reserves in Low Income Countries: Have They Served as Buffers?

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Authorized for distribution by Johannes Mueller

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Abstract

This paper provides a historical perspective on the role of international reserves in low-income countries as a cushion against large external shocks over the last three decades—including the current global crisis. The results suggest that international reserves have played a role in buffering external shocks, with the resulting macroeconomic costs varying with the nature of the shock, the economy's structural characteristics, and the level of reserves.

JEL Classification Numbers: O11, F41, O24

Keywords: Reserve adequacy, exogenous shocks, low income countries

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Contents Page

Figures

Tables

I. INTRODUCTION

1. **This paper is part of the International Monetary Fund's multi-departmental research project to study reserve adequacy in low income countries (LICs)**.[1] It provides a historical perspective on the role of international reserves as a buffer against large external shocks over the course of the last three decades—including the current global crisis. In particular, the paper seeks to assess whether the macroeconomic costs associated with external shocks were larger in LICs that had lower international reserve holdings prior to a shock event. The following questions are thus addressed: (i) what are the relevant external shock episodes in LICs?; (ii) what are the macroeconomic costs associated with them?; (iii) do such costs vary depending on structural characteristics of the economy, including the level of international reserves?

2. **Recent studies on LICs suggest that international reserves may effectively help limit the macroeconomic volatility stemming from exogenous shocks.** Though LICs are subject to a wide variety of shocks, it is generally recognized that they are particularly vulnerable to external shocks and natural disasters (Becker et al. 2007). Moreover, the economic costs associated with such shocks are large and seem to vary with the structural characteristics of the economy (Berg et al., 2011). Against this background, international reserves may play an important role in mitigating the impact of shocks and containing macroeconomic volatility (IMF, 2011; Drummond and Dhasmana, 2008).

3. **The paper extends previous research on the role of international reserves by examining a wide range of external shocks over the last three decades and by differentiating LICs according to their structural characteristics.** For the period 1980–2007, an event-study analysis approach is used to determine the losses in terms of forgone growth of real GDP and consumption per capita associated with different types of shocks (i.e. external-demand, terms-of-trade, climatic, FDI, and aid shocks) and structural characteristics of the economy (i.e. exchange rate regime, export and import concentration, level of indebtedness, and presence of an IMF program). Such losses were then compared across countries with different international reserve holdings in the year prior to the shock episode. For the current crisis period (2008–2010), a four-year event window centered in 2008 was used to assess the impact of the current crisis on several key macroeconomic variables, including real GDP, real per-capita consumption, real per-capita investment, and external current account.

4. **The structure of the paper is as follows**. Section II describes the methodology used to identify shock episodes during the period 1980–2007, presents the results of the event study analysis for LICs, and checks for robustness. Section III focuses on the current global crisis (2008–2010). Section IV provides concluding remarks.

[1] In this study, "low-income countries" refers to all countries shown on the IMF's list of countries eligible for the Poverty Reduction and Growth Trust (PRGT) at end-December 2010.

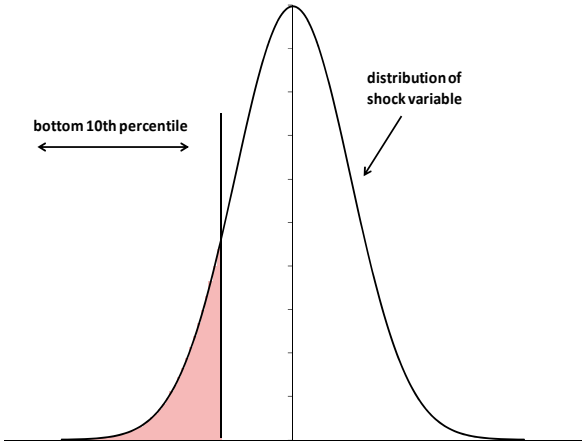
II. II. Event Study Analysis: 1980–2007

5. **This section evaluates the macroeconomic consequences of a range of external shocks faced by LICs in relation to their levels of reserve coverage during the period 1980–2007**. For each country, shock episodes are identified and associated macroeconomic costs are derived, while differentiating LICs by their structural characteristics, such as the exchange rate regime, export and import concentration, debt levels, and the presence of a financial arrangement with the International Monetary Fund (IMF).

A. Methodology

6. **An external shock event is defined as a "significant worsening" in a country's climatic conditions, terms of trade, external demand, FDI, or aid inflows**.[2] More precisely, a shock occurs if the annual percentage change of the shock variable (e.g. terms of trade) falls below the bottom 10th percentile of its country-specific distribution (Figure 1).[3,4] While alternative definitions of shock events exist in literature, this one presents several advantages including: (i) controlling for heterogeneity among LICs by using country-specific distributions; (ii) capturing rare events by focusing on the bottom 10th percentile of distribution for the shock variable; and (iii) centering the analysis on the reaction to the shock by assuming the same frequency of shocks for each country.[5]

Figure 1: Definition of Shock Episodes



[2] Changes in the external demand are proxied by real GDP growth in trading partner economies.

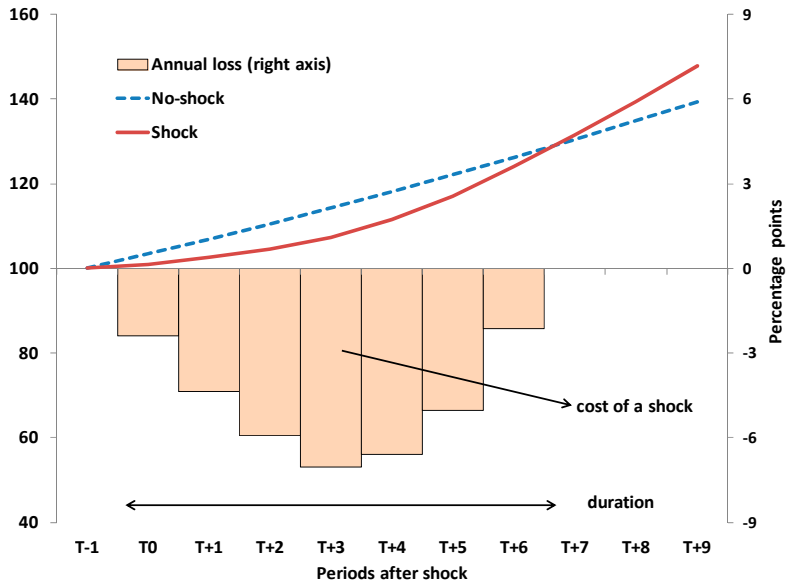
[3] The following simplifying assumptions were made to determine shock events: (i) the country-specific distributions of shock variables are independent across shocks and countries (i.e. the variance-covariance matrix of shock variables for the whole sample is block diagonal); (ii) for a given shock variable, shock episodes that are contiguous or less than three years apart pertain to the same episode occurring in the earliest relevant year.

[4] To limit the impact of outliers on the analysis, the 10th percentile threshold is obtained from the country-specific distribution by excluding the 1st and 99th percentiles.

[5] Assuming the same frequency of shocks for each economy implies that any country in the sample is equally likely to face a shock. Alternative definitions of a shock event are considered in section II.E.

7. **For each shock event, the analysis identifies its economic impact and measures its cost in terms of forgone growth of real GDP and per-capita consumption**.[6] In particular, the economic impact of a shock was evaluated by means of a five-year event window capturing the behavior of the relevant macroeconomic variables from one year before the shock episode to three years after. By contrast, the economic cost associated with a shock was determined as the cumulated sum of the estimated growth losses with respect to pre-shock trends over the years following a shock episode.[7] The estimated growth loss in terms of GDP or per-capita consumption is computed as the negative difference between their "shock" growth index—based on actual growth—and the "no-shock" growth index—reflecting trend growth (Figure 2).[8] The number of years in which a country experienced a loss may be interpreted as a measure of duration of the economic cost associated with a shock. Both the impact and the cost of shocks in LICs were examined by differentiating along the structural characteristics of the economy, including the exchange rate regime, export and import concentration, debt levels, and the presence of an IMF program.[9]

Figure 2: Identifying the Cost Associated with a Shock[1]



[1] A negative number represents a loss. The cumulated sum of the annual losses represents the cost in percentage points associated with a shock. In this example, the duration is seven years.

[6] The economic impact and costs of shocks are assessed without controlling for the presence of combined-shock episodes (i.e. instances in which two or more shocks of different nature happen simultaneously). While this may lead to overemphasize annual losses associated with shock events, combined shocks were not very frequent in the sample as one out of six shock years featured two simultaneous shocks and one out of thirty featured three simultaneous shocks.

[7] The pre-shock trend is defined as the average growth rate of the relevant variable in the three years preceding the shock event.

[8] By construction, both indices take on the value 100 in the year preceding the shock. Subsequently, the "no-shock" index increases at a constant rate determined by the variable's pre-shock trend growth; whereas, the "shock" index follows actual growth after the shock has occurred. As a result, the difference between the two indices represents the loss in percentage points of growth.

[9] The exchange rate classification here follows Ghosh et al. (2002) and the relevant regime is the one prevailing in the year before the shock event. The presence of a program with the IMF is assessed during the period ranging from a year prior to the shock to three years after; countries were then differentiated depending on

(continued…)

B. Anatomy of Shocks

8. **Between 1980 and 2007 LICs were confronted with a large shock event every ten years on average** (Table 1).[10] The likelihood of a shock to FDI inflows was about sixteen percent, while that of a significant worsening in the climatic conditions or the terms of trade was respectively thirteen and eleven percent. By contrast, shocks to external demand were less frequent. The size of shocks varied depending on their nature. Typically, shocks to external demand and terms of trade had a magnitude of about two standard deviations from the sample mean.[11] On the other hand, aid and FDI shocks had a somewhat smaller size, about one standard deviation equivalent to a decline of 5 and 3 percentage points of GDP respectively.

Table 1: Frequency and Size of Shocks
(average values)

Shocks	**Frequency**		**Size**	
	episodes	*in % of country observations*	*in % change*	*in std. deviations*
External demand	145	8.3	1.4	-1.47
Terms of trade	180	11.0	-28.9	-1.72
FDI	147	15.6	-3.0 [1]	-1.36
Climatic conditions	196	12.5	n.a.	n.a.
Aid	195	11.2	-4.6 [1]	-1.24

[1] Changes in percentage points of GDP.
Source: April 2010 WEO, IMF.

9. **The geographical distribution of shocks showed noteworthy differences** (Table 2). Shocks to external demand occurred more frequently in the Middle East, East Asia, and Sub-Saharan Africa. On the other hand, significant changes in the terms of trade and climatic conditions were more likely to happen in the Middle East and East Asia; while, FDI shocks were prominent in South Asia and Sub-Saharan Africa. Finally, drops in aid flows were important in Eastern Europe and Latin America. In terms of size, external demand shocks amounted to almost two standard deviations in Eastern Europe and Middle East; while,

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whether they had a program with the IMF (i.e. either in the year of the shock or the one before) or no arrangement at all.

[10] While this result is a straightforward consequence of the definition of shock used in the analysis, the actual frequency of shocks in the sample may differ from 10 percent (i.e. a shock every ten years) because of the adjustments mentioned in footnote 3 and 4.

[11] This implies a fall in relative prices of about 29 percent under in the case of a terms-of-trade shock.

shocks to the terms of trade were relatively larger in Middle East, Latin America, and Sub-Saharan Africa. By contrast, the size of FDI and aid shocks significantly exceeded the sample average in East and South Asia, as well as in Latin America.

Table 2: Frequency and Size of Shocks by Region

(average values)

Shocks	Frequency		Size		Frequency		Size		Frequency		Size	
	episodes	*in % of country observations*	*in % change*	*in std. deviations*	*episodes*	*in % of country observations*	*in % change*	*in std. deviations*	*episodes*	*in % of country observations*	*in % change*	*in std. deviations*
	East Asia & Pacific				***Europe & Central Asia***				***Latin America & Caribbean***			
External demand	29	9.7	2.2	-1.34	8	5.4	-2.2	-1.98	17	6.9	0.7	-1.45
Terms of trade	32	12.3	-28.3	-1.60	11	8.1	-22.9	-1.62	27	11.2	-25.5	-1.77
FDI	19	14.4	-3.4 [1]	-1.42	10	13.1	-4.1 [1]	-1.41	23	11.8	-4.3 [1]	-1.43
Climatic conditions	37	14.2	n.a.	n.a.	13	8.5	n.a.	n.a.	28	14.3	n.a.	n.a.
Aid	33	11.0	-5.5 [1]	-1.41	12	14.3	-2.3 [1]	-1.03	30	12.7	-4.1 [1]	-1.58
	Middle East & North Africa				***South Asia***				***Sub-Saharan Africa***			
External demand	6	10.7	1.3	-1.85	7	5.6	1.5	-1.39	78	8.3	1.6	-1.45
Terms of trade	7	12.8	-36.8	-2.19	7	10.0	-15.4	-1.65	96	10.8	-31.2	-1.74
FDI	3	9.8	-1.9 [1]	-1.10	9	19.1	-2.7 [1]	-1.45	83	17.0	-2.5 [1]	-1.33
Climatic conditions	7	14.8	n.a.	n.a.	6	8.3	n.a.	n.a.	105	12.0	n.a.	n.a.
Aid	4	7.1	-1.7 [1]	-1.24	14	10.8	-2.9 [1]	-0.97	102	10.6	-5.1 [1]	-1.14

[1] Changes in percentage points of GDP.
Source: April 2010 WEO, IMF.

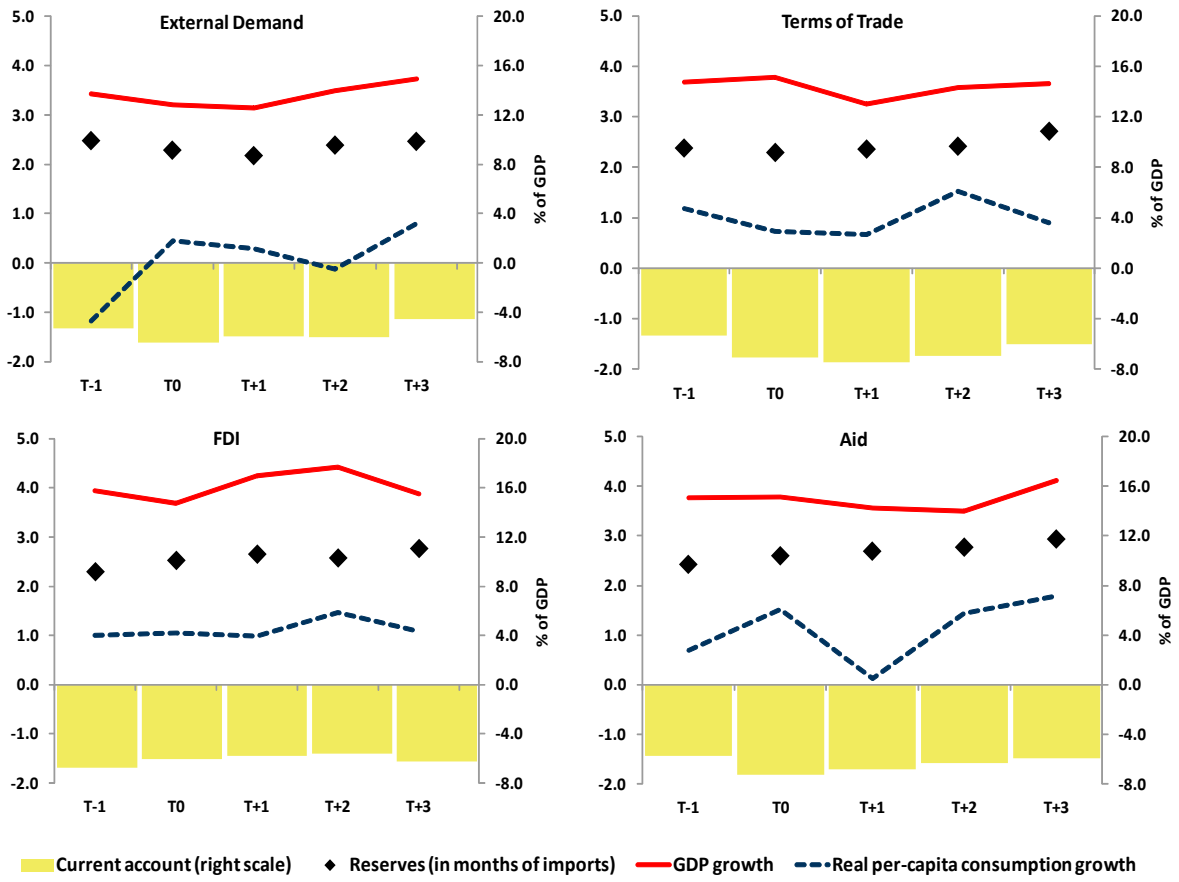
C. Macroeconomic Impact and Cost of Shocks

10. **Shock episodes were accompanied by a visible deterioration of the macroeconomic situation** (Figure 3). The median GDP growth rate decelerated in the aftermath of all types of shocks, particularly after the largest ones (i.e. terms of trade and external demand shocks).[12] Similarly, median real per-capita consumption growth remained subdued over the event window, more so in the presence of a significant worsening in external demand. Against this background, the current account deficit generally widened and remained depressed for about two years before returning to pre-shock levels. Reserve coverage in months of imports showed different trends. It fell following shocks to external demand and the terms of trade, possibly reflecting the use of international reserves to finance imports when sources of foreign exchange are limited (Table A.5). By contrast, reserve coverage increased steadily after a shock to FDI and aid flows, suggesting that, in LICs, foreign financing flows have large import content.

[12] Median values were used to minimize the impact of outliers on the results of the analysis.

Figure 3: Macroeconomic Impact of Shocks

(annual percent changes unless otherwise indicated; median values)



Source: April 2010 WEO, IMF.

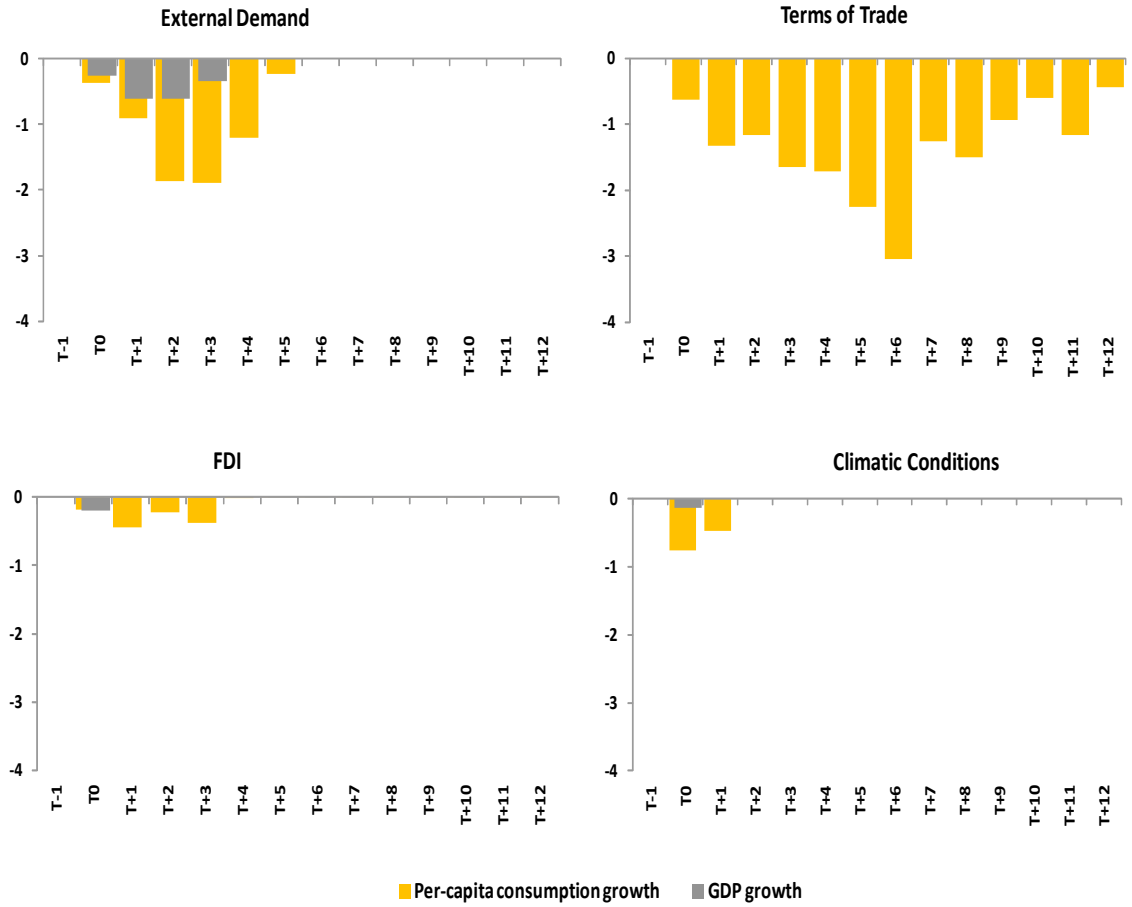
11. **Structural vulnerabilities exacerbated the impact of shocks** (Table A.5 and A.6). External demand shocks had a larger macroeconomic impact in highly-indebted and commodity-exporting economies, mainly reflecting their greater dependence on exports as source of financing. [13] After a terms-of-trade shock, countries with a fixed exchange rate regime showed a protracted slowdown in economic activity and a decline in per-capita consumption. On the other hand, the macroeconomic consequences of climatic shocks were more visible in islands and commodity-exporting countries, perhaps reflecting their fairly concentrated production base. Finally, a significant worsening in FDI and aid flows had a fairly prolonged impact in countries without an IMF program around the time of the shock episode.

[13] See Table A.2 for a definition of commodity importer/exporter and a list of the countries included in each group. Highly-indebted economies are defined as countries where the debt-to-GDP ratio was on average higher than 50 percent over the sample period.

12. **The macroeconomic costs associated with external shocks were large and persistent** (Figure 4). In presence of an external-demand shock, cumulative losses expressed as forgone GDP growth were as high as 2 percentage points of GDP over four years. The macroeconomic costs related to a significant worsening in FDI inflows and climatic conditions were typically modest, approximately 0.2 percentage points of GDP growth in a year. By contrast, shocks to the terms of trade were not accompanied by any output loss. Costs in terms of foregone growth of real per-capita consumption were larger. After a terms-of-trade shock, consumption growth remained below trend for thirteen years resulting in a cumulated loss of 18 percentage points. While this result seems to overstate the cost of terms-of-trade shocks in LICs, previous research suggests that such shocks have a prolonged impact on households' purchasing power and hence on consumption (IMF, 2008). In the case of a shock to external demand, costs amounted to 7 percentage points over six years; whereas cumulative losses were rather modest and short-lived under FDI and climatic shocks.

Figure 4: Costs by Type Shocks

(losses with respect to pre-shock trend in percentage points; median values)



Source: April 2010 WEO, IMF.

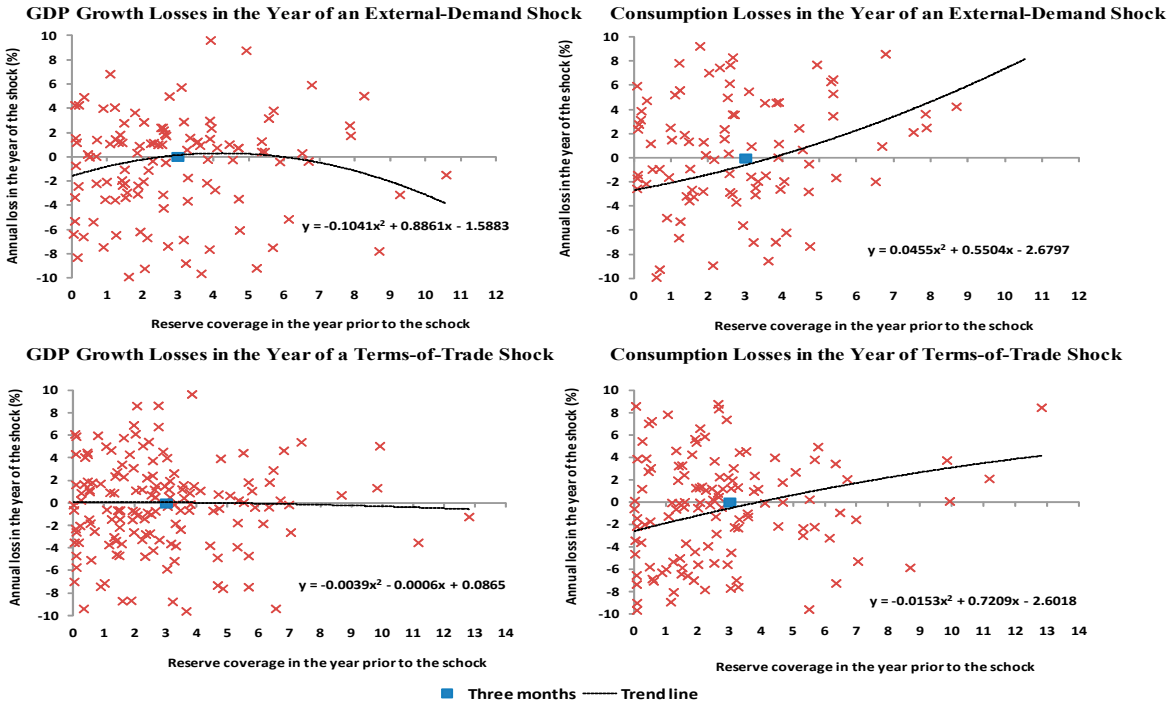
13. **The magnitude and persistence of costs varied significantly depending on the structural characteristics of the economy** (Figure A.1 and A.2). Generally, costs in terms of real GDP growth were larger and more persistent in islands, as well as commodity-exporting and -importing economies. Countries with a flexible exchange rate regime prior to a shock event showed hardly any loss, highlighting the role of exchange rate as shock absorber. Interestingly, an early program engagement with the IMF in the proximity of a shock event was generally associated with very limited losses. Finally, costs related to a worsening in climatic conditions were fairly large in island economies with cumulative losses reaching approximately 14 percentage points of GDP after a decade. The analysis in terms of real per-capita consumption growth gave similar results. Namely, countries with a fixed exchange rate regime normally suffered larger consumption losses than economies with a flexible regime—confirming previous findings on the role of the exchange rate. Also, consumption sharply dropped with respect to the pre-shock trend in commodity-exporting and -importing countries following shocks to external demand and the terms of trade. In islands and highly-indebted economies, costs associated with a significant worsening in the terms of trade exceeded 20 percentage points of consumption in ten years. Notably, the presence of an IMF-supported program did not produce tangible benefits in shielding consumption, perhaps reflecting the role played by fiscal consolidation in such arrangements.

D. The Role of International Reserves

14. **International reserves holdings helped contain the economic costs associated with an external shock.** In particular, the role of international reserves was assessed by grouping LICs according to whether their reserve coverage was strictly above or below three months of imports in the year preceding the shock event and by comparing losses between the two groups. [14] Under most shocks, annual losses declined as reserve holdings approached three months of imports, suggesting that in LICs the standard rule of thumb of three months of imports is at most a lower bound (Figure 5).

[14] It is important to stress that the threshold of three months of imports should be considered as illustrative. Alternative rules—including different thresholds for reserve coverage in month of imports or as a share of GDP—were also examined, but did not yield substantially different results. For an attempt to identify the "optimal" level of reserves in LICs, see Dabla-Norris et al. (2011).

Figure 5: Annual Losses and Level of Reserves[1]



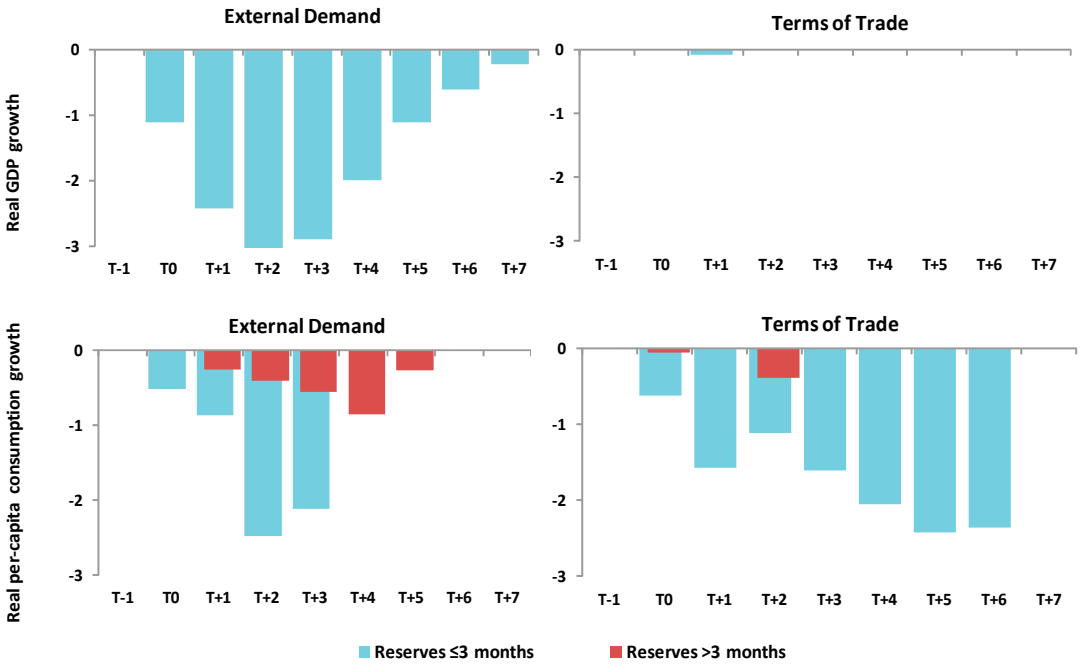
[1] A negative number represents a loss.
Source: April 2010 WEO, IMF.

15. **Countries with higher levels of international reserves in the year preceeding a shock event were able to better cushion economic activity** (Figure A.3 and A.5).[15] In terms of real GDP growth, countries with reserve coverage above three months of imports did not suffer any losses except in the case of shocks to FDI inflows (Figure 6). On the contrary, economies with less than three months of imports generally encountered significant costs—particularly in the face of an external demand shock with cumulative losses reaching approximately 13 percentage points over eight years. Higher reserves were also associated with a smoother adjustment of real per-capita consumption growth (Figure 6). Except for the case of FDI shocks, costs in terms of forgone consumption growth were generally about 2 percentage points in countries with more than three months of imports. By contrast, countries with lower reserve coverage presented an average loss of about 1 percentage point for nearly 6 years. In the case of a terms-of-trade shock, cumulative losses were more than twenty times bigger than those of economies with more than three months of imports, suggesting that benefits of entering a shock episode with higher reserve holdings may be substantial.

[15] Importantly, the comparison of costs in countries with different reserve coverage warrants caution as data limitations prevented an assessment of statistical significance.

Figure 6: Costs of External Shocks by Variable and Type of Shock

(losses computed with respect to pre-shock trend in percentage points; median values)



Source: April 2010 WEO, IMF.

16. **The structural characteristics of the economy had a bearing on the role of international reserves**. Reserve coverage above three months of imports was not a safe haven when it came to GDP losses—particularly for island economies and countries with an exchange rate peg in the face of a terms-of-trade shock (Figure A.3 and A.4). Similarly, cumulative losses were significant in oil-exporting and commodity-importing countries after a significant worsening of external demand. By contrast, reserves above three months of imports appeared to be an adequate cushion against all shocks in highly-indebted economies. In terms of per-capita consumption growth losses, international reserves seem to have allowed for consumption smoothing (Figure A.5 and A.6). Under a fixed exchange regime, costs were somewhat smaller in countries with more than three months of imports prior to the shock episode. Among countries with reserve coverage below three months of imports, losses were larger in commodity-importing countries, islands, and highly-indebted economies. Interestingly, countries without an IMF program generally experienced a more prolonged adjustment than countries with an IMF program in the proximity of a shock episode.

E. Robustness Analysis

17. **The robustness of results was determined by using alternative definitions of shocks and related losses**. In particular, shocks were redefined in terms of: (i) a different threshold (i.e. 25th percentile) to capture a broader range of events, while controlling for

heterogeneity among LICs; and (ii) a different distribution (i.e. whole-sample) to abstract from a country's specific circumstances, while maintaining the focus on rare events. Furthermore, costs associated with shocks were recomputed differentiating between "closed" and "open" events in each country in order to assess whether permanent factors might bias the analysis. A "closed" event is defined as a situation in which a country's "shock" growth index catches up with its "no-shock" index within the sample period (Figure 2). By contrast, an "open" event (corresponding to some notion of permanence) is identified by a case in which the "shock" index is consistently above or below the "no-shock" index.

18. **The results based on the 25th percentile threshold confirm previous findings**.[16] Compared to the analysis based on the 10th percentile threshold, shock episodes were more frequent and had a smaller magnitude, but their relative importance did not change significantly (Table 3). Also, the role of international reserves was broadly confirmed though the magnitude and duration of costs differed somewhat from previous analysis (Figure 7). Namely, countries with reserve coverage above three months of imports prior to the shock event did not experience any loss in terms of forgone GDP growth after an external demand shock. Similarly, countries with higher reserve buffers suffered lower consumption losses under all shocks, particularly terms of trade shocks.

Table 3: Frequency and Size of Shocks (25th Percentile)
(average values)

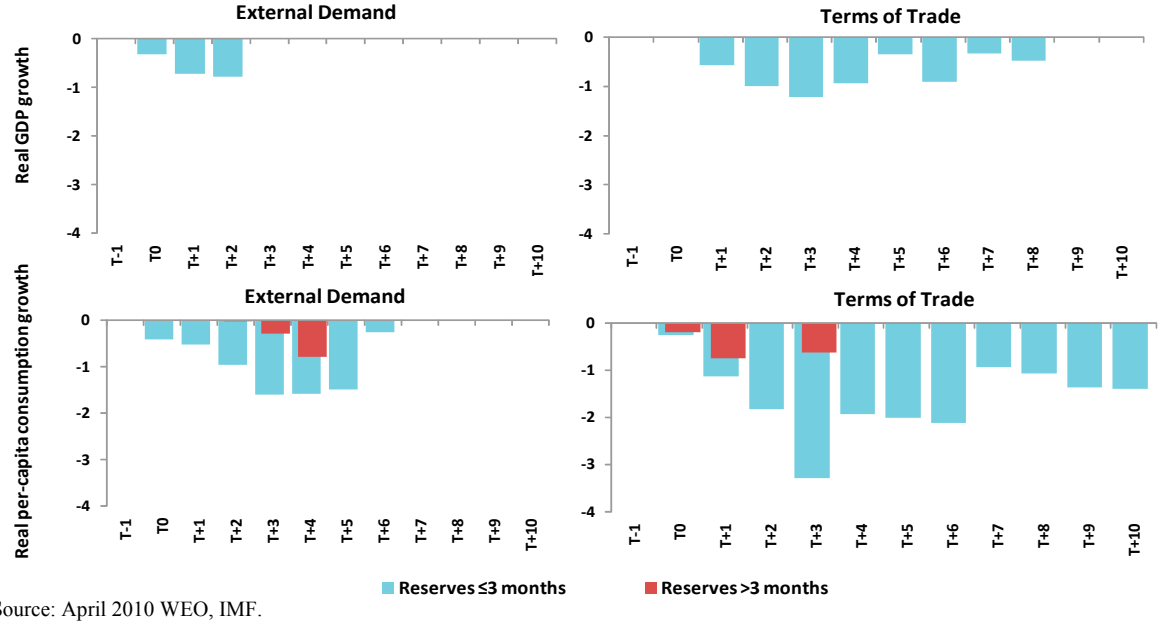
Shocks	Frequency		Size	
	episodes	*in % of country observations*	*in % change*	*in std. deviations*
External demand	216	11.9	2.0	-1.05
Terms of trade	250	15.2	-20.3	-1.19
FDI	198	20.2	-2.5 [1]	-1.04
Climatic conditions	n.a.	n.a.	n.a.	n.a.
Aid	281	15.8	-4.0 [1]	-0.92

[1]In percentage points of GDP.
Source: April 2010 WEO, IMF.

[16] Data constraints prevented the analysis of shocks to climatic conditions.

Figure 7: Costs of External Shocks by Variable and Type of Shock (25th percentile)

(losses computed with respect to pre-shock trend in percentage points; median values)



Source: April 2010 WEO, IMF.

19. **Looking at shock episodes from the entire sample distribution did not alter the results**.[17] In this case, shocks were less frequent but of larger magnitude, reflecting the fact that the bottom 10th percentile of the whole-sample distribution comprises events that are generally larger than those falling below the bottom 10th percentile of country-specific distributions (Table 4). Results based on this approach were broadly in line with the previous analysis, including on the potential role of reserves as a buffer against external shocks. Costs in terms of GDP growth were nil for countries with reserve coverage above three months of imports prior to the shock event (Figure 8). Likewise, economies with more than three months of imports were able to smooth consumption in the aftermath of shocks to the external demand and the terms of trade.

Table 4: Frequency and Size of Shocks (Whole Sample Distribution)

(average values)

Shocks	**Frequency**		**Size**	
	episodes	*in % of country observations*	*in % change*	*in std. deviations*
External demand	106	8.2	0.6	-1.53
Terms of trade	132	10.2	-35.6	-1.89
FDI	94	14.7	-3.8 [1]	-1.42
Climatic conditions	n.a.	n.a.	n.a.	n.a.
Aid	146	11.3	-5.4 [1]	-1.21

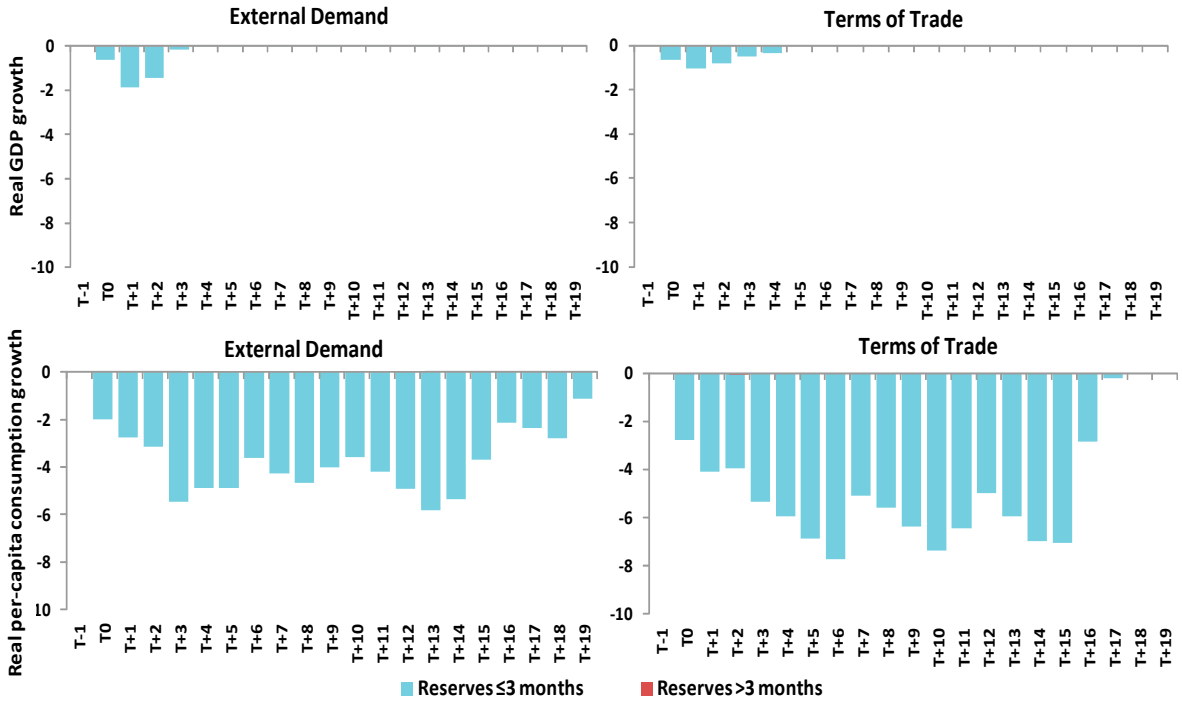
[1] In percentage points of GDP.

April 2010 WEO, IMF.

[17] The threshold used for this exercise is still the 10th percentile of the distribution. Also, data limitations prevented the analysis of shocks to climatic conditions.

Figure 8: Costs of External Shocks by Variable and Type of Shock (Whole Sample Distribution)

(losses computed with respect to pre-shock trend in percentage points; median values)

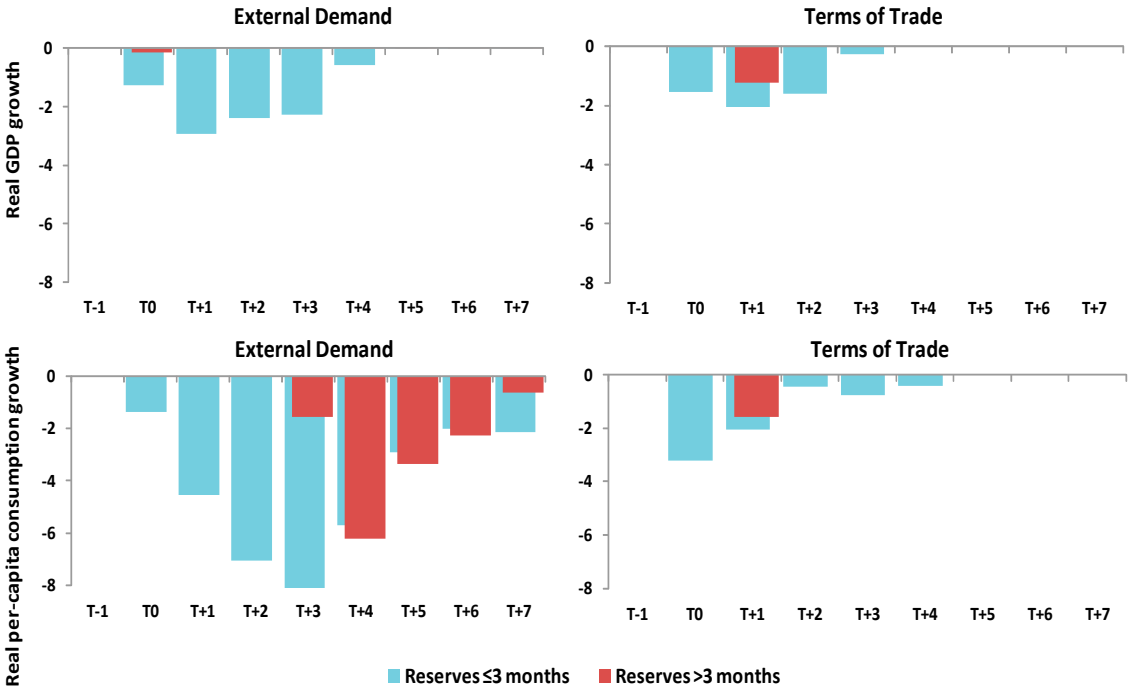


Source: April 2010 WEO, IMF.

20. **The analysis did not seem to be biased by permanent factors.** Specifically, cumulative losses associated with "closed" events were broadly consistent with those presented in section D. However, the magnitude of losses was generally smaller and their duration shorter, particularly under external-demand shocks for GDP losses and under terms-of-trade shocks for consumption losses (Figure 9). This suggests that the role of international reserves as a buffer against external shocks is not significantly affected by the inclusion of permanent factors (i.e. "open" events) in the analysis.

Figure 9: Macroeconomic Performance by Level of Reserves and Structural Characteristics ("Closed" Events)

(losses computed with respect to pre-shock trend in percentage points; median values)



Source: April 2010 WEO, IMF.

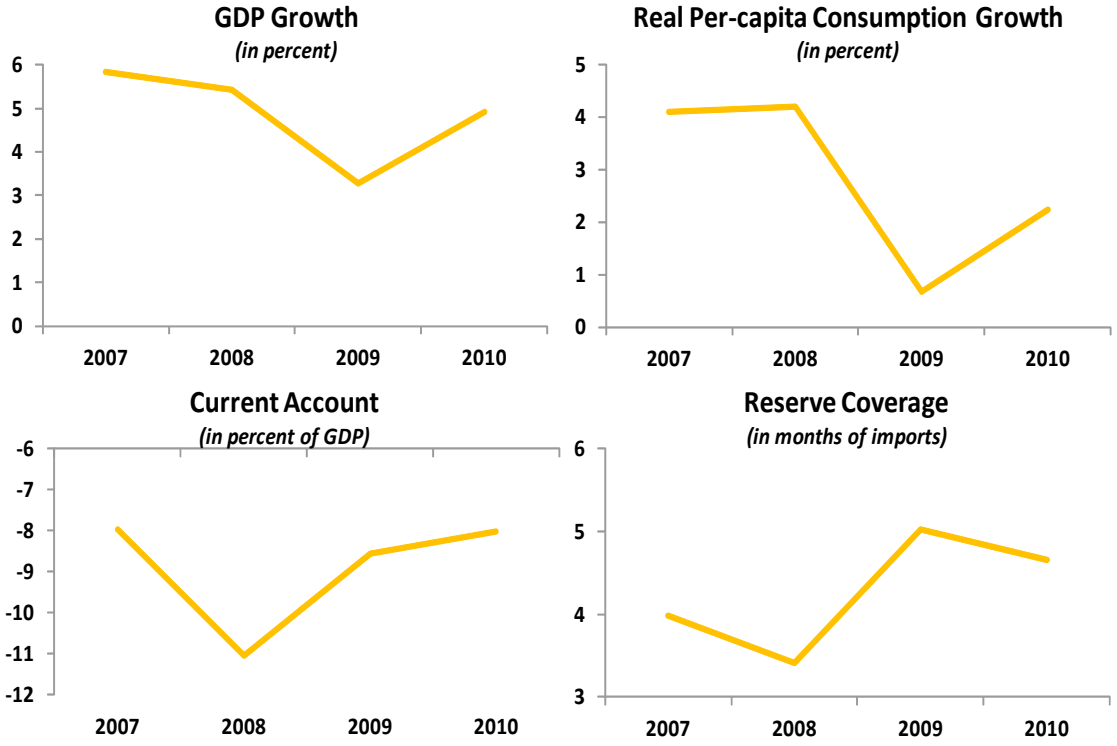
III. Global Financial Crisis: 2008–2010

21. **This section focuses on the shock episode related to the current global crisis.** Taking 2008 as the shock year, it evaluates the macroeconomic impact of the crisis and the potential role of foreign exchange reserves as a buffer against external shocks while differentiating by LICs' structural characteristics.

22. **The global crisis had a significant impact on LICs** (Figure 10). In 2008, these economies faced an unprecedented surge in oil and food prices, which increased countries' policy challenges to maintain macroeconomic stability (IMF, 2008). In 2009 and early 2010, the spillovers from the financial crisis in the advanced countries put LICs under additional strain as external demand and sources of foreign financing declined markedly (IMF, 2009). As a result, in LICs the median GDP growth and real per-capita consumption dropped by respectively 3 and more than 4 percentage points between 2007 and 2009. Also, external imbalances widened markedly. In 2008, the median current account deficit deteriorated by about 3 percentage points of GDP, mainly reflecting the sharp worsening in the terms of trade. Though international prices softened thereafter, external accounts remained under pressures due to the adverse spillovers from the global financial crisis. Against this background, median reserve coverage experienced large swings. In 2008, it fell by almost

Figure 10: Macroeconomic Impact of the Crisis

(median values)

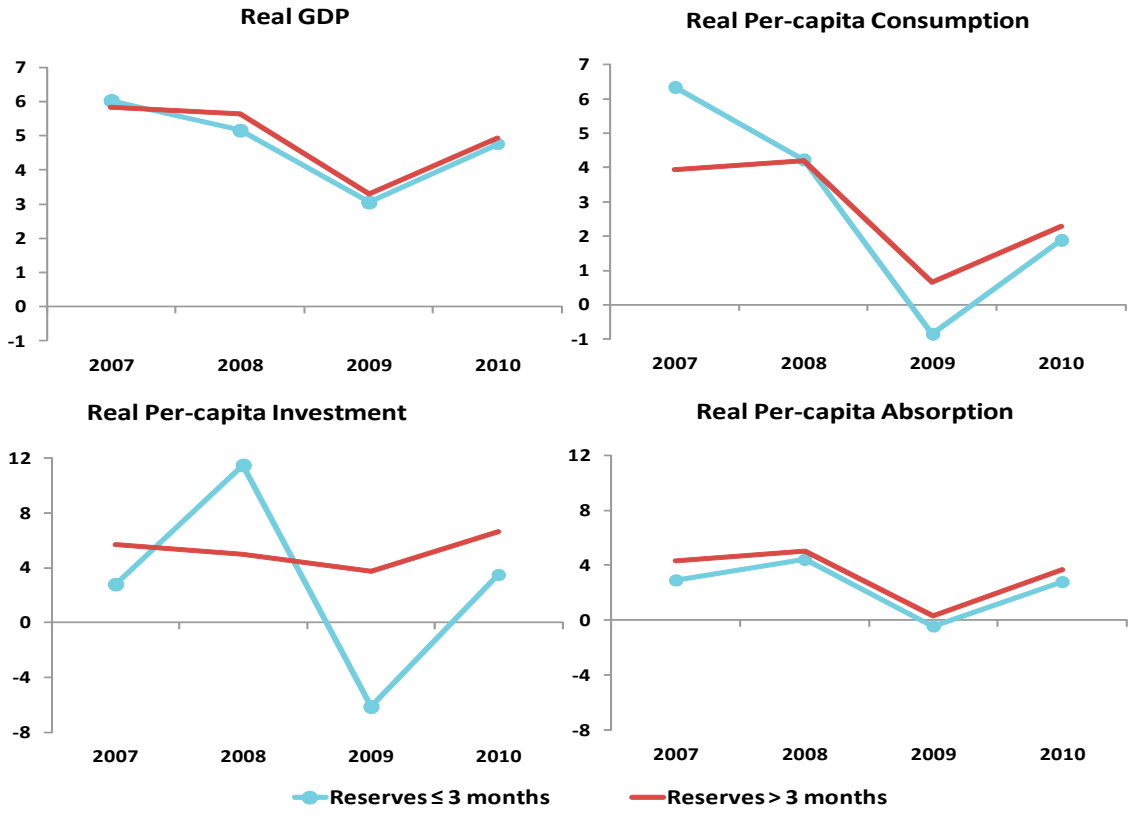


Source: September 2011 WEO, IMF.

one month of imports following a lower accumulation of international reserves and higher import prices (Table A.8).[18] In 2009, median coverage increased by one and a half months of imports as countries adjusted to the shock and the SDR allocation from the Fund became available to all IMF members.[19]

23. **International reserves helped LICs withstand the impact of the global crisis** (Figure 11). Countries that entered the crisis with reserve coverage above three months of imports were able to better buffer economic activity and to smooth consumption than economies with a lower level of international reserves in 2007. In these countries, the median accumulation of international reserves came almost to halt in 2008 falling to 3 percent (30 percent in 2007) and remaining consistently below that of economies with fewer reserves thereafter (Table A.8). Interestingly, economies with a slender level of reserves showed a sharper correction in median real per-capita investment, possibly indicating that absent a comfortable level of reserves LICs curtailed investment in an attempt to protect consumption.

Figure 11: Macroeconomic Impact of the Crisis by Level of Reserves
(median percent changes)



Source: September 2011 WEO, IMF.

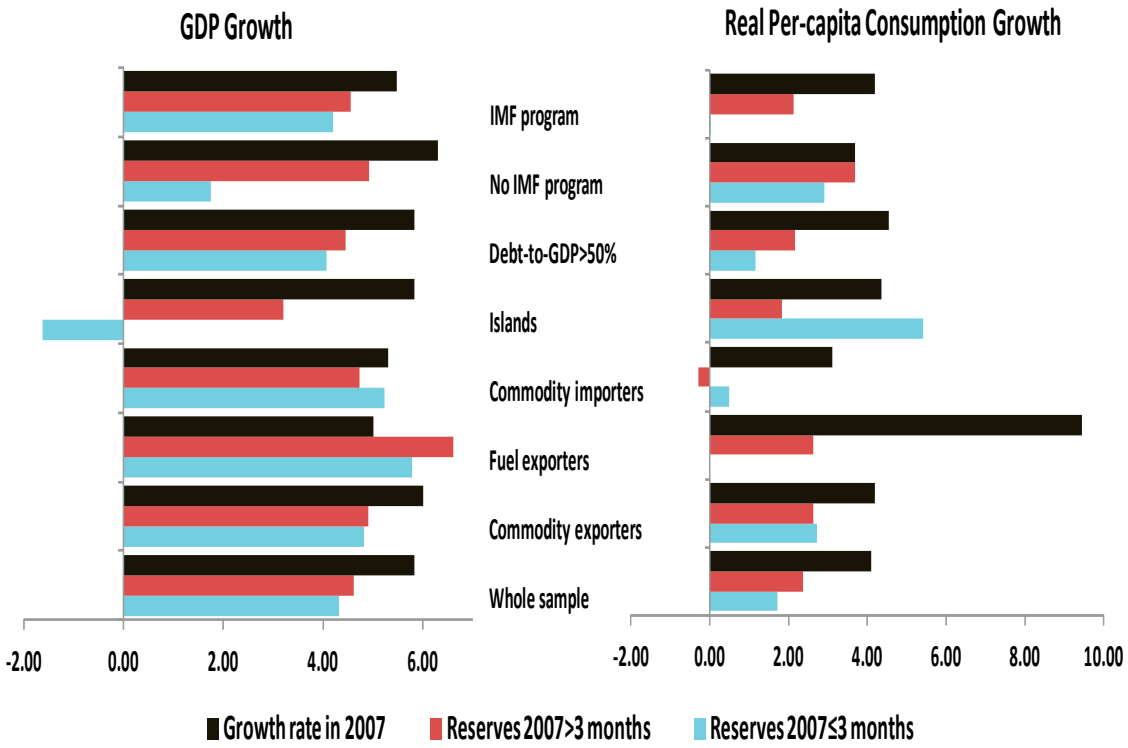
[18] This result is in line with the findings of the event study analysis for shocks to external demand and terms of trade (Table A.5).

[19] For more information on the SDR allocation in LICs see Table A.7.

24. **As in the event study analysis, the potential benefits of holding international reserves differed according to the structural characteristics of the economy** (Figure 12). Median GDP growth declined in island economies with reserve coverage below three months of imports prior to the shock event, while remaining largely positive in islands with higher reserves (Table A.7). Similarly, a rather slow pace of economic growth was experienced in countries with high debt, fairly concentrated exports, and no financial arrangement with the IMF. In terms of real per-capita consumption growth, highly-indebted countries with reserve below three months of imports confirmed their vulnerability to external shocks. By contrast, higher reserve coverage could not prevent a significant adjustment of consumption patterns in commodity-importing and island economies.

Figure 12: Macroeconomic Performance by Level of Reserves and Structural Characteristics

(average annual percent change between 2008 and 2010, unless otherwise indicated)



Source: September 2011 WEO, IMF

IV. CONCLUSIONS

25. **This paper investigates the issue of reserve adequacy in LICs**. Specifically, it examines the role of international reserves as a buffer against different types of shocks (i.e. external-demand, terms-of-trade, climatic, FDI, and aid shocks) over the last three decades. The paper expands on previous research by examining a wide variety of external shocks and explicitly taking into account LICs' different structural characteristics (i.e. exchange rate regime, export and import concentration, level of indebtedness, and presence of an IMF program).

26. **The event study analysis for 1980–2007 indicates that LICs faced large external shocks, whose macroeconomic costs varied based on the nature of the shock, the structural characteristics of the economy, and the level of international reserve holdings**. During the three years following any shock event, macroeconomic performance weakened significantly with median real GDP growth and external accounts deteriorating—particularly in countries with a high level of debt, fairly concentrated export base, and limited exchange rate flexibility. Also, costs with respect to pre-shock trends were considerable both in terms of forgone real GDP and per-capita consumption growth. After a terms-of-trade shock, costs were rather large and persistent in commodity-exporting economies (including oil-exporters), islands, and countries without an IMF program in the proximity of the shock event. Against this backdrop, countries with international reserve holdings above three months of imports in the year before the shock event were generally able to better cushion economic activity. However, higher reserve coverage was not *panacea*—especially in countries with an exchange rate peg—suggesting that the standard rule of thumb of three months of imports is at most a lower bound and that the appropriate level of reserve holdings may vary with the structural characteristics of the economy.

27. **International reserves helped LICs withstand the impact of the current global crisis (2008-2010).** As the world faced an unprecedented surge in commodity prices and the challenges faced by financial markets in advanced countries, LICs with reserve coverage above three months of imports in 2007 were able to better cushion GDP growth and consumption from the spillovers of the crisis. Nonetheless, the potential benefits of holding international reserves varied markedly depending on the structural characteristics of LICs.

V. REFERENCES

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VI. APPENDIX

This study is based on a panel of 71 LICs comprising 17 island economies, 17 commodity exporting countries, 6 oil exporters, 20 commodity importers, and 64 highly-indebted economies (Table A.1). The sample period spans from 1980 to 2007 for the event study analysis and from 2007 to 2010 for the study on the impact of the current crisis. The data used for the event study analysis (1980–2007) mainly come from the April 2010 WEO database with a few exceptions that are documented in Table A.1. To reduce the number of missing observations, historical data on per-capita consumption were reconstructed using growth rates from the Penn World Tables (version 6.3). For the current crisis period, the April 2010 WEO data were updated with the September 2011 WEO database. All computations were performed with Stata® 11/SE and all code is available on request.

Table A.1: List of Variables

Economic variable	*Unit*	*Database*	*Source*
Exchange rate regime	index	Ghosh, Gulde, and Wolf's Database (2002)	
IMF program	index	MONA	http://www.imf.org/external/np/pdr/mona/index.aspx
Current account	USD billions	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Imports	USD billions	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
International reserves	USD billions	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Real GDP growth	percent change	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Real per-capita consumption growth	percent change	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Real per-capita investment growth	percent change	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Real per-capita absorption growth	percent change	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Total debt	in percent of GDP	Lane and Milesi-Ferretti's Database (2007)	http://www.philiplane.org/EWN.html
Shock variable	***Unit***	***Database***	***Source***
Aid flows (excluding debt relief)	USD millions	OECDstat Database	http://stats.oecd.org/Index.aspx
Climatic conditions	index	The OFDA/CRED International Disaster Database	http://www.emdat.be/database
External demand	percent change	Global Economic Environment Database	IMF internal database
FDI	USD billions	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28
Terms of trade (goods only)	index	World Economic Outlook Database	http://www.imf.org/external/ns/cs.aspx?id=28

Table A.2: List of Countries and Structural Characteristics of the Economy

Country	Islands	Commodity exporters [1]	Oil exporters [1]	Commodity importers [2]	Highly-indebted [3]
Afghanistan				x	x
Armenia					x
Bangladesh					
Benin				x	x
Bhutan				x	x
Bolivia					x
Burkina Faso		x		x	
Burundi		x			x
Cambodia					x
Cameroon				x	x
Cape Verde	x				x
Central African Republic					x
Chad			x	x	x
Comoros	x			x	x
Congo, Dem. Rep. of		x		x	x
Congo, Rep.			x	x	x
Côte d'Ivoire					x
Djibouti					x
Dominica	x				x
Eritrea				x	x
Ethiopia					
Gambia, The					x
Georgia					x
Ghana					x
Grenada	x				x
Guinea		x			x
Guinea-Bissau		x			x
Guyana		x			x
Haiti	x				x
Honduras					x
Kenya					x
Kiribati	x			x	x
Kyrgyz Republic					x
Lao PDR				x	x
Lesotho					x
Liberia					x
Madagascar	x				x
Malawi		x			x
Maldives	x				x
Mali		x			x
Mauritania		x		x	x
Moldova					x
Mongolia		x			x
Mozambique		x			x
Myanmar					x
Nepal					
Nicaragua					x
Niger					x
Nigeria			x	x	x
Papua New Guinea	x	x			x
Rwanda					
São Tomé & Principe	x				x
Samoa	x				x
Senegal					x
Sierra Leone		x			x
Solomon Islands	x	x		x	x
St. Lucia	x				x
St. Vincent and the Grenadines	x				x
Sudan			x	x	x
Tajikistan				x	x
Tanzania					x
Timor-Leste	x		x	x	x
Togo					x
Tonga	x				x
Uganda					
Uzbekistan		x		x	
Vanuatu	x				x
Vietnam					x
Yemen, Rep.			x	x	x
Zambia		x			x
Zimbabwe		x			x

[1] As defined by the April 2010 World Economic Outlook.
[2] Countries that on average had a share of commodity imports to total merchandise imports exceeding 40 percent over the sample period.
[3] Countries that on average had a debt-to-GDP ratio exceeding 50 percent over the sample period.

Table A.3: Shock Variables (1980–2007)–Summary Statistics

(average percent changes)

Country	External demand	Terms of trade (goods only)	FDI	Aid excluding debt relief
Afghanistan	3.8	0.0	31.6	24.7
Armenia	2.1	n.a.	43.1	27.8
Bangladesh	2.7	-0.9	21.8	-0.6
Benin	4.8	-3.1	31.3	5.7
Bhutan	4.9	1.3	71.1	12.9
Bolivia	3.0	-0.8	0.5	4.3
Burkina Faso	5.9	-1.7	52.5	4.1
Burundi	3.0	-3.3	31.8	5.4
Cambodia	3.2	-0.7	18.3	10.1
Cameroon	3.2	0.5	9.4	7.9
Cape Verde	2.8	-1.8	12.4	5.1
Central African Republic	3.2	0.9	16.6	3.0
Chad	3.2	3.8	7.0	5.4
Comoros	3.3	-2.7	17.9	4.0
Congo, Dem. Rep. of	5.0	2.1	20.4	3.6
Congo, Rep.	5.6	3.8	30.4	-0.2
Côte d'Ivoire	3.1	1.9	18.0	-0.8
Djibouti	4.3	-1.9	26.1	4.9
Dominica	4.0	1.1	22.3	-3.5
Eritrea	3.1	-1.1	-16.8	-0.4
Ethiopia	3.1	-2.8	20.8	10.2
Gambia, The	4.5	1.1	19.8	3.3
Georgia	2.7	1.5	41.4	44.1
Ghana	2.9	-1.4	15.3	7.4
Grenada	3.2	0.4	17.5	8.5
Guinea	3.8	-0.1	36.0	7.7
Guinea-Bissau	3.8	-2.6	43.6	0.9
Guyana	2.8	-2.6	23.1	3.3
Haiti	3.1	-3.7	0.7	7.8
Honduras	2.8	-1.2	16.3	6.9
Kenya	3.3	-2.0	26.9	3.8
Kiribati	4.0	4.6	n.a.	3.3
Kyrgyz Republic	2.5	0.3	43.5	23.6
Lao PDR	5.7	2.3	12.1	7.6
Lesotho	3.3	-1.7	12.5	1.1
Liberia	3.0	n.a.	186.9	7.2
Madagascar	2.8	-3.6	22.5	5.9
Malawi	2.8	-1.5	10.2	5.3
Maldives	3.9	0.0	-0.5	10.5
Mali	5.4	-0.7	22.8	6.4
Mauritania	4.2	2.5	18.0	4.7
Moldova	2.6	-0.6	19.1	18.6
Mongolia	7.6	1.4	34.6	30.7
Mozambique	2.5	2.3	26.9	8.0
Myanmar	5.7	0.0	6.6	-2.5
Nepal	4.9	n.a.	-43.2	5.4
Nicaragua	2.9	0.5	12.0	6.8
Niger	2.7	-2.3	56.0	2.5
Nigeria	3.1	0.6	13.6	17.4
Papua New Guinea	3.9	0.1	2.9	0.2
Rwanda	4.4	-3.8	10.7	5.2
São Tomé & Principe	2.7	-6.5	24.8	11.0
Samoa	3.7	-2.8	n.a.	1.2
Senegal	3.3	-1.1	28.2	4.0
Sierra Leone	2.9	-1.2	17.3	9.3
Solomon Islands	7.2	-2.1	6.2	8.3
St. Lucia	2.8	1.7	8.1	4.3
St. Vincent and the Grenadines	3.3	-1.8	16.8	7.7
Sudan	7.5	3.4	34.3	8.6
Tajikistan	3.2	-11.0	19.2	14.8
Tanzania	3.9	-7.4	60.5	4.9
Timor-Leste	n.a.	1.2	-7.5	33.1
Togo	3.8	-4.5	-143.2	-0.2
Tonga	3.2	n.a.	n.a.	0.9
Uganda	3.0	-4.2	40.9	14.7
Uzbekistan	2.6	0.5	32.3	28.8
Vanuatu	4.9	-2.0	4.1	1.2
Vietnam	4.1	1.5	21.4	6.7
Yemen, Rep.	6.0	-2.3	13.3	3.9
Zambia	3.3	-1.1	26.9	4.3
Zimbabwe	3.2	n.a.	n.a.	12.1
Memorandum:				
LICs	*3.8*	*-0.8*	*20.9*	*8.1*
East Asia & Pacific	*4.8*	*0.3*	*11.0*	*8.4*
Europe & Central Asia	*2.6*	*-1.9*	*33.1*	*26.3*
Latin America & Caribbean	*3.1*	*-0.7*	*13.0*	*5.1*
Middle East & North Africa	*5.2*	*-2.1*	*19.7*	*4.4*
South Asia	*4.1*	*0.1*	*16.1*	*10.6*
Sub-Saharan Africa	*3.7*	*-1.1*	*24.0*	*5.6*

Source: April 2010 WEO, IMF.

Table A.4: Macroeconomic Variables (1980–2007)–Summary Statistics

(percent changes unless otherwise indicated; average values)

Country	Real GDP	Real per-capita absorption	Real per-capita consumption	Real per-capita investment	Reserves in months of imports	Reserve accumulation	CA-to-GDP (in %)
Afghanistan	11.7	1.6	2.0	-0.4	3.5	36.4	-5.3
Armenia	1.7	22.4	43.1	18.8	3.1	47.7	-7.5
Bangladesh	4.4	1.8	1.0	5.0	2.5	9.3	-1.6
Benin	3.5	0.5	1.1	-1.5	4.5	15.7	-7.4
Bhutan	7.3	6.4	5.3	7.9	11.2	12.9	-15.6
Bolivia	2.3	-0.4	-0.3	-1.6	4.5	11.0	-2.8
Burkina Faso	4.5	1.2	1.2	1.3	5.0	10.0	-5.9
Burundi	1.4	-0.6	-0.6	-1.3	5.1	2.4	-7.2
Cambodia	7.9	3.8	3.5	6.4	2.6	30.9	-3.9
Cameroon	2.9	-0.3	-0.2	-1.3	1.0	11.2	-2.0
Cape Verde	5.9	2.8	1.6	6.8	3.9	6.3	-9.3
Central African Republic	1.0	-1.7	-1.7	-1.8	4.9	2.2	-5.6
Chad	4.8	1.7	0.6	10.9	2.1	15.7	-14.3
Comoros	2.1	0.0	-0.1	1.2	5.4	9.8	-10.1
Congo, Dem. Rep. of	-0.6	-3.1	-3.1	-2.4	1.0	-0.7	-4.5
Congo, Rep.	3.8	1.8	1.4	3.4	1.1	14.0	-0.6
Côte d'Ivoire	1.8	-1.8	-1.4	-4.2	1.4	10.1	-1.2
Djibouti	0.7	-2.2	-3.4	5.5	3.4	1.7	-5.0
Dominica	3.0	2.3	2.2	2.6	1.9	6.5	-18.5
Eritrea	3.5	-1.5	-1.0	-8.5	1.1	-17.8	-2.1
Ethiopia	3.6	1.2	0.9	2.9	3.0	6.9	-2.7
Gambia, The	3.9	0.0	0.5	-2.7	3.5	15.4	-6.1
Georgia	-0.5	8.2	7.6	29.6	1.8	26.9	-8.3
Ghana	4.2	1.8	0.8	10.2	2.9	7.6	-4.3
Grenada	3.6	4.1	3.5	4.8	2.4	7.9	-15.5
Guinea	3.3	0.0	0.3	0.5	1.7	4.9	-5.3
Guinea-Bissau	2.1	-2.2	-0.5	-7.5	4.8	2.2	-7.5
Guyana	1.0	-0.1	2.4	-4.0	2.8	10.3	-19.0
Haiti	0.3	-3.7	-3.9	-2.8	1.4	7.5	-2.9
Honduras	3.3	1.0	1.0	1.1	2.1	8.9	-5.1
Kenya	3.4	0.8	0.8	1.1	2.4	6.0	-2.4
Kiribati	0.1	1.4	1.0	2.4	n.a.	n.a.	10.8
Kyrgyz Republic	0.9	2.6	2.2	5.3	3.6	20.0	-4.8
Lao PDR	6.0	4.3	3.5	7.2	1.8	34.9	-8.9
Lesotho	3.7	1.7	1.9	0.6	3.7	23.5	-19.3
Liberia	-1.0	-5.6	-5.2	-7.8	0.2	2.8	-26.7
Madagascar	1.6	-1.7	-2.1	0.2	2.3	18.3	-7.7
Malawi	2.9	0.9	2.1	-1.5	2.0	4.0	-8.0
Maldives	7.6	5.8	5.6	6.3	2.0	21.7	-6.8
Mali	3.9	1.9	1.9	1.2	3.4	18.1	-4.4
Mauritania	3.1	1.4	0.8	4.1	1.6	2.0	-11.4
Moldova	-2.0	5.9	7.8	1.1	2.5	39.6	-4.5
Mongolia	3.8	2.6	2.3	2.1	3.0	28.3	-1.3
Mozambique	4.5	0.6	0.9	-3.5	3.8	5.5	-12.7
Myanmar	6.2	3.3	2.8	6.8	2.2	8.6	-6.5
Nepal	4.2	2.4	2.2	3.3	5.3	8.8	-2.8
Nicaragua	1.7	-0.2	-0.8	4.0	2.5	7.2	-20.6
Niger	1.8	-1.3	-1.3	-1.2	3.4	5.4	-5.8
Nigeria	3.9	-0.9	-1.1	-0.1	4.7	7.9	-1.5
Papua New Guinea	2.7	0.6	1.1	-1.0	3.1	5.0	2.2
Rwanda	2.7	1.0	0.6	3.8	4.6	4.3	-5.5
São Tomé & Principe	1.5	-0.1	-0.6	2.9	3.7	3.4	-21.1
Samoa	2.1	0.3	1.0	-3.3	5.0	10.7	-4.0
Senegal	3.0	0.5	0.0	2.5	1.6	15.7	-7.6
Sierra Leone	0.2	-2.1	-2.2	-1.6	1.9	5.5	-6.4
Solomon Islands	2.1	-3.0	-3.7	1.8	3.3	4.2	-4.9
St. Lucia	3.8	1.2	0.8	3.5	1.8	10.5	-13.9
St. Vincent and the Grenadines	4.3	3.8	3.3	5.0	2.2	8.1	-14.0
Sudan	4.4	2.1	0.8	6.1	0.8	10.8	-20.0
Tajikistan	-0.8	0.7	1.5	-9.3	0.8	31.8	-6.9
Tanzania	4.0	1.0	0.8	1.2	3.0	13.4	-5.6
Timor-Leste	3.0	n.a.	n.a.	n.a.	4.0	33.3	63.7
Togo	1.3	-2.4	-1.6	-5.2	3.9	6.8	-11.6
Tonga	4.4	2.2	2.7	0.3	4.6	5.9	-2.8
Uganda	5.1	4.5	3.6	13.9	4.1	16.9	-3.7
Uzbekistan	2.7	-0.9	-0.7	-1.6	5.6	15.2	0.2
Vanuatu	3.0	0.8	0.7	1.0	3.6	6.3	0.8
Vietnam	6.4	4.9	3.7	9.3	1.4	48.7	-3.6
Yemen, Rep.	4.8	1.6	1.2	4.1	7.4	17.1	1.6
Zambia	1.7	-0.4	-0.1	-0.4	1.8	8.9	-9.3
Zimbabwe	-3.8	-0.7	-0.7	-0.2	1.4	3.5	-10.5
Memorandum:							
LICs	*3.0*	*1.2*	*1.5*	*2.1*	*3.1*	*12.6*	*-6.1*
East Asia & Pacific	*4.0*	*1.9*	*1.7*	*3.0*	*3.1*	*19.7*	*3.5*
Europe & Central Asia	*0.3*	*6.5*	*10.3*	*7.3*	*2.9*	*30.2*	*-5.3*
Latin America & Caribbean	*2.6*	*0.9*	*0.9*	*1.4*	*2.4*	*8.7*	*-12.5*
Middle East & North Africa	*2.7*	*-0.3*	*-1.1*	*4.8*	*5.4*	*9.4*	*-1.7*
South Asia	*7.1*	*3.6*	*3.2*	*4.4*	*4.9*	*17.8*	*-6.4*
Sub-Saharan Africa	*2.7*	*0.0*	*0.0*	*0.6*	*2.9*	*8.1*	*-8.0*

Source: April 2010 WEO, IMF.

Table A.5: Macroeconomic Impact of Shocks

(annual percent changes unless otherwise indicated; median values)

	External Demand					Terms of Trade					Climatic Conditions					FDI					Aid				
	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3
	Whole sample																								
GDP growth	3.4	3.2	3.1	3.5	3.7	3.7	3.8	3.2	3.6	3.6	3.2	2.9	3.7	3.8	3.7	3.9	3.7	4.2	4.4	3.9	3.8	3.8	3.6	3.5	4.1
Real per-capita consumption growth	-1.2	0.4	0.3	-0.1	0.8	1.2	0.7	0.7	1.5	0.9	0.1	-0.2	0.9	1.4	1.2	1.0	1.1	1.0	1.5	1.1	0.7	1.5	0.1	1.4	1.8
Real per-capita investment growth	-0.6	2.4	-2.1	1.0	1.5	2.7	2.3	0.1	3.2	2.1	2.6	1.9	0.6	0.3	0.1	3.2	4.7	2.8	3.8	1.8	2.8	1.0	3.0	3.3	3.9
Real per-capita absorption growth	-1.4	1.0	-0.3	0.4	0.8	2.1	0.9	0.6	1.6	0.4	0.7	0.6	1.3	1.0	0.9	1.6	1.6	0.9	2.0	0.9	0.9	1.2	0.8	1.4	1.9
Reserves (in months of imports)	2.5	2.3	2.2	2.4	2.5	2.4	2.3	2.4	2.4	2.7	2.1	2.3	2.5	2.4	2.7	2.3	2.5	2.6	2.6	2.8	2.4	2.6	2.7	2.8	2.9
Reserves (percentage change)	9.6	5.2	4.8	9.9	8.9	9.1	6.2	6.0	9.9	8.5	7.9	8.9	5.8	6.1	9.5	13.9	7.5	6.8	11.1	10.9	4.8	5.4	9.6	12.8	8.7
Current account (in % of GDP)	-5.3	-6.5	-5.9	-6.0	-4.5	-5.4	-7.1	-7.4	-7.0	-6.0	-5.9	-5.8	-6.1	-5.8	-6.0	-6.8	-6.1	-5.8	-5.6	-6.2	-5.8	-7.2	-6.8	-6.3	-5.9
	Flexible exchange rate																								
GDP growth	4.8	3.7	4.2	4.5	3.9	4.1	4.6	4.1	4.8	4.9	3.2	3.6	4.5	4.0	4.0	4.1	3.9	5.1	4.6	4.4	4.4	4.0	4.6	3.7	4.8
Real per-capita consumption growth	-0.3	1.1	1.3	1.4	0.4	0.8	0.8	0.3	2.5	2.9	-0.1	1.8	0.0	2.7	2.7	1.4	0.6	1.4	2.0	1.6	2.7	2.9	1.4	1.5	2.1
Real per-capita investment growth	-2.3	3.9	2.1	3.9	0.8	0.0	3.1	1.6	4.2	2.1	6.7	2.4	5.9	0.2	1.7	4.2	3.2	3.1	1.8	1.9	3.4	3.9	2.1	2.9	5.6
Real per-capita absorption growth	1.6	2.0	1.0	1.3	0.8	2.8	1.9	0.4	2.3	1.9	0.5	2.8	1.8	1.9	1.0	2.4	0.7	1.0	2.3	0.7	2.2	3.4	1.5	1.3	2.4
Reserves (in months of imports)	3.9	4.1	4.6	4.4	4.1	2.7	2.5	2.8	2.8	2.8	2.4	2.3	2.6	2.6	2.6	2.8	2.5	2.9	3.1	3.1	2.6	2.8	3.0	2.9	2.9
Reserves (percentage change)	34.6	10.7	11.4	17.1	12.7	26.5	12.8	16.3	11.7	7.6	13.1	9.6	13.5	9.5	4.0	18.1	3.2	10.2	11.7	17.1	9.1	12.1	12.7	12.8	12.7
Current account (in % of GDP)	-3.3	-3.4	-4.3	-4.9	-4.5	-5.1	-5.9	-5.5	-6.8	-5.6	-5.9	-6.1	-6.6	-5.6	-4.9	-6.0	-6.8	-5.8	-4.7	-5.4	-5.9	-7.0	-6.9	-6.7	-6.9
	Fixed exchange rate																								
GDP growth	2.9	2.6	2.7	3.2	3.5	3.3	2.9	2.1	2.8	3.0	3.2	2.6	3.0	3.4	2.9	3.9	3.4	3.7	3.1	3.2	3.2	3.4	2.7	3.0	3.6
Real per-capita consumption growth	-1.6	0.3	-0.2	-1.0	0.8	0.4	-0.1	0.2	0.0	-0.1	0.1	-1.8	0.6	1.3	0.6	0.2	0.3	0.3	1.1	-0.1	-0.6	1.0	-1.3	0.8	0.9
Real per-capita investment growth	-1.1	1.0	-2.8	-0.3	1.0	3.1	1.9	-0.9	2.8	-0.2	2.5	1.3	-0.7	0.8	-0.7	2.3	3.8	2.0	2.3	-2.1	1.9	0.2	3.1	2.5	3.3
Real per-capita absorption growth	-2.0	0.5	-0.9	-0.7	0.5	0.8	0.1	-0.6	0.9	-0.3	0.6	-1.2	0.6	0.7	0.3	0.8	1.5	0.6	1.2	-0.6	-0.1	0.9	-0.4	0.5	0.5
Reserves (in months of imports)	2.2	2.1	2.0	2.2	2.5	2.3	2.1	2.2	2.3	2.6	2.0	2.3	2.4	2.2	2.8	2.0	2.1	2.2	2.5	2.7	2.4	2.6	2.8	2.7	3.2
Reserves (percentage change)	5.0	2.5	1.7	6.3	3.9	5.5	5.6	4.2	8.6	7.3	2.2	7.0	3.4	3.6	10.0	9.0	7.8	6.3	13.5	7.2	1.6	1.7	8.1	11.4	5.9
Current account (in % of GDP)	-6.1	-7.7	-6.8	-6.3	-4.8	-6.0	-8.4	-8.4	-7.1	-6.3	-6.2	-6.5	-6.9	-6.6	-6.7	-7.7	-6.5	-7.5	-7.0	-7.2	-6.2	-7.7	-7.1	-6.1	-6.4
	Commodity exporters																								
GDP growth	3.3	2.1	1.5	1.5	1.8	3.5	3.7	3.0	3.5	2.6	2.8	1.2	3.0	3.4	3.3	3.9	4.3	4.3	3.8	4.1	3.1	3.4	2.5	3.5	2.9
Real per-capita consumption growth	-0.6	-1.8	-0.2	-1.9	-2.0	1.7	0.1	1.3	-0.4	-1.8	-0.8	-1.7	-0.6	-0.3	-0.2	2.1	3.3	2.1	1.7	0.5	-0.7	0.7	-1.3	1.5	1.2
Real per-capita investment growth	-2.4	-1.1	-7.6	-2.6	-2.8	4.0	-1.7	-6.2	4.0	0.9	-1.8	-2.8	-0.3	-0.4	-5.0	3.7	7.0	-3.2	-2.0	2.9	3.8	-1.7	1.1	0.6	6.2
Real per-capita absorption growth	-1.0	-1.8	-2.7	-3.0	-2.0	2.6	-0.4	-1.3	0.8	-2.7	-0.3	-1.7	-1.8	-0.3	-0.4	0.8	2.1	0.6	2.1	0.7	-0.2	-1.7	-2.0	0.2	1.6
Reserves (in months of imports)	2.2	2.4	2.1	2.5	2.3	2.6	2.4	2.9	2.6	2.6	2.1	2.2	2.8	2.5	2.7	2.6	2.5	2.8	2.9	3.1	2.1	2.4	2.1	2.8	2.8
Reserves (percentage change)	1.8	7.9	-9.9	3.8	-7.3	-1.9	-6.6	12.9	8.3	2.9	5.1	5.2	2.7	7.3	7.4	11.6	5.4	4.0	12.5	10.7	0.5	0.5	7.9	21.3	7.7
Current account (in % of GDP)	-11.1	-7.7	-8.1	-7.8	-5.9	-6.5	-7.6	-7.7	-7.9	-5.8	-6.3	-5.4	-3.9	-4.3	-5.6	-7.6	-7.3	-7.5	-7.4	-7.9	-6.7	-7.5	-6.0	-5.5	-5.9
	Oil exporters																								
GDP growth	5.6	3.1	2.4	3.1	3.8	2.1	3.7	3.9	4.0	6.0	2.8	4.5	2.4	2.7	4.6	2.6	2.9	5.0	3.4	2.9	4.3	5.7	1.6	2.9	5.4
Real per-capita consumption growth	-0.8	2.6	-1.0	1.4	-0.5	6.3	-0.5	2.1	2.0	3.5	-0.2	3.3	0.3	1.8	4.3	-3.9	6.8	-0.5	-5.4	-0.3	0.6	2.6	-0.7	-0.9	0.0
Real per-capita investment growth	1.6	1.3	-6.4	3.5	4.2	1.1	0.2	4.5	6.8	2.0	1.1	2.1	9.0	-2.8	1.4	1.4	2.9	1.1	0.3	-2.8	0.9	5.6	0.8	4.8	3.6
Real per-capita absorption growth	0.8	6.3	-1.6	1.0	0.6	6.0	0.7	3.6	2.5	-1.0	-0.4	1.4	1.6	0.7	-2.9	4.0	3.5	-0.4	-4.7	0.2	-0.3	3.1	1.3	0.7	0.6
Reserves (in months of imports)	2.6	1.3	1.0	1.3	1.9	2.0	1.6	1.1	1.5	1.3	1.5	1.3	1.8	1.8	2.5	1.1	1.4	1.7	1.6	2.6	2.1	2.2	2.0	1.7	2.3
Reserves (percentage change)	20.1	-4.4	-34.3	3.4	18.1	27.3	-12.7	-14.3	42.5	5.3	10.5	-6.5	13.1	15.9	26.3	10.5	25.5	7.4	6.8	10.7	-2.9	21.3	8.1	14.7	11.4
Current account (in % of GDP)	2.6	-2.9	-1.9	-3.8	-3.0	-1.7	-9.4	-15.9	-6.0	-4.6	-6.1	-8.7	-8.9	-8.3	-3.0	-5.1	-8.9	0.5	1.7	-0.4	-7.6	-8.5	-8.5	-7.0	-8.8

Source: April 2010 WEO, IMF.

Table A.6: Macroeconomic Impact of Shocks *(continued)*

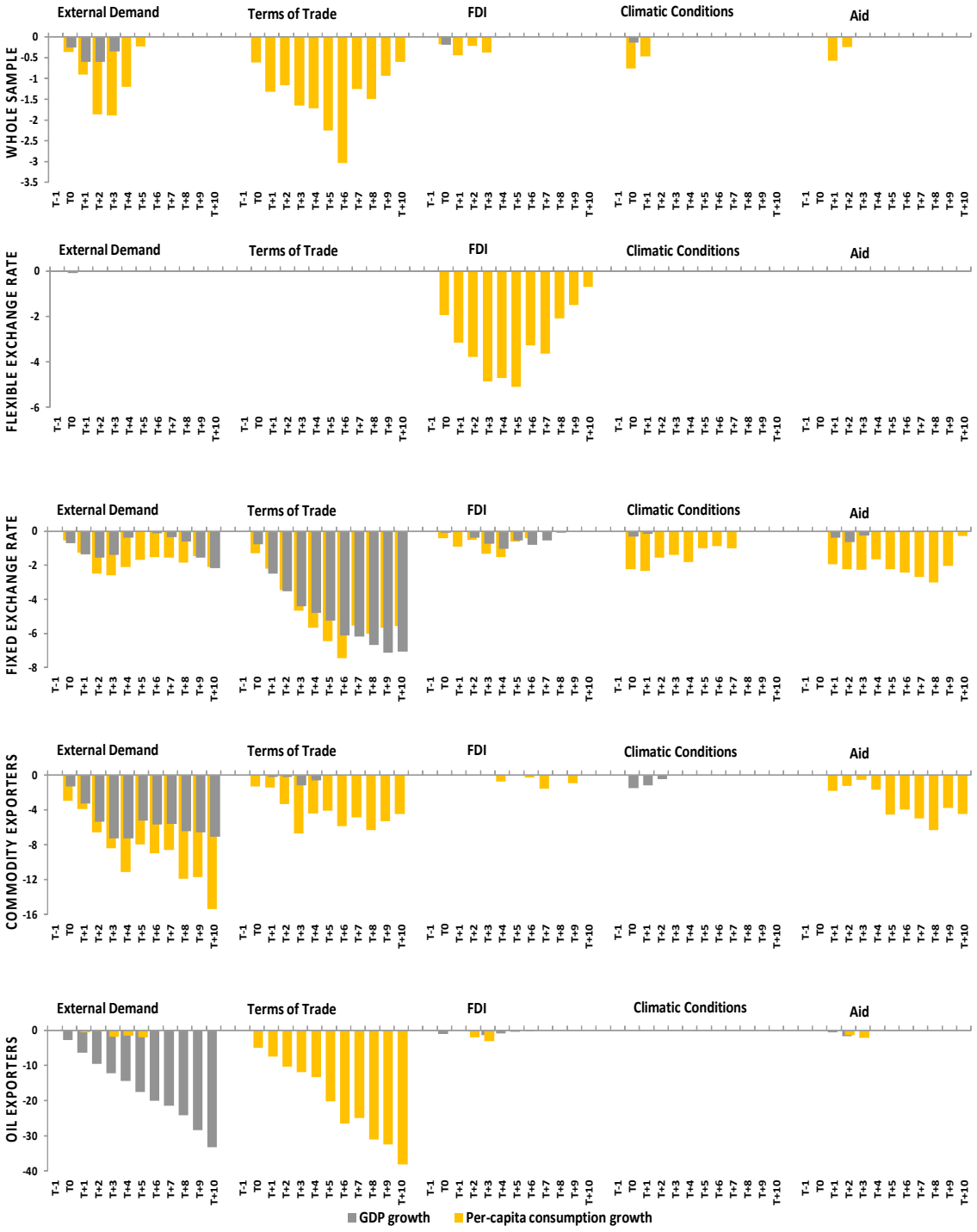
(annual percent changes unless otherwise indicated; median values)

	External Demand					Terms of Trade					Climatic Conditions					FDI					Aid				
	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3	T-1	T0	T+1	T+2	T+3
	Commodity importers																								
GDP growth	4.2	3.3	2.4	3.7	3.7	3.7	4.4	3.7	3.8	3.7	3.0	3.4	3.3	3.9	4.1	3.9	4.2	4.4	3.8	3.3	4.4	4.1	3.9	3.7	4.8
Real per-capita consumption growth	-0.3	0.6	-1.0	-0.3	1.9	4.1	1.2	0.5	0.4	-0.8	-0.3	-0.6	0.4	1.6	0.6	0.9	4.3	1.2	0.7	-0.3	-0.5	2.0	0.5	1.2	0.6
Real per-capita investment growth	-1.8	1.6	-4.4	0.0	0.7	1.1	1.8	0.5	1.3	2.0	0.3	1.1	2.2	0.3	1.3	1.4	3.3	2.4	-2.3	0.8	-0.3	4.5	-0.4	2.6	3.9
Real per-capita absorption growth	-0.5	0.9	-1.9	0.1	2.0	3.2	1.3	0.5	1.5	-0.5	-0.5	0.1	0.5	1.9	0.9	1.2	3.5	0.9	-0.4	0.2	-0.3	2.5	1.9	0.9	0.6
Reserves (in months of imports)	2.2	1.6	1.3	1.6	1.9	1.6	1.9	1.7	1.8	2.3	1.5	1.7	2.1	1.9	2.7	1.4	1.7	1.8	1.9	2.3	2.3	2.3	2.2	2.5	2.8
Reserves (percentage change)	13.4	-0.5	-13.7	10.9	12.9	10.9	8.5	4.2	15.8	9.2	6.1	12.2	14.5	6.8	7.6	12.8	7.1	6.2	8.4	8.3	7.2	8.3	11.0	14.7	7.6
Current account (in % of GDP)	-2.6	-4.6	-4.8	-5.0	-3.9	-3.7	-7.6	-6.4	-6.1	-6.1	-4.8	-4.3	-3.1	-4.3	-4.3	-5.0	-5.4	-3.5	-5.8	-4.6	-4.2	-4.2	-7.0	-4.0	-4.8
	Islands																								
GDP growth	1.7	2.5	2.5	3.5	3.0	3.1	2.9	2.7	2.8	2.8	3.5	2.7	3.2	2.3	2.6	3.0	2.1	3.7	2.3	3.0	2.6	2.7	3.1	2.5	2.7
Real per-capita consumption growth	-0.5	0.9	0.8	0.8	0.8	0.7	1.7	0.2	0.8	2.6	0.5	1.2	0.8	1.7	2.1	1.1	0.2	-0.1	1.4	1.8	-0.3	1.2	0.8	1.9	2.3
Real per-capita investment growth	0.9	0.0	-2.3	-1.1	-0.2	1.6	6.0	-1.9	4.6	-0.6	0.9	1.3	3.7	0.6	-0.7	3.2	2.3	3.2	1.0	0.2	2.8	0.0	2.3	3.2	4.6
Real per-capita absorption growth	-1.4	0.7	-0.1	0.7	0.5	2.9	2.5	-0.7	1.5	2.1	0.7	2.3	1.3	1.3	1.5	1.4	1.4	1.0	1.9	1.8	2.3	-0.4	0.3	2.5	2.1
Reserves (in months of imports)	2.6	2.4	3.0	2.6	3.1	2.6	2.5	2.7	2.5	2.9	2.1	2.3	2.6	2.7	2.9	2.0	2.0	2.1	2.4	2.4	2.5	2.6	2.9	2.7	3.0
Reserves (percentage change)	5.6	6.0	11.5	14.7	1.5	10.1	10.1	3.8	8.4	12.0	5.5	12.2	7.1	5.9	10.2	12.8	2.1	8.0	10.4	8.1	7.2	5.9	4.8	6.5	7.1
Current account (in % of GDP)	-5.3	-9.0	-8.5	-7.4	-4.6	-7.1	-10.5	-9.7	-7.5	-6.0	-7.2	-5.0	-7.6	-7.4	-8.1	-10.0	-11.0	-9.8	-8.8	-9.3	-7.7	-8.3	-5.7	-6.8	-8.3
	Highly indebted																								
GDP growth	3.9	5.2	4.6	3.5	4.7	2.9	5.5	3.7	3.3	4.8	3.9	3.9	4.1	7.6	6.1	4.6	4.6	5.4	5.5	5.0	4.0	5.1	4.8	4.5	4.4
Real per-capita consumption growth	-1.6	1.0	-0.2	2.3	0.8	-1.6	0.5	1.0	-1.7	0.8	0.7	-1.6	0.4	2.7	2.3	1.0	0.3	2.4	1.5	1.8	-0.8	3.2	0.0	1.2	0.9
Real per-capita investment growth	1.5	7.3	4.2	5.7	6.2	0.7	4.6	-2.4	-1.5	9.7	6.6	1.5	3.6	7.7	1.4	2.6	5.6	3.6	8.5	1.5	6.9	2.0	3.7	5.4	6.7
Real per-capita absorption growth	-1.7	2.2	0.6	0.7	2.1	-0.7	0.5	-0.6	-1.2	2.6	0.9	-0.1	0.9	2.9	2.0	1.3	0.8	2.2	2.5	2.8	1.3	2.0	2.2	2.4	0.3
Reserves (in months of imports)	4.0	4.4	4.6	4.4	4.5	3.0	2.9	3.6	4.5	4.6	4.6	4.7	4.9	4.8	4.8	4.5	4.5	4.8	5.8	5.6	4.6	3.9	3.8	4.6	4.4
Reserves (percentage change)	29.2	9.6	13.9	18.2	9.3	7.9	-4.6	18.6	26.9	14.3	6.1	7.9	5.9	5.1	14.1	9.3	10.7	5.6	9.9	13.7	3.7	-2.6	8.0	18.7	9.6
Current account (in % of GDP)	-3.2	-3.4	-5.3	-3.4	-1.9	-4.1	-5.1	-3.3	-3.6	-2.3	-4.5	-3.5	-3.3	-4.2	-5.1	-3.1	-2.9	-4.4	-3.6	-1.6	-2.1	-2.9	-3.5	-2.1	-3.0
	No IMF program																								
GDP growth	4.2	2.6	3.2	3.5	4.0	3.8	3.3	3.1	2.1	2.3	3.5	3.3	4.0	3.0	3.1	3.6	3.5	2.9	2.5	3.1	4.2	3.9	3.9	3.4	3.5
Real per-capita consumption growth	0.4	0.8	1.1	0.6	1.5	1.7	1.2	0.5	1.5	1.5	0.6	1.2	1.9	1.7	1.8	0.2	0.6	0.7	1.4	0.9	0.7	2.0	1.2	1.9	1.9
Real per-capita investment growth	1.2	0.7	0.1	-0.6	7.0	2.7	4.5	1.4	3.6	-2.8	2.4	1.9	4.4	0.3	1.2	3.7	4.4	2.5	2.2	1.9	4.6	1.2	3.0	3.3	2.5
Real per-capita absorption growth	-0.3	1.1	0.1	-0.5	1.3	2.9	1.3	1.0	2.4	0.7	1.2	2.3	2.6	2.2	1.5	1.4	1.5	0.6	1.6	1.2	3.1	1.2	2.2	2.5	0.8
Reserves (in months of imports)	2.4	1.9	2.1	2.4	2.3	2.3	2.4	2.4	2.4	2.5	2.2	2.7	2.9	2.7	2.9	1.9	1.8	1.7	1.6	2.1	2.6	2.5	2.6	2.5	2.9
Reserves (percentage change)	-3.2	3.1	-0.8	10.3	5.9	10.0	9.5	-3.6	6.9	12.5	7.4	11.1	5.8	3.3	15.0	13.9	3.9	1.2	8.5	10.3	4.3	9.1	3.9	7.1	7.5
Current account (in % of GDP)	-2.4	-4.6	-5.8	-5.7	-4.6	-5.4	-8.4	-8.0	-7.9	-7.4	-6.0	-4.8	-7.1	-7.4	-7.4	-5.6	-5.2	-7.1	-6.4	-6.1	-4.3	-7.3	-8.1	-7.2	-7.1
	Early IMF program																								
GDP growth	3.5	3.8	3.5	3.9	3.9	3.6	4.6	3.5	4.0	3.9	3.8	3.8	3.6	4.2	3.7	4.2	3.9	4.5	4.6	4.5	3.8	3.9	3.5	3.6	4.4
Real per-capita consumption growth	-1.2	0.8	-0.1	0.0	0.6	0.8	0.4	0.6	1.6	1.1	0.5	-0.5	0.4	1.2	1.2	1.9	1.2	1.5	1.7	1.0	0.3	1.5	-0.2	0.8	1.8
Real per-capita investment growth	-1.9	3.6	-2.6	3.8	-1.4	2.2	3.0	-1.9	3.7	3.4	4.7	4.2	-2.5	1.6	-2.0	4.3	4.8	3.0	6.7	1.5	2.9	0.8	3.2	3.9	4.8
Real per-capita absorption growth	-1.5	1.0	-0.8	0.6	-0.2	1.1	1.3	-0.4	1.5	1.1	1.1	0.5	1.0	0.8	-0.2	2.0	1.7	1.2	2.5	1.1	0.3	1.3	0.7	1.0	1.9
Reserves (in months of imports)	2.6	2.5	2.5	2.5	2.7	2.6	2.4	2.4	2.4	2.8	2.0	2.4	2.3	2.4	2.6	2.7	2.8	3.0	3.1	2.9	2.4	2.6	2.8	2.9	3.0
Reserves (percentage change)	16.8	5.2	5.4	8.4	8.3	10.2	5.7	12.6	11.9	8.7	10.2	9.6	3.8	10.8	6.3	14.1	7.9	9.0	13.5	10.5	7.4	3.8	11.5	15.6	9.6
Current account (in % of GDP)	-5.7	-7.0	-6.2	-6.3	-4.5	-5.7	-7.4	-7.4	-7.0	-6.0	-6.2	-6.7	-7.2	-6.5	-6.3	-6.4	-6.0	-5.0	-5.0	-6.1	-6.2	-7.3	-6.8	-5.9	-5.3

Source: April 2010 WEO, IMF.

Figure A.1: GDP and Consumption Costs by Type of Shock

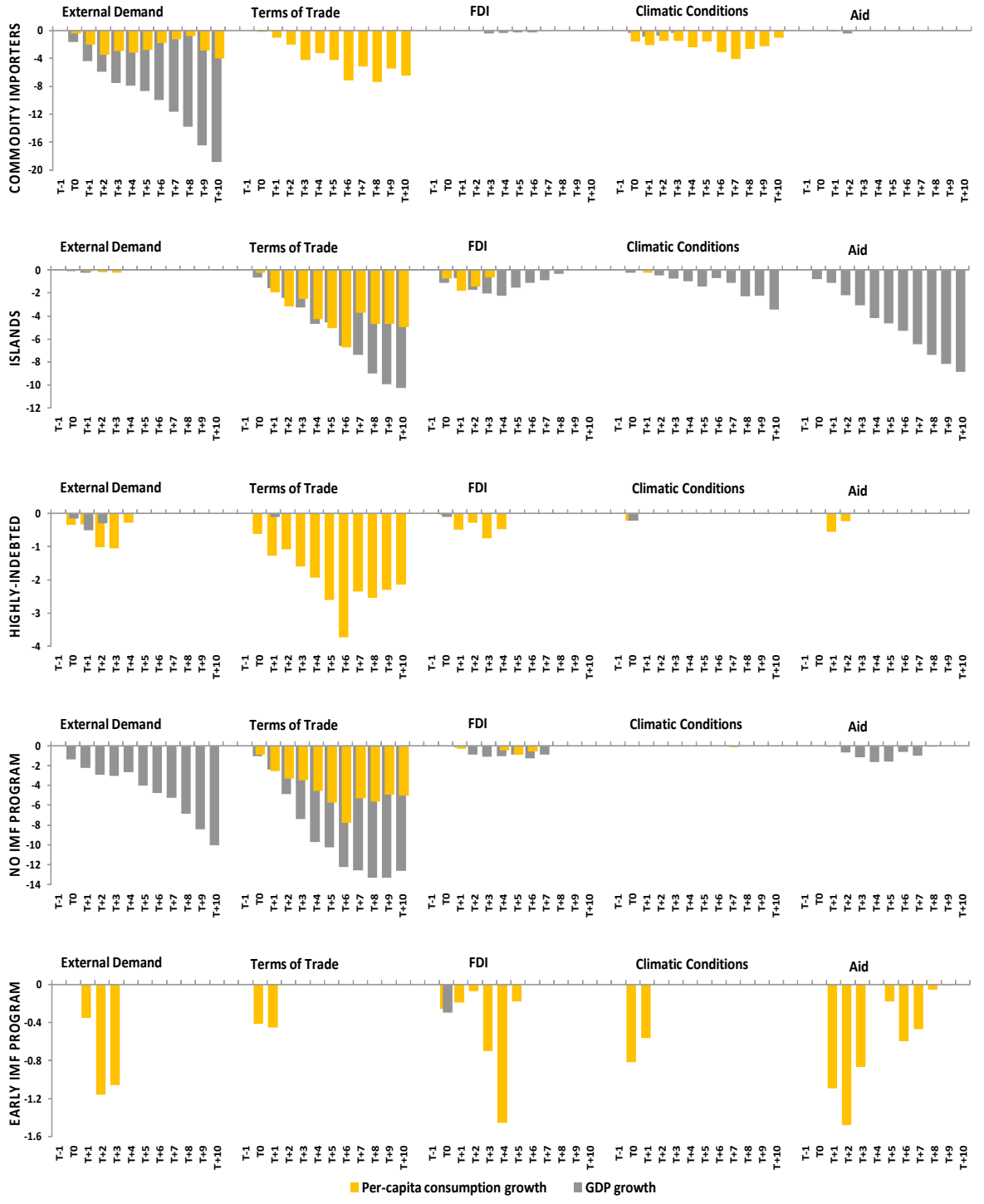
(losses computed with respect to pre-shock trend in percentage points; median values; duration up to 10 years)



Source: April 2010 WEO, IMF.

Figure A.2: GDP and Consumption Costs by Type of Shock *(continued)*

(losses computed with respect to pre-shock trend in percentage points; median values; duration up to 10 years)



Source: April 2010 WEO, IMF.

Figure A.3: GDP Costs by Type of Shock and Level of Reserves

(losses computed with respect to pre-shock trend in percentage points; median values; duration up to 10 years)

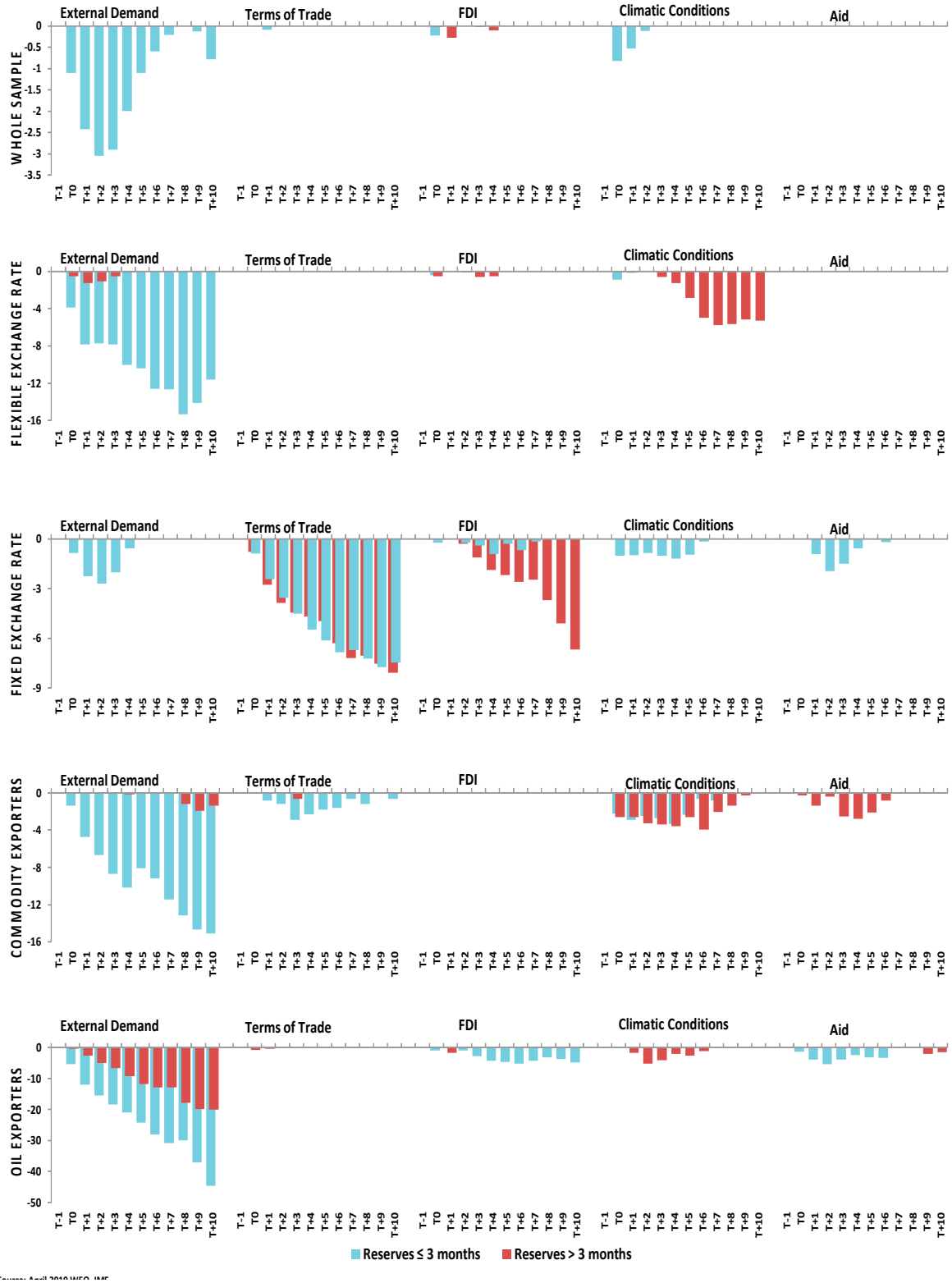
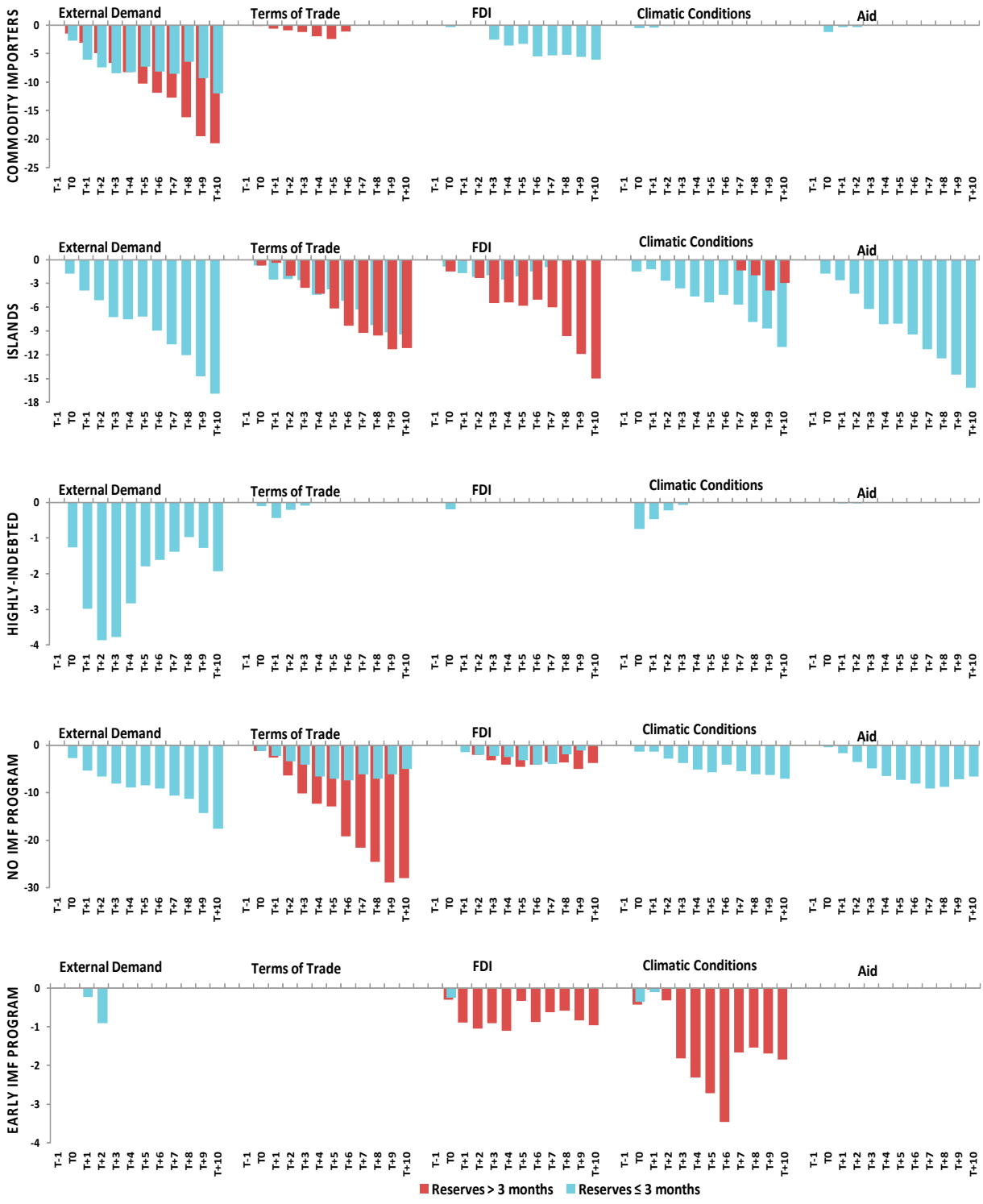


Figure A.4: GDP Costs by Type of Shock and Level of Reserves *(continued)*

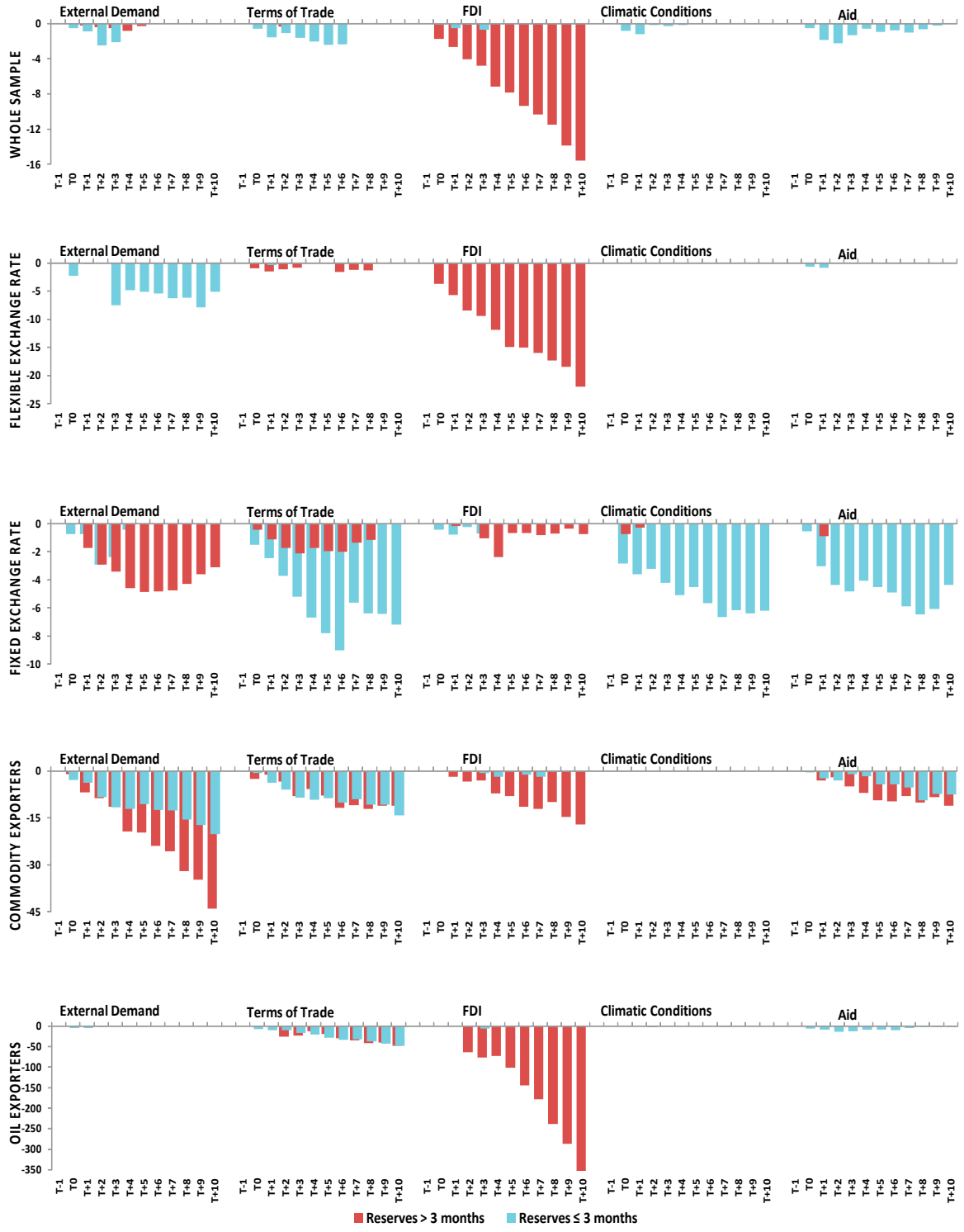
(losses computed with respect to pre-shock trend in percentage points; median values; duration up to 10 years)



Source: April 2010 WEO, IMF.

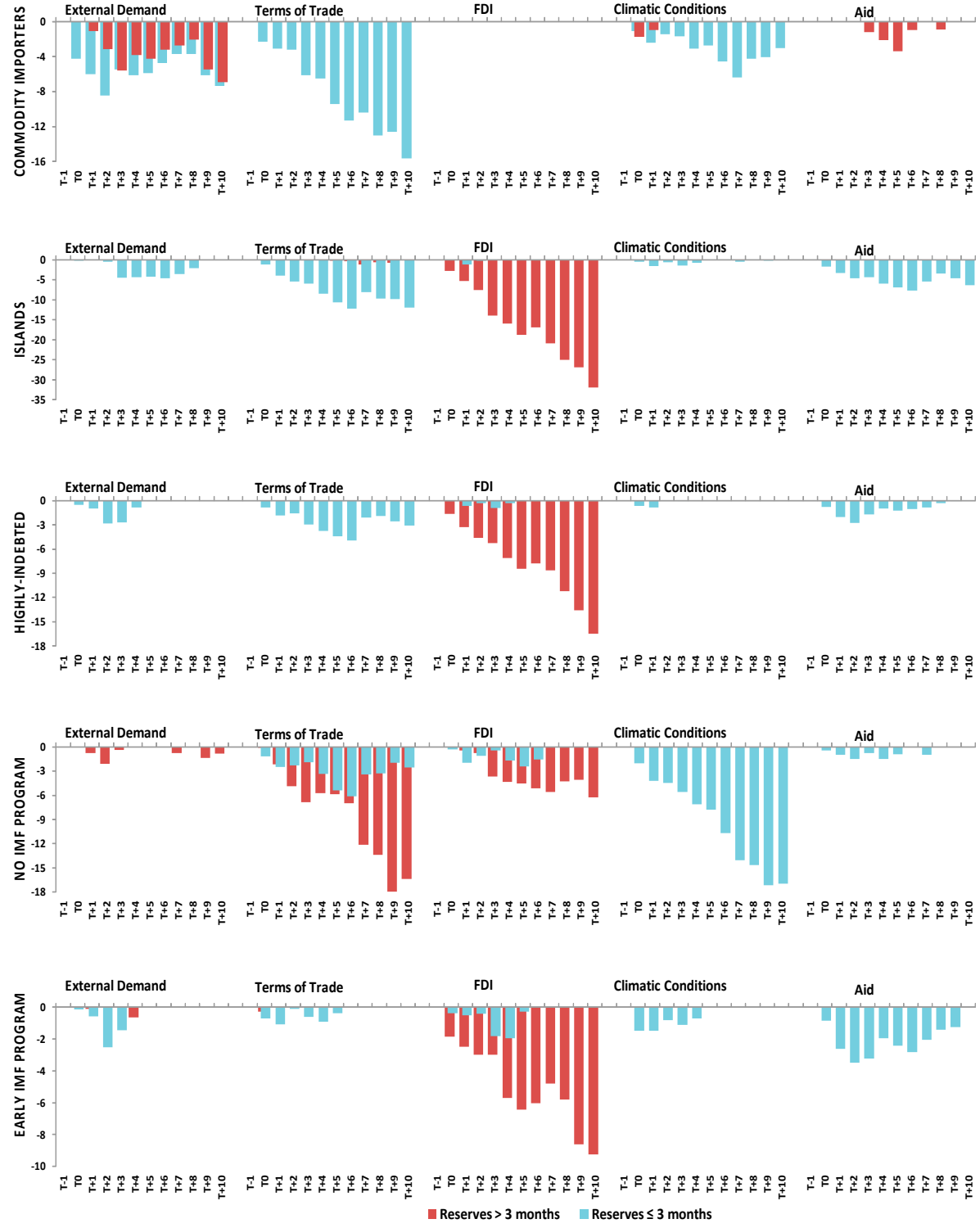
Figure A.5: Consumption Costs by Type of Shock and Level of Reserves

(losses computed with respect to pre-shock trend in percentage points; median values; duration up to 10 years)



Source: April 2010 WEO, IMF.

Figure A.6: Consumption Costs by Type of Shock and Level of Reserves *(continued)*
(losses computed with respect to pre-shock trend in percentage points; median values; duration up to 10 years)



Source: April 2010 WEO, IMF.

Table A.7: SDR Allocation

(in millions of SDRs)

	Member country	SDR allocation
	Afghanistan, Islamic State of	128.6
*	Armenia	88
	Bangladesh	463.3
	Benin	49.8
*	Bhutan	6
	Bolivia	137.4
	Burkina Faso	48.2
	Burundi	60.2
	Cambodia	68.5
	Cameroon	152.8
	Cape Verde	8.5
	Central African Republic	44
	Chad	44.2
	Comoros	7.8
	Congo, Dem. Republic of	424.5
	Congo, Republic of	70
	Cote d'Ivoire	273.1
	Djibouti	14
	Dominica	7.2
*	Eritrea	15.2
	Ethiopia	116.8
	Gambia, The	24.6
*	Georgia	144
	Ghana	290.9
	Grenada	10.2
	Guinea	84.9
	Guinea-Bissau	12.4
	Guyana	72.6
	Haiti	64.8
	Honduras	104.8
	Kenya	222.7
*	Kiribati	5.3
*	Kyrgyz	84.7
	Lao, People's Dem. Republic	41.3
	Lesotho	29.1
	Liberia	103
	Madagascar	97.8
	Malawi	55.4
	Maldives	7.4
	Mali	73.5
	Mauritania	51.9
*	Moldova	117.7
*	Mongolia	48.8
*	Mozambique	108.8
	Myanmar	202.3
	Nepal	60
	Nicaragua	105.1
	Niger	53.5
	Nigeria	1,518.20
	Papua New Guinea	116.2
	Rwanda	63.1
	Samoa	9.9
	Sao Tome and Principe	6.5
	Senegal	130.3
	Sierra Leone	82.1
	Solomon Islands	9.3
	St. Lucia	13.8
	St. Vincent and the Grenadines	7.6
	Sudan	141.9
*	Tajikistan	82.1
	Tanzania	159.1
*	Timor-Leste	7.7
	Togo	59.4
*	Tonga	6.6
	Uganda	143.7
*	Uzbekistan	262.8
*	Vanuatu	16.3
	Vietnam	267.1
	Yemen, Republic of	203.5
	Zambia	400.8
	Zimbabwe	328.4

Source: IMF, http://www.imf.org/external/np/tre/sdr/proposal/2009/0709.htm.

* Countries that will receive allocations for the first time as a result of both the General and Special SDR Allocation.

Table A.8: Macroeconomic Impact of the Crisis [1]

(annual percent changes unless otherwise indicated; median values)

	Pooled Data				Reserves ≤ 3 Months of Imports				Reserves > 3 Months of Imports			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
						Whole sample						
GDP growth	5.8	5.4	3.3	4.9	6.0	5.2	3.1	4.7	5.8	5.6	3.3	4.9
Real per-capita consumption growth	4.1	4.2	0.7	2.2	6.3	4.2	-0.9	1.9	3.9	4.2	0.7	2.3
Real per-capita investment growth	5.0	5.0	3.0	5.7	2.8	11.5	-6.1	3.5	5.7	5.0	3.7	6.7
Real per-capita absorption growth	4.2	4.9	0.2	3.5	2.9	4.4	-0.4	2.8	4.3	5.0	0.3	3.6
Reserves (in months of imports)	4.0	3.4	5.0	4.7	2.5	2.1	2.9	2.8	5.1	4.1	5.8	5.3
Reserves (percentage change)	28.2	4.0	22.0	5.9	18.0	9.9	33.8	16.5	30.1	3.2	20.5	4.9
Current account (in % of GDP)	-8.0	-11.1	-8.5	-8.0	-11.8	-16.6	-11.0	-9.2	-6.9	-9.6	-7.7	-7.9
						Commodity exporters						
GDP growth	6.0	5.4	3.3	5.6	5.6	4.8	3.3	6.4	6.6	5.9	3.3	5.5
Real per-capita consumption growth	4.2	5.8	1.1	1.7	6.5	4.2	2.4	1.5	3.3	6.4	-0.2	1.8
Real per-capita investment growth	3.7	3.5	1.4	6.2	-2.2	3.0	-0.2	6.7	4.8	3.6	2.9	5.7
Real per-capita absorption growth	2.8	5.5	0.7	4.3	-5.8	4.7	2.5	3.4	4.3	6.3	0.1	6.4
Reserves (in months of imports)	4.0	2.7	5.5	5.2	1.1	0.8	1.5	2.0	5.2	4.5	6.4	5.9
Reserves (percentage change)	22.2	0.5	40.4	10.4	11.3	0.5	57.3	19.6	30.8	0.1	31.9	8.1
Current account (in % of GDP)	-6.9	-11.9	-9.0	-9.7	-7.2	-13.1	-10.5	-6.8	-6.2	-11.7	-8.0	-10.9
						Oil exporters						
GDP growth	5.0	5.6	6.3	6.8	9.7	6.6	5.8	4.9	3.3	5.4	6.7	7.7
Real per-capita consumption growth	9.5	2.2	2.6	3.1	n.a.	n.a.	n.a.	n.a.	8.9	2.2	2.6	3.1
Real per-capita investment growth	2.8	-5.0	10.8	-3.3	n.a.	n.a.	n.a.	n.a.	1.0	-5.0	10.8	-3.3
Real per-capita absorption growth	7.7	0.9	3.1	5.3	n.a.	n.a.	n.a.	n.a.	7.1	0.9	3.1	5.3
Reserves (in months of imports)	5.7	6.0	5.8	6.6	1.5	1.3	1.2	0.9	5.8	8.3	8.3	6.8
Reserves (percentage change)	18.0	4.1	-16.3	-9.2	-18.6	1.5	-24.6	-14.1	19.3	5.0	-15.7	-4.3
Current account (in % of GDP)	-2.9	0.5	-9.6	-0.9	-12.5	-9.0	-12.4	-8.5	1.1	1.2	-8.9	2.7
						Commodity importers						
GDP growth	5.3	5.0	3.8	5.8	6.8	6.3	3.8	5.6	4.0	5.0	3.5	5.8
Real per-capita consumption growth	3.1	0.3	1.0	0.3	3.9	-1.2	2.6	0.1	3.1	0.6	-3.0	1.6
Real per-capita investment growth	3.8	1.3	-0.2	4.6	3.3	3.0	-6.1	4.6	5.1	1.3	8.8	5.7
Real per-capita absorption growth	5.9	1.5	0.3	2.2	0.5	4.1	0.8	1.7	6.5	1.5	0.0	3.6
Reserves (in months of imports)	5.7	4.2	5.6	6.0	1.1	1.1	1.5	2.0	7.1	6.3	7.8	7.3
Reserves (percentage change)	23.7	4.7	13.5	9.9	5.5	9.1	17.2	27.2	26.5	4.7	10.0	6.7
Current account (in % of GDP)	-6.6	-6.6	-9.0	-5.0	-10.5	-12.4	-11.4	-6.3	-2.6	-1.5	-8.9	-4.3
						Islands						
GDP growth	5.8	5.0	-0.3	1.8	6.1	0.8	-3.6	-2.0	5.8	5.6	1.8	2.2
Real per-capita consumption growth	4.4	4.7	-1.0	6.4	11.3	8.8	-2.6	10.5	3.8	2.6	0.7	2.2
Real per-capita investment growth	-0.5	9.3	-12.8	-5.4	-0.7	31.8	-38.5	-22.8	2.3	5.0	-11.2	7.4
Real per-capita absorption growth	3.7	5.3	-3.2	5.6	10.6	13.0	-7.6	4.8	3.0	4.4	-3.1	6.4
Reserves (in months of imports)	3.8	3.0	4.0	4.5	2.6	2.3	3.3	3.2	5.1	3.7	5.1	5.0
Reserves (percentage change)	19.6	-4.6	20.3	5.1	28.7	-3.9	14.5	29.4	16.6	-4.8	25.4	3.4
Current account (in % of GDP)	-14.7	-19.3	-15.3	-16.7	-29.3	-27.8	-20.7	-16.7	-13.8	-11.7	-11.1	-11.8
						Highly indebted						
GDP growth	5.8	4.9	3.1	4.7	6.0	4.8	2.8	4.6	5.8	5.4	3.1	4.8
Real per-capita consumption growth	4.5	4.2	-0.2	2.2	6.1	3.6	-1.7	1.7	4.4	4.3	-0.1	2.3
Real per-capita investment growth	5.1	5.0	1.6	5.6	2.8	7.9	-12.1	3.8	5.8	5.0	3.7	6.5
Real per-capita absorption growth	4.3	4.9	-0.1	3.5	1.9	4.1	-0.8	2.2	4.7	5.1	-0.1	3.7
Reserves (in months of imports)	3.7	3.1	4.9	4.6	2.5	2.3	3.0	3.0	5.1	3.7	5.3	5.0
Reserves (percentage change)	24.7	3.7	21.0	5.8	18.0	11.4	32.1	13.4	28.2	1.8	20.1	4.9
Current account (in % of GDP)	-8.4	-11.3	-9.0	-8.5	-12.5	-17.5	-11.2	-9.8	-7.0	-11.1	-8.4	-8.0
						No IMF program						
GDP Growth	6.3	5.0	3.4	4.1	4.6	0.1	2.3	2.9	6.6	6.0	4.2	4.6
Real Per-capita Consumption Growth	3.7	5.9	2.2	3.0	4.9	6.3	0.8	1.7	3.6	5.9	2.2	3.0
Real Per-capita Investment Growth	4.9	3.8	5.5	5.9	2.5	8.1	-3.1	0.3	7.7	3.8	5.5	5.9
Real Per-capita Absorption Growth	6.6	5.4	3.7	3.9	3.1	6.9	-0.4	4.1	5.3	5.4	3.7	3.9
Reserves (in months of imports)	4.2	3.7	5.0	4.5	2.0	1.8	1.9	1.9	5.3	4.3	6.5	5.2
Reserves (percentage change)	24.4	-1.1	23.0	5.1	11.7	-5.6	12.5	-7.9	37.0	4.2	26.2	9.4
Current Account (in % of GDP)	-8.6	-11.1	-8.2	-8.5	-21.9	-25.5	-19.4	-17.5	-3.2	-4.2	-4.3	-4.9
						Early IMF program						
GDP Growth	5.5	5.4	3.3	4.5	5.3	5.2	3.1	4.4	5.4	5.4	3.4	4.8
Real Per-capita Consumption Growth	4.2	4.1	-0.8	1.9	4.7	1.4	-2.7	1.5	4.1	4.2	0.0	2.2
Real Per-capita Investment Growth	4.0	5.1	3.1	5.7	4.3	17.6	-6.1	3.5	4.6	5.0	6.6	6.1
Real Per-capita Absorption Growth	3.3	4.6	0.0	3.4	1.8	3.9	-1.2	2.8	3.4	5.0	0.0	3.5
Reserves (in months of imports)	4.1	3.5	5.1	4.7	2.6	2.4	3.4	3.6	5.1	4.2	5.8	5.4
Reserves (percentage change)	24.5	6.0	20.3	4.1	27.6	15.7	34.9	10.9	24.5	3.2	19.2	1.9
Current Account (in % of GDP)	-8.1	-11.1	-8.9	-8.1	-11.9	-14.4	-10.0	-9.2	-6.9	-11.1	-8.5	-7.9

[1] Data limitations prevented the analysis for LICs with different exchange rate regimes.

Source: September 2011 WEO, IMF.