

Audiguier, Cindy

**Working Paper**

## The Impact of the Global Financial Crisis on the Least Developed Countries

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# The Impact of the Global Financial Crisis on the Least Developed Countries

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## Abstract

This paper investigates the short-run effects of the 2007–09 global financial crisis on GDP growth in least-developed countries (LDCs) compared to the effects on other low income countries and lower middle income countries. This paper shows that for many individual LDCs, 2009 was not extraordinarily bad. The output shock following the financial and economic crisis was less than expected and hit LDCs less than other developing countries. Moreover, the growth declines are on average well explained by the collapse in export demand. In two years, the volume of world trade fell by a third. Finally, there are few robust relationships between the annual cross-country growth variation between 2007 and 2009, and the variables reflecting policy and structural environment. The main exception is foreign aid that has mitigated the negative impact of external shocks on economic growth in LDCs. ... / ...

## Acknowledgments

The author warmly thanks Nicola Spatafora, Andrew G. Berg, Catherine Korachais and Patrick Guillaumont for insightful comments and suggestions. The author is also grateful to participants in the internal seminar at the IMF's Research Department held in July 2011. The usual disclaimer applies.



## Contents

I. Introduction .....	4
II. The boom-bust experience of LDCs since 2000.....	4
A. Key stylized facts.....	4
• A lower impact of the global financial crisis on LDCs as a group.....	4
• Higher synchronization between country groups.....	6
B. Drivers of the output decline.....	8
• The trade channel.....	8
• Decline in capital inflows.....	10
C. Responses of the LDCs.....	11
• LDCs pre-crisis situation .....	11
• Domestic policy response to the global crisis: countercyclical expenditure policy made possible by stronger buffers built in the 2000s.....	12
• External policy response to the crisis: the role of foreign aid and remittances during the crisis .....	13
III. The short run impact of the 2007-2009 crisis: Cross-Country analysis.....	15
A. Role of potential drivers.....	16
B. Role of initial economic conditions.....	16
C. Limits of the analysis.....	17
IV. The short run impact of the 2007-2009 crisis: Panel analysis between 1970 and 2009.....	19
A. Impact on growth decline.....	19
B. Channels.....	29
C. The role of policy.....	26
V. Case studies: How three LDCs limited the negative impact of the global crisis? .....	29
A. Mali: a maintained growth without an overall clear impact of the international environment .....	29
B. Uganda faced the crisis better than expected thanks to countercyclical expenditure.....	30
C. Zambia: a highly vulnerable country but a strong economic growth thanks to additional ODA .....	30
VI. Conclusion .....	32
VII. References.....	33
VIII. Annex.....	34

## Figures

Figure 1. Change in output growth rate (percentage points).....	5
Figure 2. Output growth rate (percentage points).....	5
Figure 3. Relative severity of 2009 output decline .....	6
Figure 4. Average Bilateral Correlations of Real GDP Per Capita Growth, 1965-2009 .....	7
Figure 5. Economic growth in LDCs.....	7
Figure 6. Channel in the growth rate of external demand.....	8

Figure 7. Channel in growth rate of terms of trade .....	9
Figure 8. Evolution of prices since the economic boom in 2000 .....	10
Figure 9. Change in FDI/GDP .....	10
Figure 10. LDCs fiscal response .....	12
Figure 11. Other LICs fiscal response .....	12
Figure 12. Reserves .....	13
Figure 13. Programmable aid .....	14
Figure 14. Remittances .....	15
Figure 16. Vulnerability to different shocks (data for 2007 and 2009) .....	31
Figure 17. Programmable aid in Zambia .....	31

## Tables

Table 1. Classification of LDCs according to their export specialization .....	9
Table 2. Policy buffer component .....	12
Table 3. Cross-Country Regression Analysis for Non-Fuel-Exporting LICs and MICs .....	18
Table 4. Regression Analysis: Specification for Output Growth, 1970-2009, Panel GMM .....	20
Table 5. Regression Analysis: Specification for Output Growth with asymmetries, 1970-2009, Panel GMM .....	21
Table 6. Regression Analysis: Output Growth with Asymmetries, 1970-2009, Panel GMM .....	22
Table 7. Regression Analysis: Fitting the 2009 Output Decline. ....	23
Table 8. Regression Analysis: Fitting the 2009 Output Decline .....	23
Table 9. Regression Analysis: Baseline Specification for Consumption / GDP, 1970-2009, Panel GMM .....	24
Table 10. Regression Analysis: Baseline Specification for Investment / GDP, 1970-2009, Panel GMM .....	25
Table 11. Regression Analysis: Baseline Specification for Government Expenditure / GDP, 1970-2009, Panel GMM .....	25
Table 12. Regression Analysis: Baseline Specification for Current Account / GDP, 1970-2009, Panel GMM .....	26
Table 13. Regression Analysis: Impact of different policy variables .....	28
Table 14. List of LDCs .....	34
Table 15. Cross-Country Quartiles Analysis for All Non-Fuel-Exporting LICs and MIC .....	35
Table 16. Cross-Country Quartiles Analysis for All Non-Fuel- LICs and MICs except for LDCs .....	36
Table 17. Cross-Country Quartiles Analysis for All Non-Fuel-Exporting LDCs .....	37

## I. Introduction

A common finding of recent research on the impact of the 2007-09 global financial crisis on low-income countries (LICs) is that their resilience has been higher than expected, with a rather rapid recovery (see for instance (IMF Regional Economic Outlook Sub-Saharan Africa, 2010).

The macro-economic consequences of the crisis on LICs has been highly documented (in particular by IMF (see for example IMF 2010a, Moghadam 2010)), but nearly none has specifically focused on the least-developed countries (LDCs). As particularly vulnerable low-income countries<sup>1</sup>, the LDCs may have suffered more, but as a target group for the international community they may also have been more helped to face the crisis.

LDCs saw their episode of highest growth since the 1960s during the boom period starting in 2000. LDCs' pre-crisis macroeconomic policy buffers were higher than in the past and may have played an important role in mitigating the impact of the crisis. After this episode of sustained and higher economic growth interrupted by the global crisis, challenges for LDCs are then to implement sound macroeconomic policies to retrieve their pre-crisis economic growth rate. The global financial crisis that started in 2007 raises three important questions for LDCs. First, what have been the short-run effects on growth in LDCs and what are the key transmission mechanisms? Second, are the effects different from those in other LICs? Third, how do the effects depend on policies and country characteristics?

This paper follows the 2010 IMF Working Paper from Berg, Papageorgiou, Pattillo et al. and focuses on LDCs in developing a comparative analysis of the impact of the financial and economic crisis on LDCs and other developing countries. The first part explicitly analyzes the determinants of the impact of the 2007-09 crisis on output growth in LDCs and other developing countries. Second, it evaluates the impact of both macroeconomic and structural policies. In addition, it also provides an analysis of the pre-crisis macroeconomic policy buffers built during the boom period. Third, the paper modelizes of the impact of external shocks by taking into account asymmetric and threshold effects. Finally, the paper includes three case studies (Mali, Uganda and Zambia) to broadly capture how countries were affected using the channels studied in the first section. It also discusses the policy space for responding to the impact of the financial turmoil for each case study.

## II. The boom-bust experience of LDCs since 2000

### A. Key stylized facts

#### A lower impact of the global financial crisis on LDCs as a group

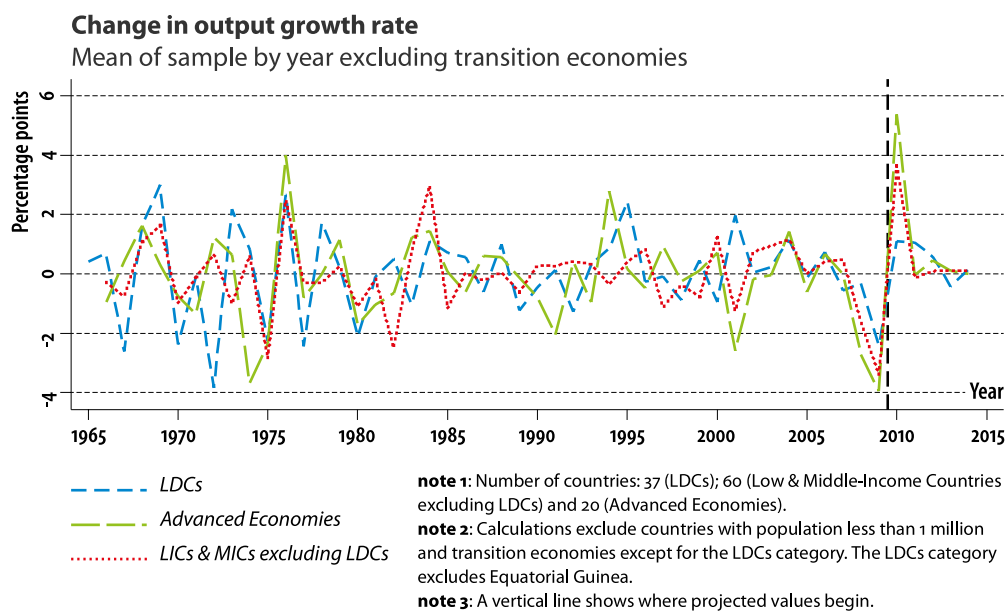
Output responses to the shocks have been quite heterogeneous across countries. Although the global crisis has substantially slowed growth in LDCs, other LICs and MICs were more severely hit. Indeed, 2009 represented the biggest shock to growth since the 1970s for LICs as a group but this

---

1. LDCs are defined as LICs facing structural handicaps to growth. The LDCs category accounts for 48 countries as of February 2011 and includes 33 countries in Africa, 14 in Asia and one in the Caribbean. Maldives was the last country to graduate in January 2011.

is not the case for LDCs (Figure 1). Among developing countries, MICs and oil economies were the most adversely affected. The crisis also caused a dramatic collapse in advanced economies, the most severe since the 1970s.

**Figure 1.** Change in output growth rate (percentage points)



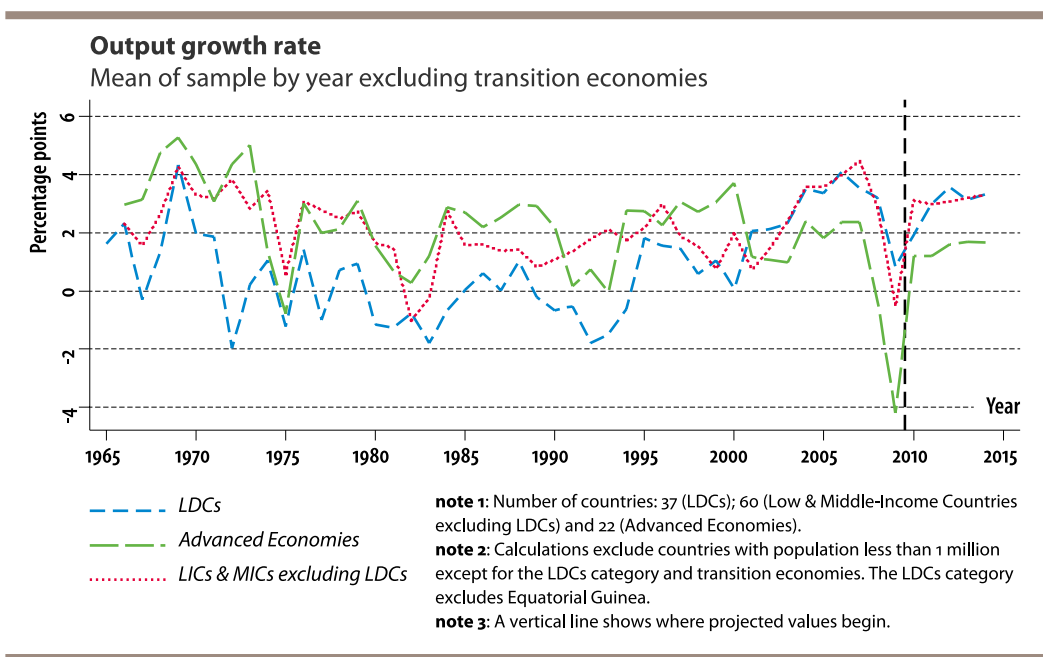
Note: Figure 1 is constructed as follows. For each group of countries, the annual change in output growth is computed.

In contrast to past crises and to other groups of countries in the world, growth remained positive for LDCs as a group and in two-thirds of individual LDCs (Figure 2); the median growth equals to 3.3% for LDCs and 1% for low and lower-middle income countries in 2009. Finally, even at the peak of the crisis, LDCs showed a higher resilience than expected and their average growth rate remained rather high by historical standard. However the dispersion of growth rates among low and lower-middle-income countries was higher than among advanced economies in 2009 but was expected to narrow in 2010 (IMF *Regional Economic Outlook Sub-Saharan Africa*, 2010).

For most individual LDCs economies, 2009 does not stand out as an extraordinarily bad year as pointed out before (Figure 3). Figure 3 is constructed by first computing, for each country, the change in output growth rates between 2007 and 2009<sup>2</sup>. This change is then compared with the entire distribution of annual changes in output growth rates for that country since 1970. As pointed by Berg et al. (2010), for most advanced economies, 2009 ranks among the worst 20 percent of all years in the period. In contrast, for two-thirds of the LDCs, 2009 does not rank among the worst years. This corroborates with the fact that the growth decline in LDCs was on average smaller than in other economies. It also reflects the generally volatile nature of the growth process in LDCs.

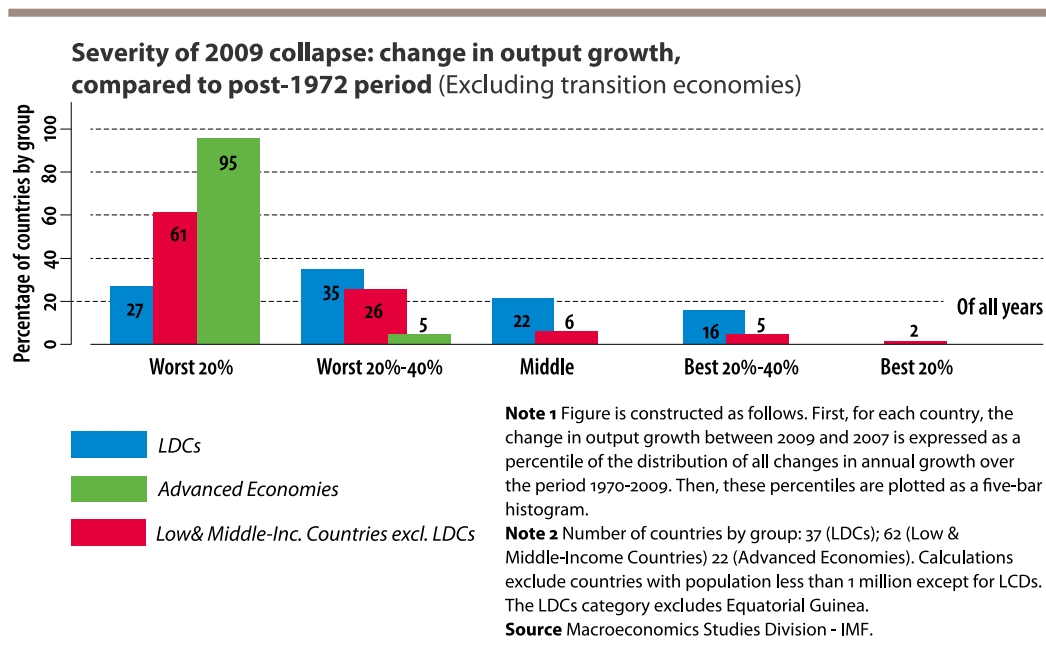
2. The year 2008 is ignored, since for many economies it represented a transitional period, with the crisis having started but its impact not yet fully felt.

**Figure 2.** Output growth rate (percentage points)<sup>3</sup>



Note: Figure 2 is constructed as follows. For each group of countries, the annual output growth is computed.

**Figure 3.** Relative severity of 2009 output decline



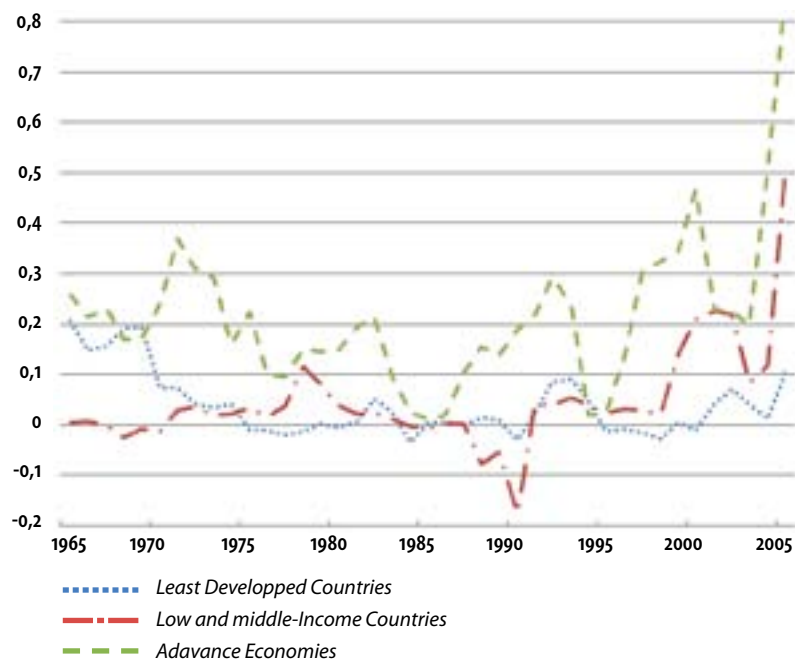
3. When upper-middle income countries are treated as a separate group from low and lower-middle income countries, they appear to have been more affected by the crisis in terms of change in output growth rate but LDCs still show unexpected growth resilience.



### Higher synchronization between country groups

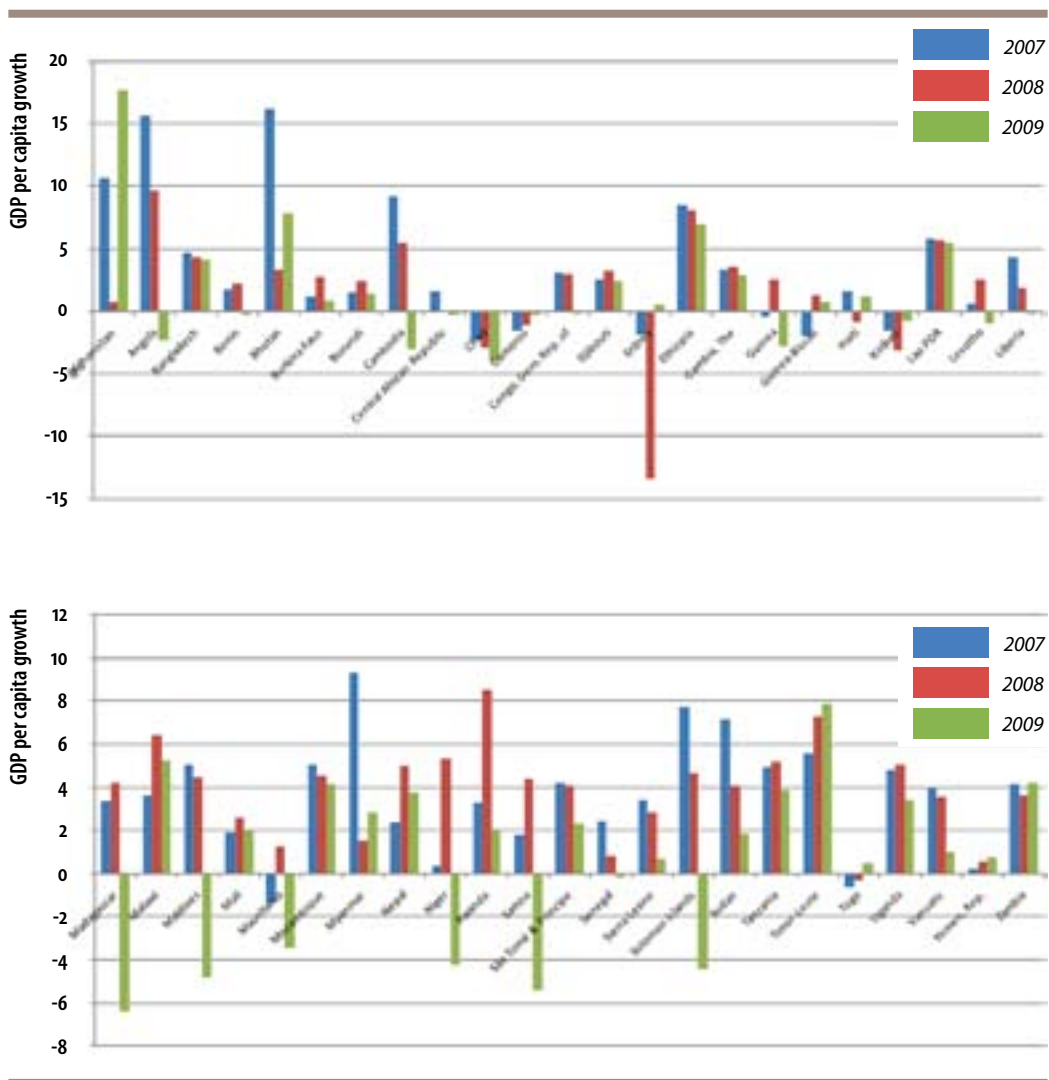
In contrast to past shocks having hit LDCs that were driven by idiosyncratic and domestic factors, in 2009 all the main country groups were much highly synchronized than in the past, reflecting the global nature of the crisis (Figure 4). The synchronization within country groups in 2009 was indeed highly unusual especially for advanced economies. The synchronization within the LDCs is lower than for the other countries and there was a large heterogeneity in the size of the individual countries growth shock in LDCs (see Figure 5).

**Figure 4.** Average Bilateral Correlations of Real GDP Per Capita Growth, 1965-2009



Note: Figure is constructed as follows. For each country, the bilateral correlations between its output growth rate and those of other countries in the same analytical group are computed, using a backward-looking 5-year time-window. Then, for each country, these bilateral correlations with all other countries in the same analytical group are averaged. Finally, these average correlations are averaged over all countries in a given analytical group.

**Figure 5.** Economic growth in LDCs



Note: No data available for Somalia // Source: WEO October 2010

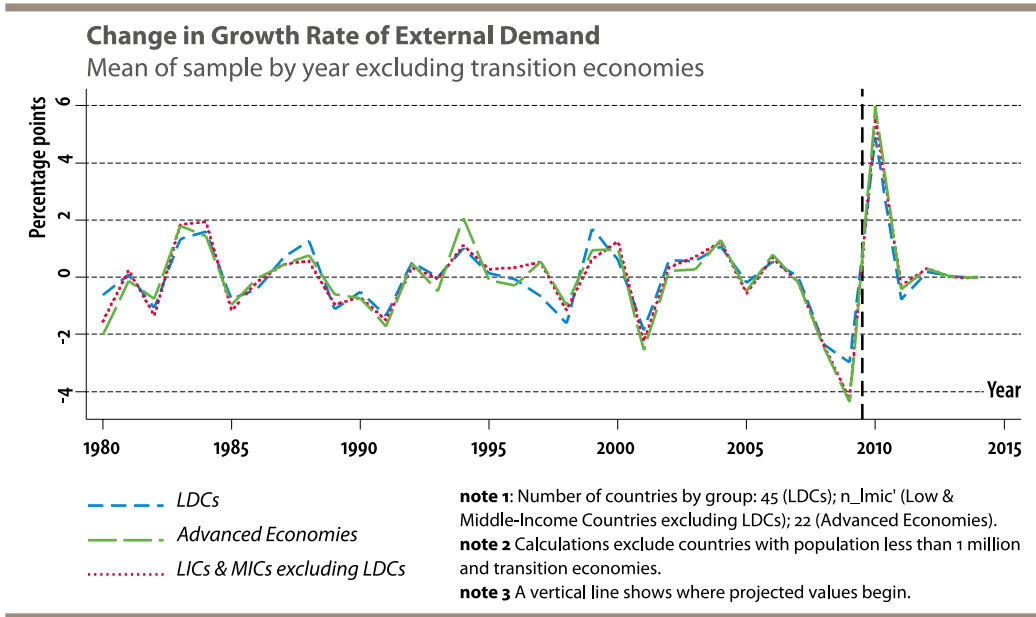
## B. Drivers of the output decline

### The trade channel

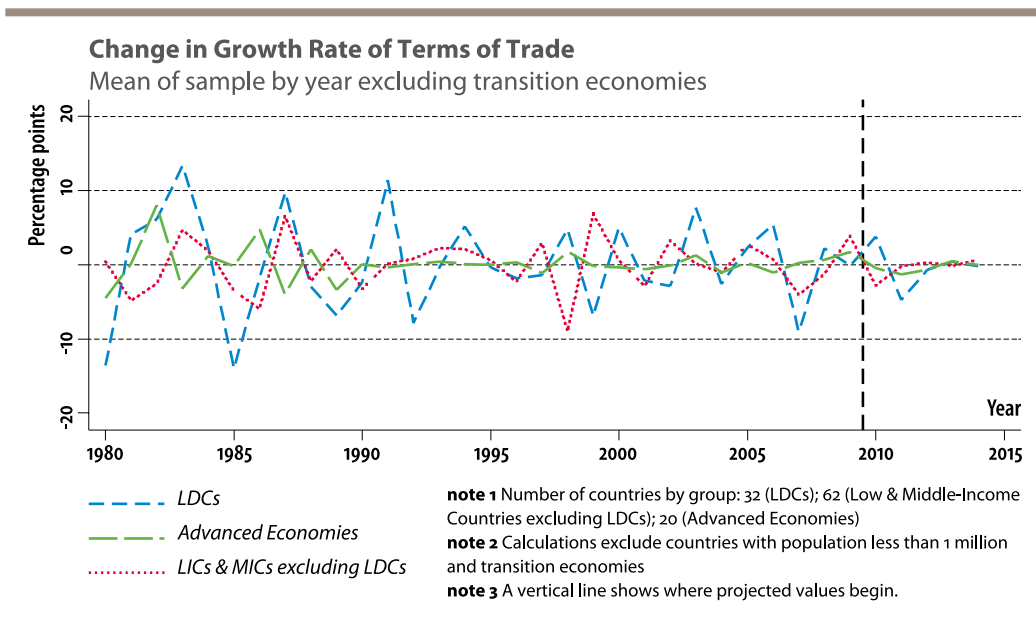
Unlike precedent crises, the transmission of the recent worldwide crisis mainly occurred through the trade channel in developing economies. A sharp fall in international trade affected all countries in the world in 2009 but LDCs to a less extent. LDCs that are less dependent on external markets saw a relatively smaller decline in their global external demand<sup>4</sup> (Figure 6). In contrast, when examining the changes in the external terms of trade, the period 2007–09 does not stand out as exceptionally negative (Figure 7). The highest decline for 2009 concerns the LDCs category but shocks of this size have been recurrent since the 1980’s.

4. External demand is defined as the export-weighted average GDP growth in a country’s trading partner.

**Figure 6.** Channel in the growth rate of external demand



**Figure 7.** Channel in growth rate of terms of trade



The impact of the crisis on developing countries varied depending on their export specialization. Most African LDCs are exporters of primary commodities (oil, mineral and agricultural products) whereas Asian LDCs are rather exporters of labor-intensive manufactured goods (Table 1). For most of LDCs with available data, the share of food and fuel imports in merchandize exports is more than 50 % which creates pressures on the current account balance for LDCs facing high oil and food prices during the 2002-8 boom period (Figure 8). To some extent the decline in food and fuel prices at international level light have alleviated the impact of the crisis by releasing their foreign export pressure. Service or manufactured goods exporters were negatively affected by the

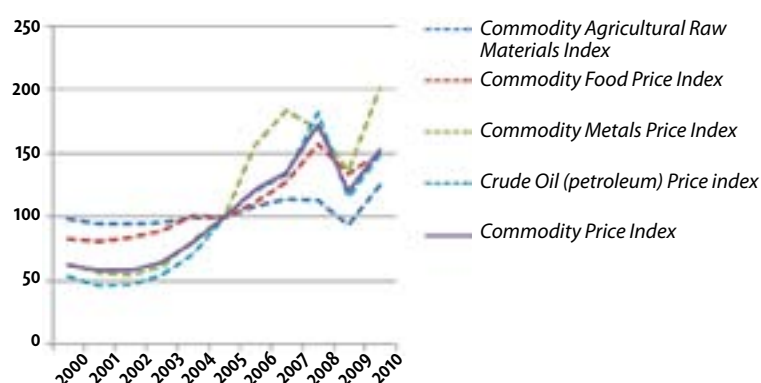
global downturn as the fall in demand for their exports led to a decline in their export revenues. 2008 marked the reversal of a period with high oil and mineral prices. The sharp fall of oil and mineral prices directly impacts the government budget of the oil and mineral exporting LDCs.

**Table 1.** Classification of LDCs according to their export specialization

Manufacturing Exporters	Oil Exporters	Mineral Exporters	Agricultural Exporters	Service Exporters	Diversified Exporters
<ul style="list-style-type: none"> <li>• Bangladesh</li> <li>• Bhutan</li> <li>• Cambodia</li> <li>• Haiti</li> <li>• Lesotho</li> <li>• Nepal</li> </ul>	<ul style="list-style-type: none"> <li>• Angola</li> <li>• Chad</li> <li>• Equatorial-Guinea</li> <li>• Sudan</li> <li>• Timor-Leste</li> <li>• Yemen</li> </ul>	<ul style="list-style-type: none"> <li>• Burundi</li> <li>• Central African Rep.</li> <li>• Congo Dem. Rep.</li> <li>• Guinea</li> <li>• Mali</li> <li>• Mauritania</li> <li>• Mozambique</li> <li>• Niger</li> <li>• Sierra Leone</li> <li>• Zambia</li> </ul>	<ul style="list-style-type: none"> <li>• Afghanistan</li> <li>• Benin</li> <li>• Burkina Faso</li> <li>• Guinea-Bissau</li> <li>• Kiribati</li> <li>• Liberia</li> <li>• Malawi</li> <li>• Solomon Islands</li> <li>• Somalia</li> <li>• Tuvalu</li> <li>• Uganda</li> </ul>	<ul style="list-style-type: none"> <li>• Cape Verde</li> <li>• Comoros</li> <li>• Djibouti</li> <li>• Eritrea</li> <li>• Ethiopia</li> <li>• Gambia</li> <li>• Maldives</li> <li>• Rwanda</li> <li>• Samoa</li> <li>• Sao Tome &amp; Principe</li> <li>• Tanzania</li> <li>• Vanuatu</li> </ul>	<ul style="list-style-type: none"> <li>• Lao PDR</li> <li>• Madagascar</li> <li>• Myanmar</li> <li>• Senegal</li> <li>• Togo</li> </ul>

Source: LDCs Report 2008; p xiii. UNCTAD. Geneva based on 2003-5 trade data

**Figure 8.** Evolution of prices since the economic boom in 2000

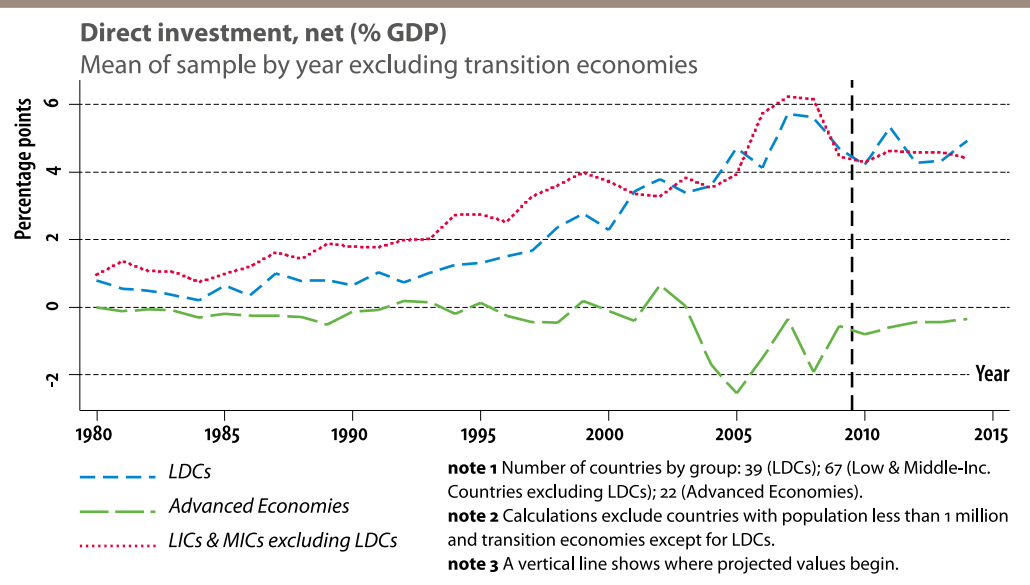


Source: Commodity price system

### Decline in capital inflows

Meanwhile, foreign direct investment (FDI) into LDCs and LICs & MICs declined in 2009 on average by amounts that were large by historical standards, but still fairly small relative to GDP (Figure 9). In LDCs, private investment rates remained at low levels but were resilient during the crisis. It is noteworthy that African fuel importers LDCs were successful in attracting more foreign investment during the boom period: FDI as a share of GDP went from 1.9 % in 2000 to 6.3 % in 2007 before going down to 4.9 in 2007.

**Figure 9.** Change in FDI/GDP



To summarize, the output shock following the financial and economic crisis was less than expected and hit LDCs less than other developing countries. This seems to be the result of a lower integration into the global economy than upper-middle income countries, advanced economies and fuel exporters, and then a lower sensibility to contractions of external demand and foreign investments. Before assessing the global shock impact on LDCs, a review of the pre-crisis LDCs position is conducted.

## C. Responses of the LDCs

### LDCs pre-crisis situation

LDCs group benefited from a high growth rate from 2000 to 2007 and thus entered the crisis with a stronger macroeconomic position than in the past (Table 2). From 2000 to 2007 LDCs as a group achieved some improvements: stronger international reserve coverage, a reduction in current account deficit, lower inflation and lower fiscal deficits and public debt. International reserves in particular increased since 1980 to reach record levels in 2007 in LDCs. However, despite stronger policy buffer than in the past, LDCs continue to lag behind average developing countries.

The situation differs across LDCs for which performance strongly depends on their export specialization. Commodity exporters made up of two thirds of African countries have benefited from the commodity boom since 2000. Thus, even if they still had a high level of inflation (the inflation rate is a little more than 7% for the sample of non-fuel LDCs countries just before the crisis), they were able to build stronger policy buffers with rising foreign exchange reserves and private investments and a declining government debt. Finally, in terms of fiscal and external position, African LDCs do not stand out as more vulnerable than their Asian counterparts.

**Table 2.** Policy buffer component

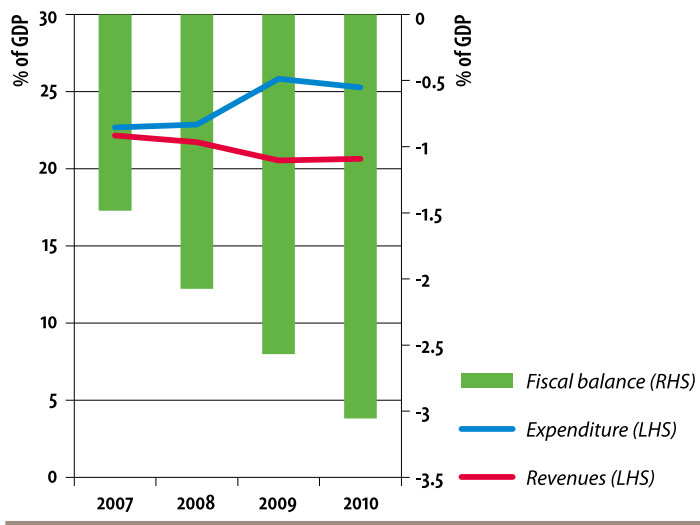
	Reserves (months of imports)					Current account (% of GDP)					Fiscal balance (% of GDP)				
	Obs.	2000		2007		Obs.	2000		2007		Obs.	2000		2007	
		Mean	Obs.	Mean	Change		Mean	Obs.	Mean	Change		Median	Obs.	Median	Change
Non-fuel LDCs	39	4.1	35	4.5	0.4	40	-6.2	40	-8.1	-1.9	40	-3.5	41	-1.1	-2.4
Non-fuel LICs& MICS	73	3.8	70	5.5	1.6	72	-4.8	74	-5.3	-0.5	66	-3.1	68	-2.0	-1.0
Commodities Non-fuel LDCs	12	3.5	11	4.1	0.7	12	-6.7	12	-8.0	-1.3	12	-4.4	12	0.3	-4.7
Non Commodities LDCs	27	4.4	24	4.7	0.3	28	-6.0	28	-8.1	-2.1	28	-3.3	29	-1.2	-2.1
Fuel LDCs	4	4.1	5	5.0	0.9	5	-7.5	5	38.2	45.6	5	-0.7	5	1.7	-2.4
Non-fuel African LDCs	27	4.0	25	4.5	0.5	27	-8.4	27	-8.2	0.1	27	-3.9	27	-0.5	-3.5
Non-fuel Asian LDCs	10	4.8	8.0	5.0	0.3	11	-1.5	11	-8.0	-6.5	11	-3.3	12	-1.2	-2.1
	Debt (% of GDP)					Inflation (%)									
	Obs.	2000		2007		Obs.	2000		2007						
		Median	Obs.	Median	Change		Mean	Obs.	Mean	Change					
Non-fuel LDCs	19	97.8	21	56.6	-41.2	31	18.2	35	7.6	-10.6					
Non-fuel LICs& MICS	37	48.8	40	47.2	-1.6	68	12.6	71	127.4	114.7					
Commodities Non-fuel LDCs	7	134.8	8	77.4	-57.4	10	37.7	11	8.9	-28.8					
Non Commodities LDCs	12	76.1	13	49.6	-26.5	21	8.9	24	7.0	-1.9					
Fuel LDCs	2	167.8	2	41.7	-126.1	4	61.7	5	8.3	-53.4					
Non-fuel African LDCs	16	101.8	18	61.4	-40.4	21	19.5	22	7.5	-12.0					
Non-fuel Asian LDCs	3	47.0	3	47.8	0.8	9	16.0	11	7.7	-8.2					

The 2000 and 2007 values for flow variables are calculated as the average over 1998-2000 and 2005-2007 respectively.

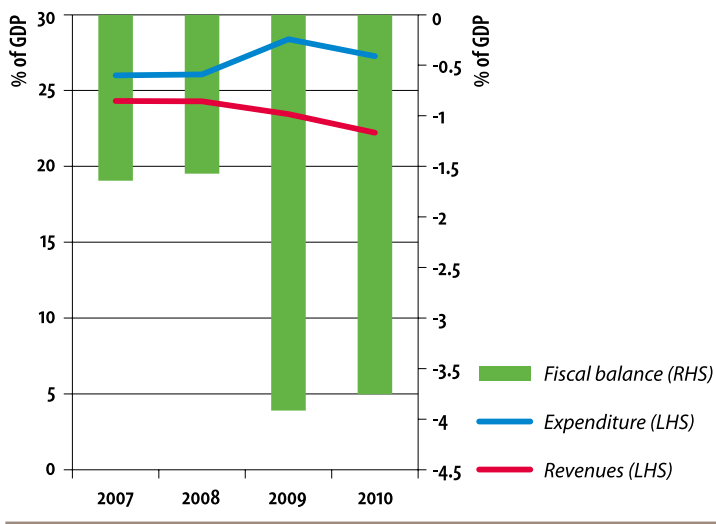
### **Domestic policy response to the global crisis: countercyclical expenditure policy made possible by stronger buffers built in the 2000s**

LICs and LDCs adopted a countercyclical fiscal response in response to the global shock. LICs and LDCs as a group did not curtail spending and thus increased expenditures. As a result, the median fiscal deficit widened in 2009 and 2010 (Figure 10 and Figure 11). This was possible due to higher coverage of international reserves and external financing. Reserves in LICs and LDCs followed an upward trend since the 80s until mid 2005. Unlike to other LICs, LDCs reserves stock started to decline in 2005 but the fall following the crisis was of a similar size than for the other countries (Figure 12).

**Figure 10. LDCs fiscal response**

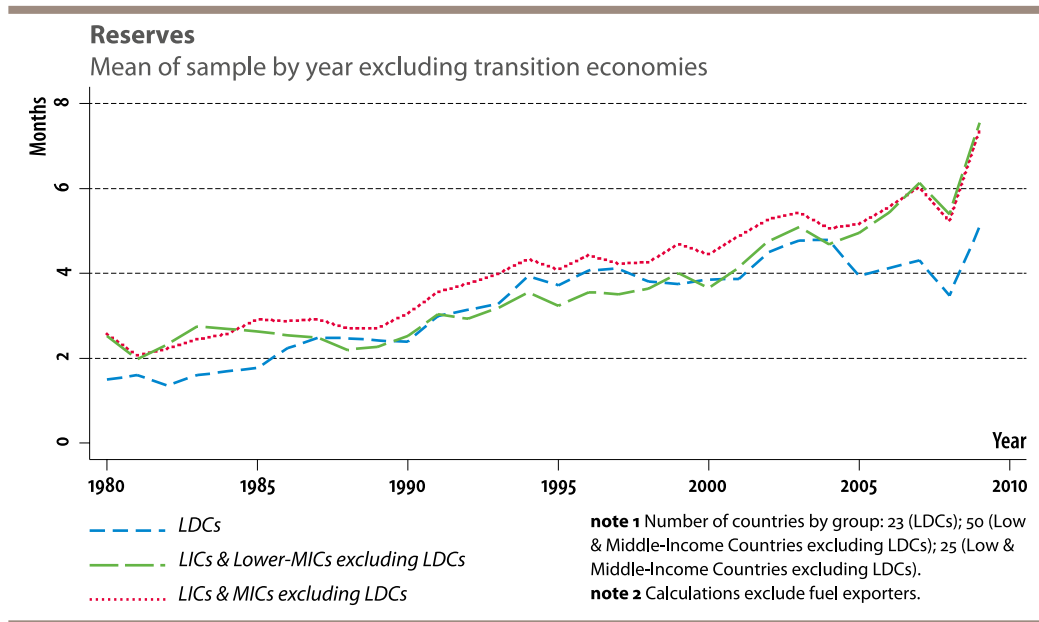


**Figure 11. Other LICs fiscal response**



Source: WDI 2010 ///Note: Calculations exclude fuel-exporters.

**Figure 12. Reserves**



### **External policy response to the crisis: the role of foreign aid and remittances during the crisis**

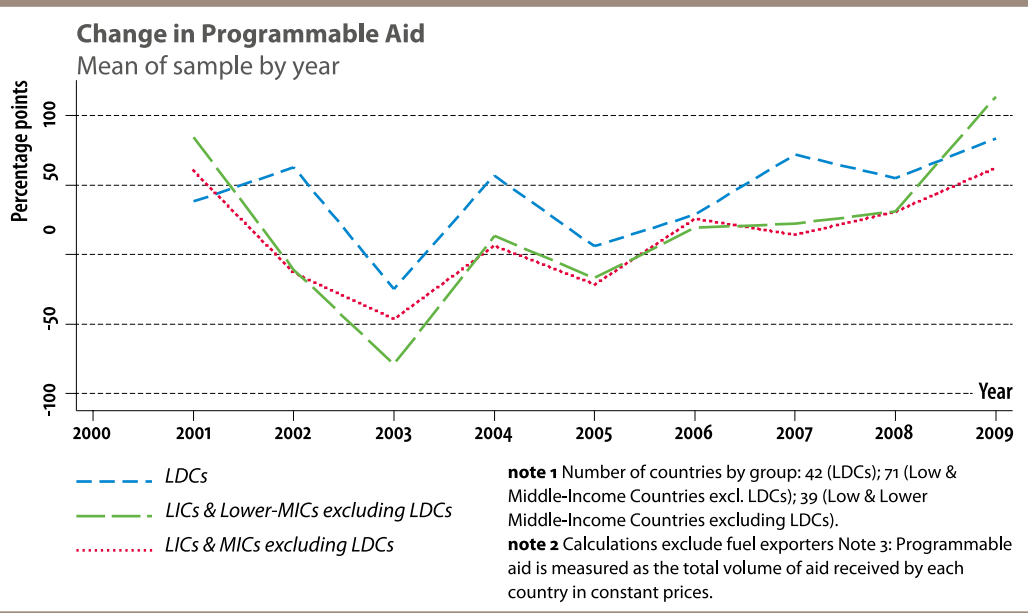
LDCs described as the most vulnerable developing countries are traditionally highly dependent on foreign aid. On average in 2007, aid disbursements represented more than 9% of GDP for non-fuel LDCs and went up to 12.7% for commodities LDCs. As a result, foreign aid might have helped to cushion the impact of the financial crisis. However, since the crisis affected most of donor countries, there was a risk of an aid budgets' decrease which would have dampen LDCs recovery. But programmable aid<sup>5</sup> has been on an upward trend since 2000 and did not fall during the crisis. Moreover, programmable aid<sup>6</sup> growth rate has been higher for LDCs since 2006 than other developing countries (see Figure 13). Nevertheless, aid targets are not expected to be respected since, due to the crisis and the pressure on their budgets, advanced economies only plan a marginal increase in their aid commitments in the coming years.

5. Programmable aid is a measure of aid computed by OECD-DAC that only includes "real" transfers of funds to recipient countries. It thus excludes flows to the recipient countries in the form of administration fund, student costs and refugees' costs as well as humanitarian aid and debt relief that are considered as unpredictable. This measure also does not net out loan repayments. Programmable aid is now available since 2000 and is roughly a little over a half of their gross bilateral official development aid.

6. The same trend as figure in figure 15 is obtained when using OECD-DAC total aid disbursements.



**Figure 13.** Programmable aid

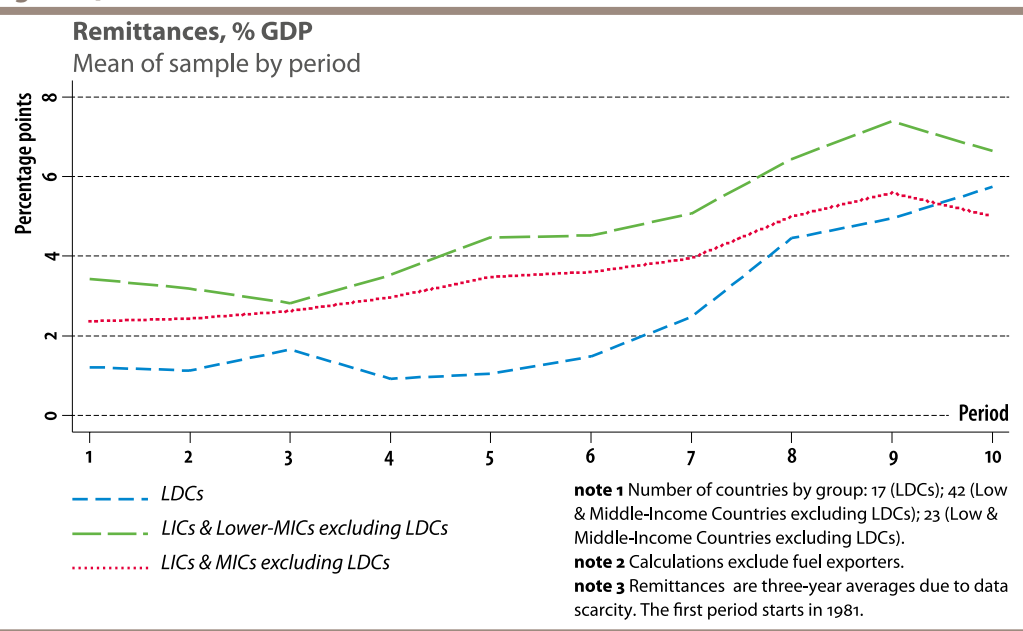


Source: OECD-DAC

Second, LDCs populations also rely on remittances. Remittances flows were historically low for LDCs in 2000, but increased more than threefold until 2008 (Figure 14). We notice some heterogeneity among least developed countries. Asian countries are bigger recipients than their African counterparts, and Bangladesh followed by Sudan and Nepal count for more than two thirds of total remittances to LDCs. Remittances accounted for more than 10 % of GDP for 5 least developed countries in 2008 (Samoa, Haiti, Nepal, Bangladesh and Senegal).

After years of rapid growth, remittances flowing to LDCs were less affected by the global crisis than had been feared. The role of remittances during the crisis has a double aspect. Remittances as a source of foreign capital can be seen as one of the driver of the crisis in developing countries through a pause in the growth of rate of remittances due to the crisis in advanced economies. On the other hand remittances by being a non-negligible source of income provision can also play the role of a compensatory finance. This second effect seems to have been higher in the LDCs during the crisis.

**Figure 14. Remittances**



### III. The short run impact of the 2007-2009 crisis: cross-country analysis

To explain the output decline specifically in LDCs and in all LICs and MICs in 2009, this section begins with a cross-country analysis, focusing on the period 2007-2009. As a first step<sup>7</sup>, the determinants of the cross-country variation in the change in the annual growth rate of real output per capita between 2007 and 2009 are investigated using OLS (Table 3)<sup>8</sup>. The basic estimated equation is of the following form:

$$(1) \quad (Dif1GGDP)_i = \alpha + \beta_1 (Dif1GTOT)_i + \beta_2 (Dif2GTOT)_i + \beta_3 (Dif1GED)_i + \beta_4 (Dif2GED)_i + \beta_5 (Dif1GFDI)_i + \beta_6 (Dif2GFDI)_i + \mu_i$$

with GGDP the growth of GDP, GTOT, the growth of terms of trade weighted by trade, GED growth of external demand weighted by the size of exports and GFDI growth of FDI.  $i$  is the country indicator and  $\mu_i$  is an error term. Dif1 is the difference between 2007 and 2009 whereas Dif2 expresses the difference between 2005 and 2007. All the right-hand side variables are expressed as a share of GDP.

The main independent variables are the three external shocks discussed in the previous section: the change in the external demand growth, the change in the external terms of trade growth

7. This methodology presents some limitations explained in Berg et al. 2010 due to little variation in the growth rate of external demand relative to the range of growth outcomes and to the fact that external demand may not play an important determinant of GDP growth in LICs and LDCs as they are mostly commodity-exporting price takers.

8. The time frame chosen in this paper is 2007-09 because 2007 was the last year in which growth was not affected in a major way by the global crisis.

weighted by the trade ratio, and the change in the ratio of FDI to GDP.<sup>9</sup> Following the discussion in the previous section, we expect that the major shock affecting non fuel exporting LICs as well as LDCs in 2009 were the decline in external demand, and to a less extent the decline in capital inflows.

The model also examines the role of policy space, the nature of output growth in the years preceding the crisis, and country structural characteristics. Owing to small sample size, these additional variables are included one at a time.<sup>10</sup> Hence, no single preferred and encompassing specification could be identified.

As a second step, to counteract the weaknesses of OLS and also to investigate potential nonlinearities in a flexible way, potential factors affecting the growth decline in LICs were explored further by dividing our country samples into quartiles based on the magnitude of the growth decline, and comparing the first with the fourth quartiles in terms of the same explanatory variables employed in the regressions (Table 15, Table 16 and Table 17 in the annex).

### **A. Role of potential drivers**

In both analyses (see table 1, tables 15-17), the decline in the growth of external demand is positively and significantly associated to the decline in domestic GDP growth for LICs and LDCs. In contrast, for the all countries sample, the regression analysis finds no evidence for a short term relationship between the domestic growth decline on the one hand and changes in terms-of-trade growth on the other hand.

The decline in FDI/GDP is also positively and significantly associated to the decline in GDP growth. Since LDCs receive on average a small amount of FDI relative to GDP (around 6% in 2007), a decrease in the FDI flows might play a marginal role on economic. Moreover, there was a smaller increase of FDI relative to GDP in LDCs than in the sample of all developing countries during the period 2007-9.

### **B. Role of initial economic conditions**

The analysis also shed light on the role played by initial characteristics in the short-run impact of the global downturn.

As suggested in the previous section the role of reserves as a policy buffer, i.e. in dampening the short-term impact of the crisis in LICs & MICs as well as in LDCs, is pointed out by the quartile analysis (presented in the annex). In particular, LDCs with small impact on growth (lower quartile) have on average a level of reserves covering 2.1 more months' imports compared to the upper quartile. The quartile cross-country analysis points out the buffer role played by the amount of international reserves. Since reserves reached a slightly higher level of reserves for LDCs than other countries in 2007, one can think that reserves help buffer more the short term negative impact on growth in LDCs.

9. To better capture the importance of external demand for each country, changes in external-demand growth are weighted by the share of exports in GDP. Intuitively, external demand should matter more in countries that depend more strongly on exports. Analogously, changes in terms-of-trade growth are weighted by the share of trade in GDP. A specification where external demand was weighted by the share of non-commodity exports in GDP was also investigated. Results were broadly similar.

10. Adding them all simultaneously resulted in very small samples and pronounced parameter instability.

The cross-country analysis indicates a negative association between the share of aid in GDP and the decline in domestic growth: countries with a higher share of aid experienced a smaller growth decline<sup>11</sup>. LDC economies that are heavily dependent on foreign aid (with an average of aid representing 9% of GDP in 2007) saw growth decline by less.

A deficit in the current account plays a negative role: countries with a deficit in the current account saw growth decline by more. Consequently in LDCs, weaker pre-crisis current account position intensifies the crisis impact on GDP growth.

The cross-country regression also shows a positive relationship between the growth of credit to the private sector during the recent years of strong growth (2000-2007) and the decline in domestic GDP growth. As LDCs are less dependent on credit to the private sector than other developing countries, the impact of credit growth on domestic GDP growth should be on average lower.

LDCs with a lower share of commodity and manufacture exports in GDP experienced a higher growth decline; this implies that service exporters' countries saw a higher decline in their GDP growth.

Concerning the relationship between openness and the growth decline, LDCs, less open economies than other LICs and MICs saw growth decline by less.

LDCs poorer countries in terms of initial per capita income saw a less important growth decline.

The quartile analysis corroborates with the cross-country findings on the role played by the initial per capita income, the share of commodity exports and the share of manufactures exports are associated with the growth decline. This can be explained by the general characteristics of LDCs generally being small and less opened countries: richer countries saw a more important growth decline whereas countries with a higher share of commodity exports experienced a smaller growth decline.

The analysis finds no evidence for a relationship between the domestic growth decline and remittances, the pre-crisis fiscal stance, government external debt<sup>12</sup> and the exchange rate regime<sup>13</sup>.

### **C. Limits of the analysis**

A caveat to these policy-related findings is that the analysis evaluates the effect on growth outcomes of the initial policy stance and of the scope for a policy response, that is, the effect of the policy space rather than of actual policies. This approach reduces the scope for endogeneity bias but it suffers from the limitation that different countries are likely to have used the available policy space to different degrees. In addition, small sample size and the influence of idiosyncratic growth determinants may have contributed to these non-results.

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11. The relationship between aid and growth is endogenous. The treatment of endogeneity is common in the literature on aid effectiveness but is not addressed here mainly because of the small size of the sample. This suggests that the estimated effects of aid on the dependent variable are underestimated.

12. Analyzing the impact of the initial fiscal deficits, or initial debt levels, relative to GDP is motivated by the notion that countries with stronger initial fiscal positions may be better placed to ride out the effects of negative shocks, for instance through greater scope for counter-cyclical expenditures.

13. The analysis adopts the Reinhart-Rogoff de facto classification, and splits countries into those with a "fixed" versus a "floating" exchange-rate regime.

**Table 3.** Cross-Country Regression Analysis for Non-Fuel-Exporting LICs and MICs

<b>Variables</b>	<b>Non-Fuel-Exporting LICs and MICs. Estimated Coefficients</b>	<b>Non-LDCs Non-Fuel-Exporting LICs and MICs. Estimated coefficient* change in the mean value</b>	<b>Non-Fuel-Exporting LDCs. Estimated coefficient* change in the mean value</b>
Dependent variable: growth in real per capita GDP in 2009 – growth in real per capita GDP in 2007			
<b>I. Main Explanatory Variables</b>			
2007-09 Change in terms-of-trade growth* trade/GDP	0.07		
2005-07 Change in terms-of-trade growth* trade/GDP	-0.06		
2007-09 Change in external demand growth* exports/GDP	<b>2.41***</b>	<b>0.72</b>	<b>0.72</b>
2005-07 Change in external demand growth* exports/GDP	<b>5.47***</b>	<b>-12.58</b>	<b>-8.75</b>
2007-09 Change in FDI as a share of GDP	<b>0.41***</b>	<b>0.74</b>	<b>0.62</b>
2005-07 Change in FDI as a share of GDP	<b>0.16*</b>	<b>-0.27</b>	<b>-0.22</b>
Constant	-0.47		
Observations	85	57	37
R squared	0.53		
<b>II. Additional Explanatory Variables</b>			
Fiscal policy:			
2007 Fiscal balance/GDP	0.00		
2007 Debt/GDP	0.00		
Exchange rate policy and level of reserves:			
2004 Exchange rate regime (higher=more flexible)	-0.11		
2007 Reserves/months of imports	-0.02		
2007 reserve/(short external liabilities plus current account deficit)	<b>1.45***</b>	<b>0.44</b>	<b>0.58</b>
External balance and capital inflows:			
2007 Current account/GDP	<b>0.16**</b>	<b>-0.78</b>	<b>-1.36</b>
2007 FDI/GDP	-0.15		
2007 Remittances/GDP	0.07		
2007 Aid/GDP	<b>0.15**</b>	<b>0.6</b>	<b>1.44</b>
Growth preceding crisis:			
Real per capita GDP growth in 2004-2007 relative to 1990-2007	-0.03		
Credit growth: Private sector during 2000-2007	<b>-0.12***</b>	<b>1.24</b>	<b>0.92</b>
<b>III. Structural characteristics</b>			
2007 GDP per capita (US\$)	<b>-0.001***</b>	<b>-2.81</b>	<b>-0.74</b>
2007 Share of commodities exports in GDP	<b>0.30**</b>	<b>1.20</b>	<b>0.72</b>
2007 Share of manufactures exports in GDP	<b>0.14**</b>	<b>1.89</b>	<b>0.46</b>
2007 Openness (trade/GDP)	<b>0.05**</b>	<b>4.40</b>	<b>4.13</b>

Notes: Cross-country OLS with heteroskedasticity-robust standard errors. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1, (\*) p<0.2. LDCs category excludes Equatorial Guinea.

We first run the regression of the cross-country variation in the change in the annual growth rate of real output per capita between 2007 and 2009 on the 3 potential sources of external shocks (the change in external demand, external terms of trade and FDI). In a second step we add one by one additional variables.

Column 2 computes the average impact by category of countries by multiplying the estimated coefficient by the change in the mean value for LICs and MICs excluding the LDCs. Column 3 reproduces the same result for the LDCs.

## IV. The short run impact of the 2007-2009 crisis: panel analysis between 1970 and 2009

### A. Impact on growth decline

By exploiting within-country variation, a panel approach can yield additional insights. In what follows, the output decline in LDCs and in LICs and MICs is analyzed through a reduced-form panel regression, based on annual data from 1970 onwards, with the growth of real output per capita as the dependent variable. The basic estimated equation is of the following form:

$$(2)$$
$$GDP\_pc\_gr_{it} = \alpha + \beta_1(\text{lagged } GDP\_pc\_gr)_{it} + \beta_2(TOT\_gr * \text{lagged } trade/GDP)_{it} + \beta_3(\text{lagged } TOT\_gr * \text{lagged } trade/GDP)_{it} + \beta_4(ED\_gr * \text{lagged } X/GDP)_{it} + \beta_5(\text{lagged } ED\_gr * \text{lagged } X/GDP)_{it} + \beta_6(FDI\_chg/GDP)_{it} + \beta_7(\text{lagged } FDI\_chg/GDP)_{it} + \delta X_{it} + \mu_i + \lambda_t + u_{it}$$

where  $i$  and  $t$  are country and time period indicators respectively. The key independent variables are, again, the three external shocks discussed above: the change in external demand, the change in the external terms of trade, and the change in the ratio of FDI to GDP. Both the simultaneous and the lagged values of these shocks are included. Given that LDCs are less open economies than other LICs and MICs, our baseline specification includes external demand and terms of trade weighted by respectively trade openness and exports as a share of GDP.

Other controls include the lagged output growth rate. The vector  $X$  captures other explanatory variables affecting GDP growth, discussed further below. The term  $\mu_i$  is a country-specific effect,  $\lambda_t$  is an unobserved time effect included to rule out results driven by common time-varying factors not otherwise included in our model and  $u_{it}$  is an unobserved random error term. The full sample covers 98 non-advanced economies, including both LICs and MICs of which 34 LDCs. The results shown below exclude the 15 fuel exporters (based on the IMF *World Economic Outlook* classification), in line with much of the literature, and reflecting the reality that such economies are likely to behave very differently.

This minimalist regression (as opposed to a full-blown growth regression with external shocks as additional variables) was adopted because it puts the emphasis in the right place for our purposes. The main shocks of interest, notably the terms-of-trade and partner-country demand, are plausibly exogenous to most LICs, which are almost always small in the markets for goods they trade. These shocks may be correlated with other variables that may matter for growth, for instance, the inflation rate or institutional quality. But, again, it is likely that the direction of causality runs from these shocks to the other variables, rather than the reverse. Thus, insofar as the shock variables act partly directly and partly through their influence on other variables, both effects are captured by the specification adopted.

Can such a minimalist formulation explain outcomes in 2009, particularly if 2009 is left out of the estimation sample? A critical requirement for this approach to make sense is that 2009 not be *sui generis*, that is, the events in 2009 not be qualitatively different from previous experience. Some encouragement may be taken, though, in that not only the output declines but also the external-demand shocks are not entirely unprecedented, as mentioned above.

The panel analysis yields several important conclusions.

First, external demand and terms of trade to a bigger extent for LDCs are highly significant determinants of output growth for LICs (Table 4). FDI is also another channel through which the global financial and economic crisis has affected LICs' output growth but this effect is expected to be lower in LDCs as FDI's directed to LDCs (in level) are very low.

Second, the data also show clear evidence of asymmetries, either measured by a below-mean shock<sup>14</sup> or a large negative shock<sup>15</sup> (Table 5 and Table 6). Below-mean shocks to external demand exert a disproportionately impact on output growth for LICs including LDCs. LICs and LDCs' output growth is also disproportionately affected by below-mean shocks to terms of trade.

Third, the (sample-specific) regression coefficients, estimated using the baseline specification and the period through 2007 alone, are combined with the observed 2007 growth, and with the (actual) changes in the independent variables over 2007–2009, to calculate the implied "out-of-sample" forecast mean change in output growth over 2007–2009. We find that the regression fits well the average LICs output decline in 2009. Most of this decline is explained by the collapse in external demand for all developing countries, including the LDCs. When allowing for asymmetries, i.e. when applying the estimated coefficients of model (2) given by Table 5, we find that the change in external demand accounts for almost all of the forecast change in growth (Table 8).

**Table 4.** Regression Analysis: Specification for Output Growth, 1970-2009, Panel GMM

<b>Variables</b>	<b>(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients</b>	<b>(2) Non-Fuel-Exporting LICs and MICs Mean value</b>	<b>(3) Non-Fuel-Exporting LDCs Mean value</b>
Lagged Growth	<b>0.150**</b> (0.059)	1.70	0.77
Growth in Terms of Trade * Lagged Trade Openness	<b>0.035**</b> (0.016)	-0.15	-0.50
Lagged Growth in Terms of Trade * Lagged Trade Openness	0.008 (0.013)		
Growth in External Demand * Lagged Exports/GDP	<b>1.796***</b> (0.322)	0.73	0.60
Lagged Growth in External Demand * Lagged Exports/GDP	-0.421 (0.309)		
Change in (FDI / GDP)	<b>0.153***</b> (0.045)	0.09	0.10
Lagged Change in (FDI / GDP)	<b>0.170***</b> (0.039)	0.14	0.15
Constant	<b>3.084**</b> (1.374)		
Observations	2.124		
Number of countries	83		

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses. \*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level. Regressions exclude fuel countries and countries with less than 1 million inhabitants except for the LDCs category.

14. Below mean shocks to external demand are defined as observations where partner-country demand growth lies below the mean.

15. Large negative shocks to external demand are defined as observations where partner-country demand growth lies more than two standard deviations below the mean.

**Table 5.** Regression Analysis: Specification for Output Growth with asymmetries, 1970-2009, Panel GMM

<b>Variables</b>	<b>(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients</b>	<b>(2) Non-Fuel-Exporting LICs and MICs Mean value</b>	<b>(3) Non-Fuel-Exporting LDCs Mean value</b>
Lagged Growth	<b>0.145**</b> (0.059)	1.70	0.77
Growth in Terms of Trade* Lagged Trade Openness	0.021 (0.020)	-0.15	-0.50
Lagged Growth in Terms of Trade* Lagged Trade Openness	0.014 (0.013)	-0.27	-0.60
Growth in External Demand* Lagged Exports/GDP	<b>1.683***</b> (0.329)	0.73	0.60
Lagged Growth in External Demand* Lagged Exports/GDP	-0.358 (0.309)		
Change in (FDI / GDP)	<b>0.182***</b> (0.047)	0.09	0.10
Lagged Change in (FDI / GDP)	<b>0.341***</b> (0.087)	0.14	0.15
Growth in Terms of Trade* Lagged Trade Openness* Indicator (Below Mean TOT Shock)	0.038 (0.035)		
Growth in External Demand* Lagged Exports/GDP* Indicator (Below Mean ED Shock)	<b>1.220***</b> (0.433)	0.23	0.27
Lagged Change in (FDI/GDP)* Indicator (Below Mean FDI Shock)	<b>-0.385**</b> (0.184)	-0.19	-0.15
Constant	<b>4.023***</b> (1.115)		
Observations	2,124		
Number of countries	83		

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses. \*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level. Regressions exclude fuel countries and countries with less than 1 million inhabitants except for the LDCs category.



**Table 6.** Regression Analysis: Output Growth with Asymmetries, 1970-2009, Panel GMM

	(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients	(2) Non-Fuel-Exporting LICs and MICs Mean value	(3) Non-Fuel-Exporting LDCs Mean value
Lagged Growth	<b>0.150**</b> (0.059)	1.70	0.77
Growth in Terms of Trade* Lagged Trade Openness	<b>0.025*</b> (0.014)	-0.15	-0.50
Lagged Growth in Terms of Trade* Lagged Trade Openness	0.009 (0.013)	-0.27	-0.60
Growth in External Demand* Lagged Exports/GDP	<b>1.690***</b> (0.313)	0.73	0.60
Lagged Growth in External Demand* Lagged Exports/GDP	-0.434 (0.310)		
Change in (FDI / GDP)	<b>0.164***</b> (0.046)	0.09	0.10
Lagged Change in (FDI / GDP)	<b>0.207***</b> (0.046)	0.14	0.15
Large Negative TOT Shock Indicator	<b>-1.668**</b> (0.831)	0.027	0.024
Large Negative ED Shock Indicator	-1.118 (0.883)	0.23	0.27
Large Negative Lagged FDI/GDP Shock Indicator	0.689 (0.568)	-0.19	-0.15
Constant	<b>3.090**</b> (1.331)		
Observations	2,124		
Number of Countries	83		

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses.

\*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level.

Regressions exclude fuel countries and countries with less than 1 million inhabitants except for the LDCs category.

Large negative shocks to external demand are defined as observations where partner country demand growth weighted by exports ratio is less than the country mean minus two times the country standard deviation of external demand growth.

**Table 7.** Regression Analysis: Fitting the 2009 Output Decline. “Out-of-Sample” 2009 Forecast, Based on Specification in Table 4, and Coefficients Estimated Through 2007

	All LICs & MICs
Actual Mean Growth Difference, 2009 vs. 2007	-5
Forecast Mean Growth Difference, 2009 vs. 2007	-3.3
Lagged Growth	-0.2
Terms of Trade	0.06
Lagged Terms of Trade	-0.07
External Demand	-3.3
Lagged External Demand	0.05
FDI / GDP	0.06
Lagged (FDI / GDP)	-0.01

**Table 8** Regression Analysis: Fitting the 2009 Output Decline. “Out-of-Sample” 2009 Forecast, Based on Specification with Asymmetries in Table 5 and Coefficients Estimated Through 2007

	All LICs & MICs
Actual Mean Growth Difference, 2009 vs. 2007	-5
Forecast Mean Growth Difference, 2009 vs. 2007	-3.5
Mean Contribution of Change In:	
• Lagged Growth	-0.2
• Terms of Trade	-0.01
• Lagged Terms of Trade	-0.03
• External Demand	-2.6
• Lagged External Demand	0.5
• FDI / GDP	0.04
• Lagged (FDI / GDP)	-0.08
• Terms of Trade * Indicator (Below Mean TOT Shock)	-0.2
• External Demand * Indicator (Below Mean ED Shock)	-0.9
• Lagged (FDI / GDP) * Indicator (Below Mean FDI Shock)	0.02

## B. Channels

What were the channels through which the shocks affected growth? To explore this, the previous regressions were re-estimated with alternative dependent variables, specifically, consumption, investment, government expenditure, and the current account, each expressed as a share of GDP. The results suggest that consumption responds to shocks to external demand (Table 9), and investment responds to shocks in capital inflows<sup>16</sup> (Table 10). Current account also responds

16. Results for LDCs are not available due to data limitations.

to terms of trade shocks, suggesting more scope for consumption smoothing in LICs and LDCs (see Table 11). Results for government expenditure are more mixed (see Table 12).

**Table 9.** Regression Analysis: Baseline Specification for Consumption / GDP, 1970-2009, Panel GMM

<b>Variables</b>	<b>(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients</b>	<b>(2) Non-Fuel-Exporting LICs and MICs Mean value</b>	<b>(3) Non-Fuel-Exporting LDCs Mean value</b>
Lagged (Consumption / GDP)	<b>0.711***</b> (0.038)	<b>93.7</b>	<b>102.0</b>
Growth in Terms of Trade* Lagged Trade Openness	-0.029 (0.029)		
Lagged Growth in Terms of Trade* Lagged Trade Openness	-0.019 (0.021)		
Growth in External Demand* Lagged Exports/GDP	-0.411 (0.317)		
Lagged Growth in External Demand* Lagged Exports/GDP	<b>0.894*</b> (0.515)	<b>0.77</b>	<b>0.61</b>
Change in (FDI / GDP)	-0.040 (0.106)		
Lagged Change in (FDI / GDP)	-0.021 (0.069)		
Constant	22.627*** (3.263)		
Observations	1,825		
Number of Countries	78		

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses \*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level. Regressions exclude fuel countries and countries with less than 1 million inhabitants except for the LDCs category.

**Table 10.** Regression Analysis: Baseline Specification for Investment / GDP, 1970-2009, Panel GMM

Variables	(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients	(2) Non-Fuel-Exporting LICs and MICs Mean value	(3) Non-Fuel-Exporting LDCs Mean value
Lagged (Investment / GDP)	<b>0.559***</b> (0.079)	<b>58.8</b>	<b>111.9</b>
Growth in Terms of Trade* Lagged Trade Openness	0.007 (0.020)		
Lagged Growth in Terms of Trade* Lagged Trade Openness	-0.001 (0.015)		
Growth in External Demand* Lagged Exports/GDP	0.473 (0.406)		
Lagged Growth in External Demand* Lagged Exports/GDP	0.341 (0.305)		
Change in (FDI / GDP)	<b>0.249***</b> (0.049)	<b>0.09</b>	<b>0.10</b>
Lagged Change in (FDI / GDP)	<b>0.273***</b> (0.049)	<b>0.14</b>	<b>0.15</b>
Constant	8.700*** (2.141)		
Observations	2,123		
Number of Countries	82		

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses \*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level. Regressions exclude fuel countries and countries with less than 1 million inhabitants except for the LDCs category.

**Table 11.** Regression Analysis: Baseline Specification for Current Account / GDP, 1970-2009, Panel GMM

Variables	(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients	(2) Non-Fuel-Exporting LICs and MICs Mean value	(3) Non-Fuel-Exporting LDCs Mean value
Lagged (Current Account / GDP)	<b>-0.541***</b> (-0.031)	<b>-.08</b>	<b>-.12</b>
Growth in Terms of Trade * Lagged Trade Openness	<b>0.128***</b> (-0.026)	<b>-0.15</b>	<b>-0.50</b>
Lagged Growth in Terms of Trade * Lagged Trade Openness	<b>0.030**</b> (-0.015)	<b>-0.27</b>	<b>-0.60</b>
Growth in External Demand * Lagged Exports/GDP	-0.006 (-0.381)		
Lagged Growth in External Demand * Lagged Exports/GDP	0.159 (-0.318)		
Change in (FDI / GDP)	<b>-0.314***</b> (-0.076)	<b>0.09</b>	<b>0.10</b>
Lagged Change in (FDI / GDP)	<b>-0.285***</b> (-0.059)	<b>0.14</b>	<b>0.15</b>
Constant	<b>-6.864***</b> (-1.82)		
Observations	2,161		
Number of countries	82		

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses \*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level. Regressions exclude fuel countries and countries with less than 1 million inhabitants except for the LDCs category.

**Table 12.** Regression Analysis: Baseline Specification for Government Expenditure / GDP, 1970-2009, Panel GMM

Variables	(1) Non-Fuel-Exporting LICs and MICs Estimated Coefficients	(2) Non-Fuel-Exporting LICs and MICs Mean value	(3) Non-Fuel-Exporting LDCs Mean value
Lagged (Government Expenditure/GDP)	<b>0.558***</b> (0.132)	<b>26.6</b>	<b>32.1</b>
Growth in Terms of Trade* Lagged Trade Openness	<b>-0.017*</b> (0.010)	<b>-0.15</b>	<b>-0.50</b>
Lagged Growth in Terms of Trade* Lagged Trade Openness	-0.021 (0.028)		
Growth in External Demand* Lagged Exports/GDP	0.127 (0.410)		
Lagged Growth in External Demand* Lagged Exports/GDP	-1.585 (1.211)		
Change in (FDI / GDP)	0.026 (0.045)		
Lagged Change in (FDI / GDP)	0.049 (0.037)		
Constant	<b>9.845***</b> (3.151)		
Observations	2,010	1,365	826
Number of Countries	77	51	34

### C. The role of policy

From a policy standpoint, it is clearly important to know what policy actions dampen or magnify the impact of external shocks. This section examines the issue further, with a focus on the exchange rate regime, the initial reserve levels, initial fiscal deficit relative to GDP and the level of aid received.

Specifically, the set of independent variables in the previous section is augmented by interacting the shocks to external demand, the terms of trade, and capital flows with the various policy-related variables, one at a time (the policy variables themselves are also included separately as controls). The estimated coefficients on the interaction terms are then analyzed to determine whether specific policies dampen or magnify the impact of external shocks.

Foreign aid is found to buffer the impact of large negative shocks to terms of trade and external demand in LDCs (Table 13). As seen before, the 2007-09 global crisis has been defined as an external demand shock and aid appeared to dampen the negative impact of this large external demand shock to growth. In the context of the global downturn, foreign aid allocated to LDCs increased and helped LDCs avoid growth collapse. This result is in line with the argument that aid dampens the effect of structural vulnerability. Indeed it was argued that aid is more effective in countries which are more vulnerable to external shocks. Aid can reduce their negative impact on economic growth through its stabilizing impact (Chauvet and Guillaumont 2001, 2004, 2009). More precisely, aid helps to dampen the negative impact of export volatility shocks. However, developing countries are facing other types of shocks (climatic instability, external demand shocks ...) to which aid can also respond.

Most other results (exchange rate regime ...) were inconclusive, with most interaction terms proving statistically and economically insignificant, or displaying counter-intuitive sign patterns. The panel analysis does not corroborate the role of the level of reserves revealed through the cross-country as it is found to exacerbate the impact of large negative shocks to terms of trade (Table 13). This evidence on the role of reserves might be explained by the reluctance to use foreign reserves when hit by a crisis. That said, for many policy variables, including in particular indicators of structural flexibility or institutional quality, it may be reasonable to expect any effect to be revealed only over the medium- to long-run. The issue is addressed further in Berg and others (2010), which indeed finds some evidence that appropriate policies can dampen the medium-run impact of external shocks. The impact of the crisis should also be analyzed through the medium and long-term effect of the crisis. If the shock had longer-run implications, it will be a much greater disaster for LDCs.

That said, two important caveats stand out. First, any effects of policy would be easier to detect if the policy environment were measured better, and in particular if the analysis controlled not just for initial policy conditions, but also for the policy response to the crisis. Second, this analysis, based on annual data and focusing on short-run responses to external shocks, is not well placed to investigate the medium- to long-run impact of the crisis on developing countries, and how this is affected by structural and institutional characteristics.

**Table 13.** Regression Analysis: Impact of different policy variables,  
Based on Specification with Asymmetries, 1970-2009, Panel GMM

Variables	(1) Lagged Central Government Fiscal Balance	(2) Aid/GDP	(3) Reserves	(4) Fixed exchange rate
Lagged Growth	0.119* (0.061)	0.109* (0.060)	0.167*** (0.050)	0.118* (0.061)
Growth in Terms of Trade* Lagged Trade Openness	0.025* (0.013)	0.020 (0.018)	0.033** (0.014)	0.028* (0.015)
Lagged Growth in Terms of Trade* Lagged Trade Openness	0.011 (0.014)	0.009 (0.013)	0.009 (0.014)	0.016 (0.014)
Growth in External Demand* Lagged Exports/GDP	1.761*** (0.376)	1.642*** (0.322)	1.737*** (0.316)	1.334*** (0.380)
Lagged Growth in External Demand* Lagged Exports/GDP	-0.569 (0.347)	-0.635** (0.281)	-0.426 (0.310)	0.016 (0.352)
Change in (FDI / GDP)	0.152*** (0.054)	0.113** (0.046)	0.160*** (0.046)	0.114** (0.054)
Lagged Change in (FDI / GDP)	0.183*** (0.055)	0.237*** (0.051)	0.197*** (0.048)	0.192*** (0.061)
Large Negative TOT Shock Indicator	0.328 (0.693)	0.063 (0.103)	0.368 (0.739)	0.892 (0.733)
Large Negative ED Shock Indicator	-1.517* (0.892)	0.002 (0.003)	-0.902 (0.885)	-2.722* (1.414)
Large Negative Lagged FDI/GDP Shock Indicator	-0.165 (0.647)	0.004 (0.016)	1.833*** (0.660)	0.654 (0.954)
Interest variable	-0.037 (0.036)	-0.025*** (0.007)	0.071 (0.071)	-0.308 (0.422)
Interest variable* Indicator (Large Negative TOT Shock)	0.373* (0.207)	4.540*** (1.196)	-0.089 (0.103)	-1.965** (0.858)
Interest variable* Indicator (Large Negative ED Shock)	-0.006 (0.094)	0.109* (0.060)	-0.086 (0.087)	1.441 (1.462)
Interest variable* Indicator (Large Negative FDI Shock)	-0.147 (0.125)	0.020 (0.018)	-0.259*** (0.077)	-0.837 (1.272)
Constant	3.275** (1.525)	0.009 (0.013)	4.570*** (1.189)	4.400*** (1.320)
Observations	1,955	1,953	2,083	1,783
Number of countries	77	78	83	82

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## **V. Case studies: How three LDCs limited the negative impact of the global crisis?**

This section presents three case studies, which highlight the roles of targeted policies to counter the effects of the 2007-2009 financial crisis in a variety of country circumstances. The case studies were selected to broadly capture how countries were affected using the channels studied in the first section. It also discusses the policy space for responding to the impact of the financial turmoil. This section examines how Mali, Uganda, and Zambia were affected by the global crisis. These three countries all experienced a limited negative impact of the global crisis. While Mali and Uganda registered a higher growth in 2008 compared to 2007 before dropping in 2009, Zambia's GDP growth rate declined in 2008 before increasing again in 2009. More precisely, Mali succeeded in stabilizing its real GDP growth despite the weakening of external demand and lower exports. Uganda's high dependence on remittances made it exposed to the global crisis. However due to policy space for responding to the impact of the financial turmoil, the economy was only marked by a relatively modest dip in growth. Zambia was highly vulnerable to the global crisis mainly because of a sharp decline in the price of copper, their primary export commodity, and a reduction in foreign direct investment. Nevertheless, the crisis did not materialize into a drop in GDP growth per capita, supported by an increase in foreign aid disbursements.

### **A. Mali: a maintained growth without an overall clear impact of the international environment**

Despite a difficult international environment in 2008, macroeconomic stability has been maintained in Mali. Mali's economy is a fairly diversified economy, agriculture accounts for approximately a quarter of GDP, while services, transports and communications account for roughly 20% each. Concerning the commodities sector, Mali markets concentrate on cotton and gold. Given that Mali is not particularly well integrated into international financial markets and not heavily dependent on remittances, the primary source of vulnerability that may impact Mali's economy is through trade as it is an exporter of commodities. Indeed commodities accounted for 42% of Mali total exports. Plummeting cotton prices may impact Mali's export revenues. The FDI inflow channel may also impact the GDP growth in Mali as Mali strongly relies on foreign direct investment. Indeed, lower commodity prices led to a temporary freeze or downsizing of investment projects.

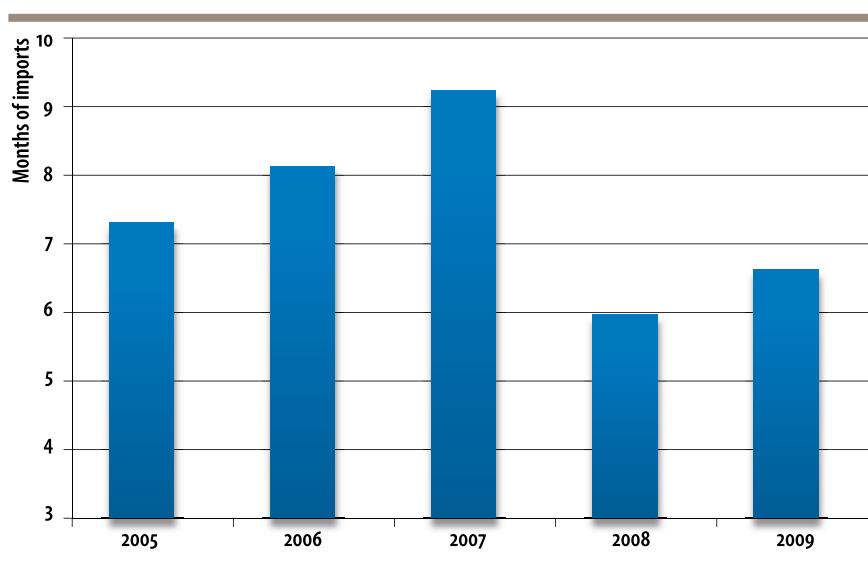
As a result of being a diversified economy, even though the global slowdown put some downward pressure on cotton prices, the other sectors of the economy were still growing thus off-setting the negative impacts of commodities decreasing prices. The secondary sector with many ongoing projects in the construction and energy sectors and the tertiary sector increased their contribution to the total value added. Real GDP growth per capita in 2009 was roughly at the same level as in 2007 (1.9 and 2.1% respectively). Consequently, Mali is one of the LDC economies where the global crisis did not materialize into a high slowdown of real GDP growth.



## B. Uganda faced the crisis better than expected thanks to countercyclical expenditure

Uganda economy is mainly based on agriculture that accounts for about 30% of GDP even if services all together represent 47% of GDP. The main channel through which the global financial and economic crisis has affected LDCs is through falling global demand and export revenues: Uganda was affected in 2008-2009 by a weak external demand for traditional exports, in particular coffee. Besides, worker's remittances, which have become an important source of external financing, (they account for 5% of GDP) may have contributed to the crisis with a decrease. Contrary to what was expected, Uganda remittances only experienced a slowdown in their growth during the crisis, so the economy was less affected than expected. Despite a slowdown, economic growth has remained strong by regional and international standards during the crisis. This may be due to the countercyclical policy led by the government and made possible by an increase of foreign reserves (see Figure 15). Indeed, Uganda accumulated foreign reserves since the 2000s and in 2007 they were at a high level representing more than 9 months of imports (3 months of imports is usually considered as the threshold). Thereafter reserves declined during the crisis to reach a level of 5 months of imports in 2009 but still remained at a very comfortable level. Uganda's government expenditure during the crisis aimed at overcoming infrastructure bottlenecks helped mitigating the impact of the crisis on domestic GDP. Sustained public investments in infrastructure and development projects including roads and energy have been driving the recovery.

**Figure 15.** Months of imports covered by reserves in Uganda



Source: WEO 2010

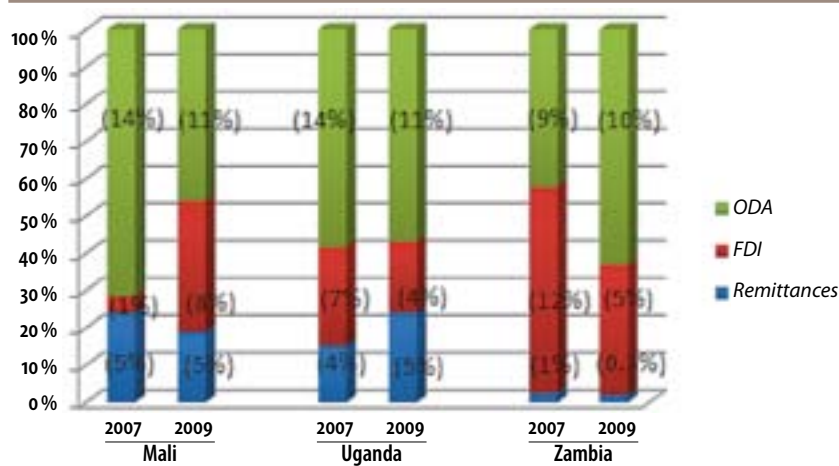
## C. Zambia: a highly vulnerable country but a strong economic growth thanks to additional ODA

Zambia is Africa's biggest copper producer and benefitted from high copper prices during the 2000s boom. Copper represents only 8% of GDP but 78% of Zambia total exports in 2008. Decline in external demand and fall in price export commodities are the main channels through which

the Zambian economy was affected by the financial and economic crisis. Concerning its external position, Zambia is not a big recipient of remittances, so might not be affected through a decline in remittances (see Figure 16). However Zambia is an important recipient of FDI and ODA, so is vulnerable to FDI and ODA declines. Remittances accounted for a slight share of the remittances, ODA and FDI cumulated (2%) whereas ODA and FDI respectively represented 42 and 55 % in 2007.

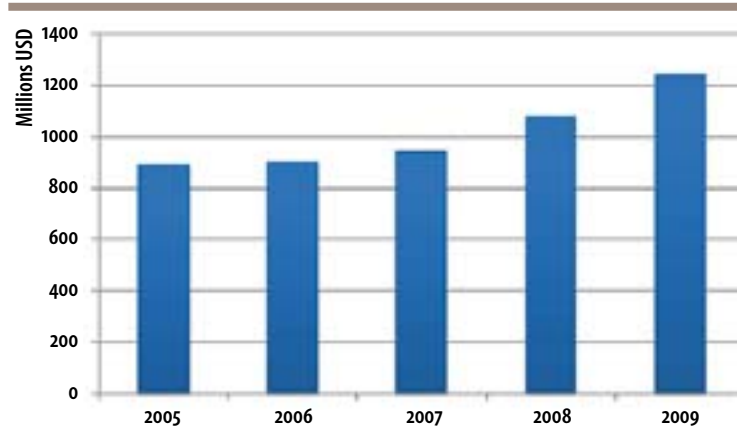
However, the crisis did not materialize into a drop in GDP growth per capita between 2007 and 2009: Zambian GDP growth reached 4.1 % in 2007 and went down to 3.6% in 2008 before reaching again the 2007 level in 2009. One explanation might be that, during the crisis, foreign aid disbursements (measured by programmable aid) increased by 26% rate between 2007 and 2009 (see Figure 17). These inflows of aid allowed the government to increase its expenditure in agriculture, education and health. The range of policies carried out by the government covered programs to increase fertilizer uses, hiring of new teachers, constructions of schools, and programs to fight HIV/AIDS and malaria. As a result, public expenditure and aid inflows helped buffer the impact of the crisis on GDP growth.

**Figure 16.** Vulnerability to different shocks (data for 2007 and 2009)



Note: Numbers in parenthesis indicate the relative share of ODA, FDI and Remittances over GDP.  
Source: WDI 2010 and WEO 2010

**Figure 17.** Programmable aid in Zambia



Source: Programmable aid in 2008 million US dollars, OECD

## VI. Conclusion

For many individual LDCs 2009 does not stand out as an extraordinarily bad year. LDCs showed unexpected growth resilience and their average growth rate remained high by historical standards. What differs from past crises was that output declines across LDCs and other countries were unusually synchronized. LDCs, less open and less financially integrated in the global economy were thus less affected than expected due to the nature of the crisis by itself. Moreover LDCs benefited from higher growth rates from 2000 to 2007 and then entered the crisis with a better economic situation than in the past.

The sharp growth declines observed in LDCs in 2008–09 are on average well explained by the magnitude of the external shocks which they faced over the period. LDCs were affected by the global crisis through a decline in the global demand rather than adverse terms of trade as it occurred in past shocks.

Finally, the data suggest few robust relationships. One of them is the role of foreign aid to dampen the effect of external shocks. Foreign aid which has been on an upward trend since 2000 did not fall during the crisis in LDCs and buffered the impact of external shocks. Interestingly, net flows of FDI were also not severely affected by the global financial crisis.

LDCs showed resilience during the peak of the crisis, and were able to recover quickly in 2010, registering a higher growth rate of 5.7 percent. However in a context of a dire state of the global economy reflected by commodity prices weakness, LDCs major buffers will be needed to face other large negative external shocks. For instance, a deterioration of the terms of trade will remain a central issue in LDCs and might dampen their abilities to build up their international reserves which were clearly used as an adjustment factor in 2007-9.

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## VIII. Annex

**Table 14.** List of LDCs

Afghanistan	Gambia, The	Rwanda
Angola	Guinea	Samoa
Bangladesh	Guinea-Bissau	São Tomé and Príncipe
Benin	Haiti	Senegal
Bhutan	Kiribati	Sierra Leone
Burkina Faso	Lao PDR	Solomon Islands
Burundi	Lesotho	Somalia
Cambodia	Liberia	Sudan
Central African Republic	Madagascar	Tanzania
Chad	Malawi	Timor-Leste
Comoros	Maldives	Togo
Congo, Dem. Rep.	Mali	Tuvalu*
Djibouti	Mauritania	Uganda
Equatorial Guinea	Mozambique	Vanuatu
Eritrea	Myanmar	Yemen, Rep.
Ethiopia	Nepal	Zambia
	Niger	

**Table 15.** Cross-Country Quartiles Analysis for All Non-Fuel-Exporting LICs and MIC

	Variables 1/	Countries with small impact on growth (1)		Countries with big impact on growth (2)		Difference (2 - 1)		2/
		Median	Mean	Median	Mean	Median	Mean	
1	2007-09 Change in per capita real GDP growth	0.1	0.9	-10.1	-13.1	-10.2	-14.0	***
2	2005-07 Change in per capita real GDP growth	0.0	0.1	2.0	2.4	2.0	2.3	**
3	2007-09 Change in external demand growth	-5.3	-5.4	-6.2	-7.4	-0.9	-2.0	***
4	2007-09 Change in external demand growth * exports/GDP	-0.9	-1.3	-5.2	-6.6	-4.3	-5.3	**
5	2007-09 Change in terms-of-trade growth	4.7	8.2	-0.4	4.9	-5.0	-3.3	
6	2007-09 Change in terms-of-trade growth * trade/GDP	1.4	3.2	-0.5	1.6	-1.9	-1.6	
7	2007-09 Change in FDI as a share of GDP	-0.2	-1.0	-2.6	-3.4	-2.4	-2.4	*
8	2007 Fiscal balance/GDP	-2.6	-111.9	-0.7	-1.4	1.9	110.6	
9	2007 Debt/GDP	57	3483	34	43	-24	-3439	
10	2007 Exchange rate regime 3/	3.0	3.6	3.0	3.5	0.0	-0.1	
11	2007 Reserves/months of imports	4.8	5.4	3.7	5.1	-1.1	-0.2	
12	2007 Reserves/(short external liabilities + current account deficit)	2.4	5.1	0.6	0.7	-1.8	-4.3	**
13	2007 Current account/GDP	-6.2	-4.9	-10.7	-12.2	-4.6	-7.3	**
14	2007 FDI/GDP	2.6	4.7	8.7	10.5	6.1	5.8	***
15	2007 Remittances/GDP	5.9	7.5	2.3	3.4	-3.5	-4.1	**
16	Real per capita GDP growth in 2004-07 relative to 1990-2007	1.2	0.5	1.7	4.1	0.5	3.5	*
17	Credit growth: Private sector during 2000-2007	1.6	3.0	8.1	10.2	6.5	7.2	**
18	2007 GDP per capita (US\$)	610	1183	5302	5363	4691	4180	***
19	2007 Share of commodities exports in GDP	3.3	5.9	1.3	3.7	-1.9	-2.3	
20	2007 Share of manufactures exports in GDP	2.8	5.0	13.5	15.2	10.7	10.3	***
21	2007 Openness (trade / GDP)	55.3	54.0	81.0	82.9	25.7	29.0	***

Note: 85 countries are included in this regression.

1/ This table is based on the same regression as Table 3/ Table 32/ Unless otherwise noted, ratios, shares and growth rates are in percent, and changes in percentage points.

3/ Levels of significance of difference in means indicated as follows: 1% (\*\*\*), 5% (\*\*) and 10% (\*).

4/ Measured on a scale of 1 to 6, with 1 representing hard pegs and 6 freely floating regimes.

Source: IMF database.

**Table 16.** Cross-Country Quartiles Analysis for All Non-Fuel- LICSand MICSexcept for LDCs

	Variables 1/	Countries with small impact on growth (1)		Countries with big impact on growth (2)		Difference (2 - 1)		2/
		Median	Mean	Median	Mean	Median	Mean	
1	2007-09 Change in per capita real GDP growth	-1.1	-0.2	-12.8	-15.0	-11.7	-14.8	***
2	2005-07 Change in per capita real GDP growth	0.2	0.5	2.0	1.6	1.8	1.2	
3	2007-09 Change in external demand growth	-5.6	-5.8	-7.4	-8.0	-1.8	-2.2	***
4	2007-09 Change in external demand growth * exports/GDP	-6.4	-4.1	-3.8	-3.4	2.6	0.7	
5	2007-09 Change in terms-of-trade growth	0.0	-1.6	-0.8	0.8	-0.8	2.4	
6	2007-09 Change in terms-of-trade growth * trade/GDP	0.0	-1.2	-0.6	0.3	-0.6	1.6	
7	2007-09 Change in FDI as a share of GDP	-0.2	-0.5	-2.8	-4.5	-2.7	-4.0	**
8	2007 Fiscal balance/GDP	-1.3	-5310	-1.9	-2.0	-0.7	5308	
9	2007 Debt/GDP	40	24034	30	50	-10	-23984	
10	2007 Exchange rate regime 3/	3.0	3.6	5.0	3.7	2.0	0.1	
11	2007 Reserves/months of imports	5.1	5.7	3.8	4.1	-1.3	-1.6	
12	2007 Reserves/(short external liabilities + current account deficit)	1.7	5.7	0.6	0.8	-1.1	-4.9	*
13	2007 Current account/GDP	-1.4	-3.1	-15.3	-16.4	-13.9	-13.2	***
14	2007 FDI/GDP	2.8	4.6	9.2	12.5	6.4	7.9	***
15	2007 Remittances/GDP	3.8	6.1	2.8	4.4	-1.0	-1.7	
16	Real per capita GDP growth in 2004-07 relative to 1990-2007	1.4	1.3	1.8	3.7	0.4	2.4	
17	Credit growth: Private sector during 2000-2007	2.0	2.1	6.6	11.5	4.6	9.4	***
18	2007 GDP per capita (US\$)	1843	2272	5336	6191	3493	3919	***
19	2007 Share of commodities exports in GDP	4.7	6.4	1.8	2.8	-3.0	-3.6	*
20	2007 Share of manufactures exports in GDP	6.0	8.9	11.7	12.3	5.6	3.4	
21	2007 Openness (trade / GDP)	62.9	67.1	77.3	79.1	14.3	12.0	

Note: 57 countries are included in this regression.

1/ This table is based on the same regression as Table 3 Table 3

é/ Unless otherwise noted, ratios, shares and growth rates are in percent, and changes in percentage points.

"/ Levels of significance of difference in means indicated as follows: 1% (\*\*\*), 5% (\*\*) and 10% (\*).

4/ Measured on a scale of 1 to 6, with 1 representing hard pegs and 6 freely floating regimes.

Source: IMF database .

**Table 17.** Cross-Country Quartiles Analysis for All Non-Fuel-Exporting LDCs

	Variables 1/	Countries with small impact on growth (1)		Countries with big impact on growth (2)		Difference (2 - 1)		
		Median	Mean	Median	Mean	Median	Mean	2/
1	2007-09 Change in per capita real GDP growth	1.3	1.9	-7.2	-7.4	-8.5	-9.3	***
2	2005-07 Change in per capita real GDP growth	-0.5	-1.0	1.5	1.8	2.0	2.8	
3	2007-09 Change in external demand growth	-5.1	-5.1	-5.5	-5.6	-0.4	-0.5	
4	2007-09 Change in external demand growth * exports/GDP	-0.4	0.3	-14.4	-11.1	-14.0	-11.3	***
5	2007-09 Change in terms-of-trade growth	8.2	9.8	0.0	-10.0	-8.2	-19.8	
6	2007-09 Change in terms-of-trade growth * trade/GDP	4.0	3.9	0.0	-6.7	-4.0	-10.6	
7	2007-09 Change in FDI as a share of GDP	0.0	-0.3	-0.7	0.8	-0.7	1.1	
8	2007 Fiscal balance/GDP	-2.5	-3.4	-0.6	-0.7	1.9	2.7	
9	2007 Debt/GDP	101	278	37	36	-64	-242	
10	2007 Exchange rate regime 3/	2.0	2.7	3.0	3.4	1.0	0.7	
11	2007 Reserves/months of imports	4.8	4.7	3.6	4.4	-1.2	-0.3	
12	2007 Reserves/(short external liabilities + current account deficit)	3.4	2.8	0.4	0.7	-3.0	-2.1	*
13	2007 Current account/GDP	-6.1	-3.9	-8.2	-10.5	-2.1	-6.6	
14	2007 FDI/GDP	2.0	2.4	5.5	6.5	3.5	4.1	*
15	2007 Remittances/GDP	6.2	7.4	1.0	3.9	-5.2	-3.5	
16	Real per capita GDP growth in 2004-07 relative to 1990-2007	0.6	-0.6	1.4	3.8	0.8	4.3	
17	Credit growth: Private sector during 2000-2007	2.8	5.7	8.7	9.0	5.8	3.3	
18	2007 GDP per capita (US\$)	420	569	627	1248	207	678	
19	2007 Share of commodities exports in GDP	1.4	4.0	0.4	0.5	-1.0	-3.4	
20	2007 Share of manufactures exports in GDP	2.9	5.1	1.1	2.7	-1.7	-2.4	
21	2007 Openness (trade / GDP)	50.7	50.4	67.3	74.7	16.6	24.3	*

Note: 37 countries are included in this regression.

1/ This table is based on the same regression as Table 3 Table 3

3/ Unless otherwise noted, ratios, shares and growth rates are in percent, and changes in percentage points.

3/ Levels of significance of difference in means indicated as follows: 1% (\*\*\*), 5% (\*\*) and 10% (\*).

4/ Measured on a scale of 1 to 6, with 1 representing hard pegs and 6 freely floating regimes.

Source: IMF database.





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