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**Simulating the Impact of the Global
Economic Crisis and Policy
Responses on Children in Ghana**

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Summary: Like many countries in sub-Saharan Africa, Ghana is experiencing the impact of the global crisis and the uncertain economic outlook. Indeed, as Ghana's economy is among the most open in Africa, it is expected that the country has been and will continue to be severely affected by the crisis, although strong export prices of its main exports (gold and cocoa) may at least partially counteract the effects associated with the crisis.

The main goal of this paper is to understand the potential impacts of the 2008/9 global crisis on different dimensions of child poverty (monetary, hunger, school participation, child labour and access to health services) in Ghana and to support the policy-maker in designing the most appropriate policy response to counteract the negative effects of the crisis. As timely data are not available, a combined macro-micro economic model to predict the impact of the global crisis on children was developed.

Simulations suggest that the financial crisis would increase monetary poverty and hunger across all regions of Ghana, eroding many of the gains made over the past few years. Indeed, in comparison with the year preceding the crisis, instead of a reduction of four percentage points in child monetary poverty in 2011 predicted in the absence of crisis, the simulations indicate a 6.6 percentage point increase, with a continuous increasing pattern over the period of study. The global crisis is also predicted to severely deepen hunger among children, which is simulated to increase up to 6.6 percentage points in 2011 beginning with a sharp increase already in 2009. For both monetary poverty and hunger, the impact of the crisis differs across all regions, with the Eastern, Volta and Greater Accra regions predicted to be the most affected. Children's participation in schooling and labour, as well as their access to health services, are forecast to be much less affected by the crisis, although it is found to reverse predicted increases in enrolment and health access (with substitution toward more modern types of health services) and forecasted reductions in child labour.

Finally, alternative policy options have been simulated: a cash transfer programme targeted to poor children is found to be generally more effective in protecting children than food subsidies. Indeed, with a total budget equivalent to 1% of 2008 GDP, a cash transfer – equivalent to an individual annual amount of 19.8 *Cedis* – would cut the predicted increase in monetary poverty by over two percentage points in 2011.

Although Ghana might be in a position to rapidly implement a cash transfer programme building on the existing Livelihood Empowerment against Poverty (LEAP) programme, other interventions (or mix of policies) might be more cost-effective in the short run. A combination of a universal or regionally targeted cash transfer programmes for children aged 0 to 5 years old, together with a school-feeding programme in poorer regions, might represent an effective way to intervene quickly to improve child well-being.

Key Words: global economic crisis, child poverty, hunger, education, child labour, health, West and Central Africa, Ghana, social protection

JEL Codes: D58, H31, I18, I21, I32

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A UNICEF-PEP Africa Research Project on the Impact of the Global Economic Crisis on Children in Western and Central Africa

This study assesses the potential effects of the global economic crisis on children in Burkina Faso, Cameroon and Ghana and the proposal of concrete policy responses to the policy makers. It is the result of a research project promoted by the Regional Office of UNICEF for West and Central Africa and led by the African office of the Poverty and Economic Policy (PEP) research network, in collaboration with the UNICEF Innocenti Research Centre and the UNICEF Division of Policy and Practice. PEP is financed by the Government of Canada through the International Development Research Centre (IDRC) and the Canadian International Development Agency (CIDA), and by the Australian Agency for International Development (AusAID). PEP's African office (PEP-Africa) is based at the Consortium pour la recherche économique et sociale (CRES, Dakar).

A regional and three country teams of researchers were formed. The regional team, coordinated by PEP-Africa, was composed of researchers from Africa (GREAT, Mali; University of Yaoundé, Cameroon), from the Université Laval in Canada and the UNICEF Innocenti Research Centre. The regional team developed the basic methodology, provided training and closely supervised the three country studies, and prepared a regional report and policy brief synthesizing the results for the three countries. The country teams led the country analyses, interacted with the local policy committees and wrote their respective country reports.

This research was initiated in June 2009: at the end of that month the regional team provided the methodology and held in Accra an intensive training workshop for the local teams. A visit to each country followed in August. In the following months the regional and country teams carried out the analyses and presented the preliminary results of the study in November and December at the WCARO Social Policy Network Meeting in Dakar, the ODI-UNICEF conference on "The global economic crisis – Including children in the policy response" in London and the AERC conference on "Rethinking African Economic Policy in Light of the Global Economic and Financial Crisis" in Nairobi. In the following two months the regional and country studies were finalized by including also some additional policy responses ad hoc to each country.

The main outcomes of this project are:

- Cockburn, J., I. Fofana and L. Tiberti (2010), "Simulating the Impact of the Global Economic Crisis and Policy Responses on Children in West and Central Africa", *Innocenti Working Paper* No. 2010-01, UNICEF Regional Office for West and Central Africa, Dakar, and UNICEF Innocenti Research Centre, Florence.
- Bibi, S., J. Cockburn, I. Fofana and L. Tiberti (2010), "Impacts of the Global Crisis and Policy Responses on Child Well-Being: A Macro-Micro Simulation Framework", *Innocenti Working Paper* No. 2010-06, UNICEF Regional Office for West and Central Africa, Dakar, and UNICEF Innocenti Research Centre, Florence.
- Balma, L., J. Cockburn, I. Fofana, S. Kaboré and L. Tiberti (2010), "Simulation des effets de la crise économique et des politiques de réponse sur les enfants en Afrique de l'Ouest et du Centre: Le cas du Burkina Faso", *Innocenti Working Paper* No. 2010-03, UNICEF Regional Office for West and Central Africa, Dakar, and UNICEF Innocenti Research Centre, Florence.
- Bibi, S., J. Cockburn, C.A. Emini, I. Fofana, P. Ningaye and L. Tiberti (2010) "Incidences de la crise économique mondiale de 2008/09 et des options de politiques de réponse sur la pauvreté des enfants au Cameroun", *Innocenti Working Paper* No. 2010-04, UNICEF Regional Office for West and Central Africa, Dakar, and UNICEF Innocenti Research Centre, Florence.
- Antwi-Asare, T., J. Cockburn, E. F. A. Cooke, I. Fofana, L. Tiberti, D. K. Twerefou (2010) "Simulating the impact of the global economic crisis and policy responses on children in Ghana", *Innocenti Working Paper* No. 2010-05, UNICEF Regional Office for West and Central Africa, Dakar, and UNICEF Innocenti Research Centre, Florence.
- Bibi, S., J. Cockburn, M. Coulibaly, and L. Tiberti (2009) "The Impact of the Increase in Food Prices on Child Poverty and the Policy Response in Mali" *Innocenti Working Paper* No. 2009-02, UNICEF Regional Office for West and Central Africa, Dakar, and UNICEF Innocenti Research Centre, Florence

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List of Abbreviations

BaU	Business as Usual
BOG	Bank of Ghana
CGE	Computable General Equilibrium
CIEA	Composite Index of Economic Activity
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
Ghc	Ghana <i>Cedis</i>
GIPC	Ghana Investment Promotion Centre
GLSS	Ghana Living Standard Survey
LEAP	Livelihood Empowerment Against Poverty
MOFEP	Ministry of Finance and Economic Planning
NHIL	National Health Insurance Levy
PRGF	Poverty Reduction and Growth Facility
SAM	Social Accounting Matrix
VAT	Value Added Tax

INTRODUCTION

The direct impact of the 2008-2009 global economic crisis in sub-Saharan Africa, through reduced foreign trade and capital inflows, has been well recognized and discussed by many development experts. The crisis has to some extent eroded many of the macroeconomic gains made by most sub-Saharan African countries. Specifically, the economy-wide effects range from declining investment in public services to diminished access to credit, and from growing employment imbalances and diminished consumption capacities to potentially heightened social exclusion. Furthermore, reductions in fiscal resources and aid available to governments have affected public service delivery, not just in education, health, sanitation and water, but also in areas such as social protection.

In terms of labour supply, evidence from past crises in poor countries suggests that the global crisis is likely to disproportionately and negatively affect employment, frequently leading to longer working hours and a move into riskier and lower status forms of employment or informal jobs, as well as an increased involvement of children in work related activities (Woldehanna et al. 2008). There is ample evidence of this from the crises in Thailand and South Korea in the late 1990s (Shin 1999; Kim and Voos 2007; United Nations 2003).

This research aims at shedding some light on the potential impact of the current global economic crisis on child well-being and proposing alternative policy options to the government to protect the development of children and to intervene before the potential detrimental effects brought by the crisis become long-lasting. As complete data are not yet available on these impacts, we propose an *ex-ante* layered macro-micro simulation approach. Specifically, at the macro level we simulate through a CGE model the impact of the crisis through predicted changes in foreign direct investments, trade, remittances and international aid. Changes in incomes and prices generated by the CGE model are then integrated into a micro-behavioural simulation model and, finally, results generated from the latter are used to estimate variations in the various dimensions of child poverty. In particular, the effects on child monetary poverty, hunger, child school and labour participation, and access to health care are simulated.

The rest of the report is presented in four sections. Following this introduction, section two provides the context for the study; section three discusses the analytical framework, whilst section four presents the results of the simulated scenarios. Finally, the last section summarizes the main findings and the implications of the research.

1. CONTEXT

Like many countries in sub-Saharan Africa, Ghana is experiencing the impact of the global crisis and the uncertain economic outlook. As Ghana's economy is among the most open in Africa, it is expected that it will be severely affected by the crisis, although strong export prices of its main exports (gold and cocoa) may at least partially counteract the effects of the crisis. Private remittances are falling, foreign direct investment appears to be lower with few near term prospects for new state divestitures, and official access to global market financing has suffered a set-back.

These developments have had a direct impact on the balance of payments, domestic demand, and economic growth. At the same time, currency pressures have triggered higher inflation, requiring tighter monetary policy, with further adverse impact on economic activity.

The degree of economic slowdown in 2009 remains uncertain, as quarterly GDP data were not compiled in Ghana at the time this document was drafted. The Bank of Ghana's Composite Index of Economic Activity (CIEA) at the end of May 2009 declined by 2.2% compared to a year earlier in real terms, suggesting real GDP growth below the 5% mark, down from the peak of 7.3% in 2008. Similarly, the Bank of Ghana's survey of business and consumer confidence in June 2009 reported a decline in optimism compared to the April 2009 survey.

The crisis is having a clear impact on government revenue, with domestic VAT collections falling 27% below target levels in the first half of 2009 and corporate income taxes 17% below target, on the same basis. At the same time, financing for the budget has been adversely impacted. No financing from sovereign market access and divestitures to foreign investors is projected for 2009-2010, compared to financing in the 4-6% of GDP range during 2007-2008.

In the balance of payments, lower remittances and a decline in capital inflows contributed to a sharp decline in foreign reserve coverage in late 2008 and the first half of 2009. Notwithstanding this support for the balance of payments, the Ghana national currency (*cedi*) depreciated significantly through late 2008 and into 2009, with a pass through to domestic inflation. Accordingly, the 12-month inflation rate rose from the 10% range a year earlier to close to 20% through the first half of 2009. A significant contribution to this trend came from imported goods and services, including a 30% rise in petroleum product prices.

The effects of the financial and economic crisis remain uncertain. Indeed, the prospects of a further slowdown in global demand, stagnation or even a decline in remittance flows are likely to diminish the prospects of growth in 2009 below expectations. The magnitude and spill over of the global slowdown emanating from the global crisis may be more pronounced than expected. The global outlook is uncertain and financial strains persist. A general lack of confidence in the economy may lead to a deeper recession, curtail trade finance, and constrain global trade. Downward pressure on economic activities could worsen especially with Ghana's trade partners where there are very close trade and financial linkages. The short-term poverty impact of the current crisis will be compounded if domestic prices for fuel and food remain relatively high. In Ghana, fiscal space for cushioning the impact on the poor is minimal, transfer mechanisms are not well targeted, and putting new transfer systems in place takes time, money and administrative capacity.

Due to fiscal slippages during 2008, when the deficit rose to exceed 14% of GDP and public debt rose sharply, Ghana does not have the fiscal space to adopt counter-cyclical fiscal policies to cushion its citizens against the global crisis. Indeed, the planned fiscal consolidation in 2009 and later years is being compounded by the fall in budget access to market financing and divestiture funding.

Moreover, reflecting balance of payment pressures and rising inflation, monetary policy has been tightened in Ghana since the start of the global crisis, in contrast to the easing of monetary policy in most sub-Saharan African countries.

Existing social protection includes the “lifeline” scheme to reduce utility costs at low-usage levels, the Livelihood Empowerment Against Poverty (LEAP) targeted cash transfer programme, and a school feeding programme. Other policies include grants and subsidies for education (capitation grants, subsidy for basic education certificate examination, a subsidy for senior high schools), and national youth employment programmes. However, financing to expand current poverty-reducing programmes and social protection schemes for the most vulnerable households will prove critical.

In response to the global crisis, the Government of Ghana has initiated various strategic interventions to extend the social protection net and measures are being adopted in areas that appear particularly at risk. For example, the government has made a provision of GHC30 million in the 2009 budget for the provision of potable water. This intervention is to help reduce the incidence of water-borne diseases as well as the eradication of the guinea worm pandemic in the rural and affected communities. Equally, the government would like to extend financial support to the pro-poor households under the LEAP programme from 18,000 households currently to 35,000 households.

As much as the government wants to mitigate the risks associated with slower growth for low income and vulnerable groups, the fiscal ability to provide social protection and safety nets is constrained by the need to restore fiscal discipline in order to minimize the risks of macroeconomic instabilities. The Government therefore is having difficulty strengthening existing programmes. Accordingly, the budget provision for potable water is insufficient to meet the growing demand from the communities affected by the guinea worm pandemic, and the intended scaling up of the LEAP programme may not be feasible, given financing constraints.

Reflecting the growth slowdown in 2009 discussed above, revenue performance has deteriorated. Although currency depreciation is providing temporary support to import tax collections, domestic revenues are experiencing large shortfalls. For the first half of 2009, shortfalls have been particularly important for domestic VAT, the national health insurance levy (NHIL) and corporate taxes. Unless performance in these and other domestic taxes strengthens in the second half, the overall shortfall in domestic revenues on account of the global economic crisis could be as large as 1.8% of GDP (Table 1).

Faced with these potential revenue shortfalls, the government has adopted a number of new revenue measures that should support collections in 2009. These include a stabilization levy (new 5% corporate income tax), an increase in the airport departure tax, cutbacks in tax exemptions, and new fees and licenses. The projected yield of these measures is estimated at 0.6% of GDP.

Ghana’s foreign reserves at end-June 2008 were \$2.6 billion, or 2.8 months of projected imports of goods and services, declining to \$2.0 billion at end 2008 (2.2 months of import coverage).

By end-March 2009, reserves had fallen further to \$1.75 billion (1.7 months of import coverage). The decline in foreign reserve coverage in late 2008 and early 2009 was directly linked to the global financial crisis. In particular, the balance of payments deteriorated on account of the factors described below.

Table 1: Revenue developments in the first half of 2009

Revenue Type	Budget projection for 2009 (GHc million)	Deviation from target in first half 2009 collections (in %)	Potential full-year shortfall (GHc million)
Domestic VAT	577	-26.8	-155
Domestic excises	63	-1.6	-1
Domestic NHIL	392	-26.8	-105
Communications services tax	60	-9.5	-6
Personal income tax	663	1.4	9
Corporate income tax	688	-17.5	-120
Total of above	2443		-378
per cent of GDP	-11.3		-1.8

Source: MOFEP

Remittance inflows appear to have been affected by the crisis. Individual foreign inward transfers have fallen sharply since January 2009 perhaps due to the fact that Ghanaian workers abroad are losing their jobs or accepting lower wages because of the global economic downturn. Net inward private transfers fell from 507.63 million US\$ in the first quarter of 2008 to 397.08 million US\$ the first quarter of 2009.

Data compiled by the Ghana Investment Promotion Council on foreign direct investments shows that inward investments in the first quarter of 2009 was only one-third of the level of a year earlier (Table 2).

Table 2: Value of foreign direct investments, 2008-2009 (million US \$)

	Q1 2008	Q1 2009
Joint Ghanaian-Foreign projects	3.0	5.4
Wholly-owned foreign enterprises	46.1	12.7

Source: Ghana Investment Promotion Council

In the area of portfolio investments, Ghana benefited in 2007 and early 2008 from non-resident investments in the domestic treasury bill market. As risk aversion increased following the global financial crisis, these investments were partly liquidated in late-2008 and early-2009. Ghana issued a debut Eurobond in late-2007 and was considering further market placements in late-2008. These were cancelled when Ghana's market access was effectively closed as a result of the global crisis. With regard to privatization proceeds, the country experienced inward capital investments associated with divestitures in both 2007 and 2008. Given the increased risk aversion after the global financial crisis, further such revenues are not a near-term prospect.

Table 3: Balance of payments, 2007-2009

In millions of dollars	2007	2008	2009
Crisis-affected BOP components	<u>4,052</u>	<u>4,140</u>	<u>2,184</u>
Private transfers	1,834	1,970	1,367
Official capital flows (1)	1,145	538	491
Private capital flows (including errors/omission)	1,073	1,632	326
Other BOP components	<u>-3,639</u>	<u>-5,081</u>	<u>-2,838</u>
Trade balance	-3,894	-4,999	-3,513
Services and income flows	-305	-758	-442
Official transfers	560	676	719
Oil sector investments	0	0	398
Overall balance	413	-941	-654
Gross foreign reserves (2)	2,837	2,036	1,500
Months of import cover	2.7	2.2	1.5

Source: MOFEP and IMF projections for PRGF arrangement.

Notes: 1) Before exceptional financing from World Bank and bilateral sources; 2) Gross reserves in 2009 are measured before exceptional financing from IMF, World Bank and bilateral creditors.

The private remittance and capital flows in table 3 are projected at \$2.2 billion in 2009, down from more than \$4 billion in the preceding two years. This shortfall more than accounts for the projected deficit in the balance of payments in 2009 and for the continuing decline in foreign reserves. Without any exceptional financing in 2009, gross reserves would decline to a projected \$1.5 billion (1.5 months of import cover). With \$450 million of exceptional financing from the World Bank, IMF, and other bilateral creditors, foreign reserves would be stabilized in 2009 at a projected \$1.95 billion (1.5 months of import cover).

2. METHODOLOGY

The study adopts the layered macro-micro methodology developed by Bibi, Cockburn, Fofana, and Tiberti (2010). In this section we summarize the methodology and elaborate on some specific issues in the case of Ghana. Evidently, the global economic crisis at the macro level will affect world commodity prices, foreign aid, FDI and remittances, which will affect local product and factor markets, government finances and international trade in diverse ways. Fluctuations in these variables ultimately determine changes in household incomes, through changes in incomes and consumer prices, which consequently affect various dimensions of child well-being.

At the macro level, simulations are run with a CGE model, which is a multi-market model of an economy based on real world data and which uses rigorous microeconomic and macroeconomic equations to simulate the behavior of economic agents. We begin by improving the 2005 SAM constructed by the Ghana Statistical Service. First the SAM is updated to 2008 macroeconomic figures. Also, the shares of labour categories were further disaggregated using information from the Ghana Living Standard Survey (GLSS 5) into six categories as shown in table 4. This SAM was used to run the CGE model. The GLSS 5 is a nationally representative household survey that integrates socio-demographic and economic information on households and individuals, including children. Information on prices of the commodity bundles was obtained from the price data base of the Ghana Statistical Service and other international sources.

Table 4: Structure of aggregate 2008 SAM

27 Sectors and Commodities	<ul style="list-style-type: none">• 12 agricultural categories• 3 industries• 12 services
7 Factors of Production	<ul style="list-style-type: none">• 1 capital• 6 labour categories (rural formal labour, urban formal skilled labour, urban formal unskilled labour, rural informal labour, urban informal skilled labour, urban informal unskilled labour)
2 Households	<ul style="list-style-type: none">• 1 rural• 1 urban

After the macro and the micro models are made consistent and changes in prices, revenues and employment rates generated by the macro simulations are fed into the micro model, we are able to estimate the potential effect of the crisis and alternative policy options on child welfare.

Changes in child monetary poverty under the different scenarios simulated in this analysis are captured through a Cobb-Douglas approach, using household specific preferences but with fixed budget shares. Aggregate household consumption, deflated by a per adult equivalent scale based on minimum caloric needs and by relevant spatial and temporal deflators, is the variable used to assess changes in monetary poverty, according to the Ghana absolute poverty line (37.089 in new *Cedis*). Changes in real consumption are affected by two main channels: income and consumer prices. Changes in household income are the result of the sum of changes in incomes from: wages (affected by variations in both wage and employment rates); self-employment in agriculture and non agriculture sectors; transfers (public and private transfers and dividends). Changes in consumer prices affect real consumption through household purchasing power.

Per adult equivalent food quantities consumed in the base year and those simulated under the different scenarios for each consumption category are used to estimate changes in hunger rates. With the help of Ghana-specific nutritional tables (Eyeson and Ankrah 1975), we translated the food quantities consumed into calories, calculated the hunger rate by comparing the per adult equivalent calorie intake with the daily caloric requirement, which is assumed to be equal to 2450 kcal. Calorie intakes are affected across the different scenarios by changes in household income (which are obtained as described above), and by changes in food prices, as these modify the quantities of food consumed. Unfortunately, GLSS5 does not contain information on consumer prices, which provide the best price data for such an analysis. We were thus obliged to use official consumer price data by region, further disaggregated into urban and rural areas, which might result in an overestimation of the child hunger rate to the extent that households pay lower prices or consume lower quality goods. However, as we are primarily interested to see how the crisis and policy responses to it can potentially affect the calorie intake, the quality of data is likely to affect less the absolute levels than subsequent variations in absolute levels.¹

¹ See Cockburn, Fofana and Tiberti (2010) for a detailed discussion on this issue and the appropriateness of using calorie intake to estimate the hunger rate.

For both monetary poverty and hunger, we will show the estimated headcount and poverty gaps for the child population (younger than 15 years old) in the base year as well as those simulated under the different scenarios. In addition to the national rates, we will show results by different break-downs to capture within country differences, namely by region, locality (urban/rural), number of children living in the household, and gender of the household head.

To investigate the effects, in each simulation scenario, of changes in real consumption on the probability that a child goes to school and/or to work,² we identified four situations: i) school-no work; ii) school-work; iii) no school-work; iv) no school-no work. We employed a bivariate probit regression estimating the joint probability of a child attending school and working on individual/household/community characteristics and real adult equivalent consumption. We then compared the predicted average probability of children being in each of the four situations in the base year and in each subsequent year according to the different scenarios: absence of the crisis, crisis and different policy responses.

Lastly, to investigate the change in real consumption on the probability of ill children asking for a health consultation, we ran a logit model with a binary dependent variable taking value 1 if a sick child had a health consultation and 0 otherwise. Individual, household and community characteristics, as well as real adult equivalent consumption, were the explanatory variables. In order to ascertain if there is substitution towards a different type of health facility as a result of the crisis, among those who had a consultation we ran a multinomial-logit model with a dependent variable taking value 1 if the child visited a hospital, 2 if s/he visited a clinic, 3 if s/he visited a pharmacy or chemical store and 4 if other health facilities were consulted: traditional healers, consultants or patient's home. Again, individual, household and community characteristics and the real adult equivalent consumption were the explanatory variables.

We then used this model to predict the probabilities of ill children accessing a health facility (logit regression) and the choice of health care facility (multinomial logit regression) for each simulation scenario. We then calculated the average percentage change between the predicted probabilities in the base year and the predicted probabilities under the different scenarios.

Then, one of the simulated policies (targeted cash transfers to poor children) required us to develop a tool helping the identification of poor children, as government would be required to in implementing such a programme. To do this, we needed to construct a micro-econometric model that, based on easily observable individual, household and community characteristics, was able to correctly predict household consumption and, therefore, the poverty status of each child. A proxy-means approach was used and, specifically, followed a quantile regression. For more details on the model see Bibi, Cockburn, Fofana and Tiberti (2010). Table A in Annex II lists the variables used in the model and their estimated coefficients in predicting (the log of) real household income per adult equivalent.

² A child is defined as involved in a work activity if s/he did any domestic work for at least 28 hours in a week and/or any economic activity (irrespective of the hours spent on it) if the child is less than 12 years old, and more than 14 hours a week if 12 and older. This is the definition of child labour adopted for the elaboration of MICS data as reported by www.childinfo.org; for further information see the child protection sub-section included there.

Finally, the data for the micro analysis come from the Ghana Living Standard Survey, carried out in 2005/06. The “base year” of our analysis thus corresponds to 2005/06, and we made the hypothesis – strong but necessary in the absence of reliable data – that both the distribution and the level of consumption and revenues did not change between the year of the survey and the base year (i.e. the year preceding the crisis) of our analysis.

3. SIMULATION SCENARIOS AND RESULTS

The study first simulates two sets of scenarios: the business as usual (BaU) or baseline scenario (without crisis), and the crisis scenario. The BaU scenario is based on the hypothesis that changes in variables linking Ghana’s economy to the global economy follow historical (pre-crisis) trends. The crisis scenario, based on recent information (observed or projected) on the situation of the global economy, assumes a decline in the variables that transmit the global crisis to the local economy (import prices, export volumes, remittances, FDI and foreign aid; hereafter “transmission variables”) in 2009,³ then their stagnation in 2010 except for commodity prices that rebound and, finally, a recovery in 2011 as all transmission variables resume historical trends, albeit from a lower base than in the BaU, in 2011. These scenarios are discussed in detail in Cockburn, Fofana and Tiberti (2010). Government per capita expenditures are assumed to remain constant and the increase in the government deficit, induced by the fall in tax revenues and foreign aid inflows, is assumed to be covered through increased domestic borrowing.

Without the crisis (BaU), all transmission variables show increasing trends (table 1). However, the world prices of imports, after reaching historical records in 2007-8, are assumed to stagnate on average over the following three years. Changes in transmission variables stemming from the global economy downturn are also presented in table 5. The global crisis translates into absolute declines in the growth rates of the transmission variables in 2009 except for export volumes. However, the latter is also affected by the global economic downturn, as export volumes do not grow in the crisis as fast as in the BaU scenarios. In 2010, import prices start to increase by 10% on average, while other variables – export volumes, foreign investment, remittances, and foreign aid – stagnate. The latter variables recover in 2011 following their historical trends.

Table 5: Percentage change in transmission variables

	BaU			Crisis		
	2009	2010	2011	2009	2010	2011
Average world import price	0.0	0.0	0.0	-19.2	10.1	10.2
Export volumes	12.3	12.0	11.4	5.0	0.0	11.4
Foreign investment	11.0	9.9	9.0	-42.0	0.0	9.0
International aid	2.7	2.7	2.6	-14.0	0.0	2.6
Remittances	7.0	6.4	5.8	-11.6	0.0	5.8

Source: Authors’ elaborations based on simulations

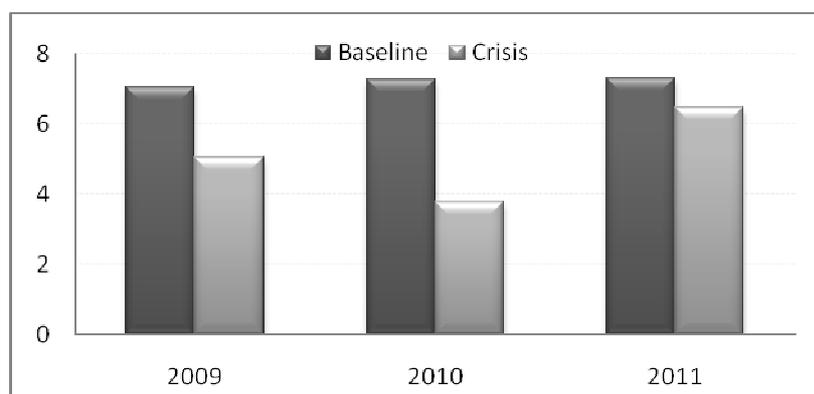
³ Years refer to the period ending in June. For example, “2009” refers to the period July 2008-June 2009.

4.1 Macro impacts

According to the simulations, without the global crisis Ghana would have maintained its real GDP growth rates at 7% over the period 2009-2011 (figure 1). With the crisis, the real GDP growth rates fall to 5.1 and 3.8% in 2009 and 2010, respectively, then increase to 6.5% in 2011, just below the BaU rate.

The GDP growth rate slows down in 2009 because of a significant decline in investment and, to a lesser extent, in final consumption (table 6). The deterioration of the latter in 2010 contributes to exacerbate the growth slowdown. Investment and final consumption recover in 2011 and contribute to the GDP growth during this period.

Figure 1: Simulated real GDP growth rates (per cent), annual change



Source: Authors' elaborations based on simulations

Table 6 records annual changes in the components of GDP: final consumption, investment, and net exports. Under the BaU scenario these components grow strongly over the period 2009-2011. The economy under the crisis scenario shows much reduced growth rates for these variables, in particular investment and final consumption. Average growth rates of investment decline by 8.6%, compared to an increase of 13% under the BaU in 2009. Although the fall in investment growth rate lowers in 2010, the rebound in the global import prices contributes to deteriorate the purchasing power and reduces the final consumption.

Table 6: Simulated change in components of GDP (per cent)

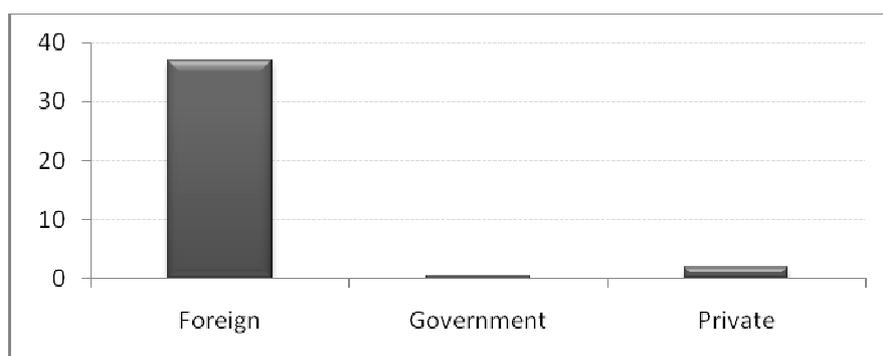
	Final consumption	Investment	Export	Import	Net export
Ratio to GDP	103.2	35.0	40.1	-77.0	-36.9
BaU (Annual change)					
2009	7.5	13.1	12.3	13.1	13.9
2010	11.5	16.8	12.0	19.6	27.6
2011	13.8	17.5	11.4	21.7	31.3
Crisis (Annual change)					
2009	0.4	-8.6	5.0	-7.2	-20.4
2010	-2.8	-1.7	0.0	-10.1	-24.5
2011	4.2	8.2	11.4	6.5	-2.8

Source: Authors' elaborations based on simulations

On the other hand, the fall in import prices reduces the country's trade deficit (negative net exports), in particular during the first and second years of the crisis.

The importance of foreign investment in the country (figure 2) renders it particularly vulnerable to its reduction during the crisis. However, Ghana's greater exposure to external trade, associated with favorable terms of trade development and the continuing strong export prices for its two main exports (gold and cocoa), has contributed to substantially reduce its trade deficit and mitigate the adverse effects of the global crisis.

Figure 2: Structure of savings in 2008, percentage of GDP



Source: Authors' elaborations based on simulations

The decline in domestic prices simulated under the no-crisis scenario reverses in the crisis scenario. Without the crisis, consumer and value added (or factor) prices would have continued to decrease and increase, respectively, over the period of 2009-2011 (table 7). However, under the global crisis scenario, consumer prices increase because of the depreciation of the national currency, while value added prices fall because of higher input costs. The decline in external resources inflows – export revenues, remittances, foreign investment and aid flows – and the lesser reduction in import cost contribute to depreciate the exchange rate. This effect accentuates during the stabilization period (2010) with the expected rebound of world import prices. This contributes to lower final consumption and, consequently, to enhance the adverse effects of the global crisis during the stabilization period.

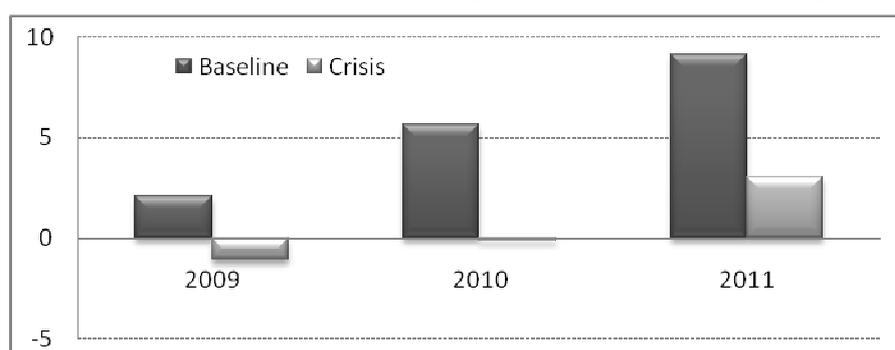
Table 7: Simulated annual changes in price indices (per cent)

	BaU			Crisis		
	Exchange rate	Consumer	Value added	Exchange rate	Consumer	Value added
2009	-6.0	-2.3	4.2	27.6	4.2	0.8
2010	-9.3	-3.8	5.5	3.0	5.8	-5.3
2011	-11.0	-3.9	6.3	-8.4	0.6	0.7

Source: Authors' elaborations based on simulations

Referring to figure 3, in the BaU scenario the Government primary budget balance remains in surplus and increases throughout 2009-2011. When the crisis scenario is simulated, it is in deficit over the crisis and the stabilization periods of 2009 and 2010 and returns to a surplus when the recovery of the pre-crisis growth pace comes in the 2011.

Figure 3: Simulated Government primary budget surplus (per cent of GDP)



Source: Authors' elaborations based on simulations

In the absence of global crisis, Ghana's strong economic growth would have increased the demand for both formal and informal work, resulting in an increase in the informal wage rate (table 8). Formal wage rates are fixed in real terms according to the short run perspective of the analysis. The crisis results in a lower growth rate for formal employment compared to the BaU scenario in 2009. More unemployed workers in the formal sectors increase the pressure in the informal labour market, which is translated into lower wages as compared to the BaU. The situation worsens in 2010 (stabilization period) when formal employment falls. More workers are pushed into the informal labour market and consequently the informal wage rate decreases. The last period 2011 shows a recovery in the labour market when formal and informal employment rebound, along with the informal wage rate (table 8).

Table 8: Simulated annual changes in wage rates and employment levels (per cent)

	Formal work		Informal work		Informal wage	
	BaU	Crisis	BaU	Crisis	BaU	Crisis
2009	3.1	2.0	2.2	3.0	10.8	6.7
2010	4.1	-0.6	1.5	4.9	13.4	-3.8
2011	4.1	1.8	1.5	3.2	15.0	5.9

Source: Authors' elaborations based on simulations

4.2 Impacts on children⁴

4.2.1 Monetary poverty under the baseline and crisis scenarios

Tables 9 and 10 present results for child monetary poverty in the base year and under the simulated scenarios in absence of crisis (BaU) and with the crisis for the 3-year period 2009-2011. Estimates for the base year indicate that the national monetary headcount poverty among children in Ghana was 33.7% (table 8), representing slightly more than 3.1 million children. However, there are large regional disparities in the incidence of poverty: the Eastern region shows the lowest child poverty (15.8%), followed by the Ashanti and Central regions, while the three northern regions have the highest child poverty rates ranging between 56.7% in Northern and 77.9% in Upper East, well above the national average.

⁴ If the reader is interested in the absolute numbers of children affected in the scenarios presented in this study (further to those already reported in the main text), then s/he can consult the percentages shown and discussed hereafter in the main text together with the relevant absolute numbers reported in table D in Annex II.

Significant differences also exist between urban and rural areas, with the latter showing a child poverty rate almost double that estimated for urban areas. Child poverty among children living in male-headed households is higher (36.1%) compared with female-headed households (25.9%). Also, child poverty is positively correlated with the number of children living in the household; while children without any siblings show a poverty rate of 14.7%, those living in households with 6 or more children face a dramatically higher risk of being poor (65.5%).

Table 9: Monetary headcount poverty in base year, BaU and crisis scenarios by region, sex, locality and number of children in the household

Headcount	Child pop. share (%)	Base year	BaU			Crisis		
			2009	2010	2011	2009	2010	2011
All Children	100	33.7	-0.9	-1.9	-4.1	1.5	6.1	6.6
Western	10.6	40.5	-1.4	-4.0	-7.5	2.3	6.5	6.6
Central	8.7	20.8	-2.5	-2.7	-6.0	1.8	5.4	6.0
Greater Accra	11.2	26.4	-0.4	0.0	-1.9	1.9	9.4	10.7
Volta	7.6	26.6	-0.5	-1.0	-2.0	2.4	10.5	11.0
Eastern	13.1	15.8	1.2	0.6	1.0	1.9	6.6	7.9
Ashanti	17.6	18.2	-0.5	-1.1	-3.6	2.4	6.4	6.9
Brong Ahafo	9.3	38.3	0.0	-1.8	-3.1	1.6	4.7	5.8
Northern	13.2	56.7	-4.1	-6.3	-10.1	-1.4	1.5	1.3
Upper East	4.9	69.9	1.3	0.7	-0.5	1.7	7.5	6.8
Upper West	3.7	77.9	-0.6	-2.2	-5.9	0.0	2.6	2.6
Rural	65.5	39.7	-1.6	-3.2	-6.2	0.9	4.5	4.4
Urban	34.5	22.4	0.4	0.6	0.1	2.7	9.1	10.9
Female hh head	23.2	25.9	0.4	0.1	-1.4	2.6	7.1	7.9
Male hh head	76.8	36.1	-1.3	-2.5	-4.9	1.2	5.8	6.3
1 child	11.6	14.7	0.5	0.2	-0.3	1.6	4.3	5.0
2 children	21.6	22.6	-0.5	-1.1	-2.0	2.1	7.6	8.7
3 children	24.9	27.8	-0.7	-1.3	-3.1	1.3	6.5	7.5
4 children	18.4	39.2	-0.9	-2.6	-4.5	2.4	6.5	6.5
5 children	11.4	44.4	-0.2	-0.7	-3.7	3.0	7.7	8.8
6 children or more	12.1	65.5	-3.7	-6.5	-12.9	-2.0	2.1	1.1

Source : Authors' elaborations using the results of the simulations

Note: Rates for the base year are estimated from the GLSS 5 and reported in their absolute values while those relative to the other scenarios are simulated and expressed as the difference in % points to the "base" value

Ghana's efforts at poverty reduction would have paid off in absence of the global crisis. The 'Business as Usual' scenario indicates that Ghana would have achieved poverty reduction of 0.9, 1.9 and 4.1 percentage points for 2009, 2010 and 2011 respectively in comparison with the base year (i.e. around 376,000 children would have escaped poverty by 2011).⁵ This is in line with the decreasing trend in poverty rates (Ghana Statistical Service, 2007) and with the sustained economic growth experienced by Ghana over the last decade. Without the crisis, all regions would have experienced some level of poverty reduction by 2011, with the exception of the Eastern region only. While the Western, Central and Northern regions would have experienced the greatest reduction in poverty by 2011, the Eastern region would have registered an increase in child poverty by 1 percentage point by 2011. This reduction in child monetary poverty is concentrated in rural areas with reductions of up to 6.2 percentage points in 2011, while in urban areas substantial stability over time would have been observed.

⁵ The absolute changes shown throughout this document already take into account the growth in the child population (0-14 years old) and the average annual value observed between 2004 and 2008 (=1.3%) has been used.

Children living in households headed by a male would have experienced a relatively greater reduction in poverty than children living in a female-headed household over the three year period. A notable observation is that the reduction in child poverty is positively correlated with the number of children.

Results from the simulations for the crisis scenario indicate that it would impact negatively on poverty and to a large extent erode the gains made in poverty reduction over the preceding years.⁶ The economic crisis would in fact increase the child poverty headcount by 1.5, 6.1 and 6.6 percentage points for 2009, 2010 and 2011 (corresponding to 630,000 additional children in poverty by 2011) respectively, thus making government intervention urgently necessary in order to limit the damage. Child monetary poverty is expected to worsen in all regions, with Eastern, Volta and Greater Accra simulated to be the hardest hit, while the primarily rural regions – Northern and Upper West – would be the least affected over the three year period. In confirmation of this result, children living in urban areas would be significantly more affected than those residing in rural areas. As shown in Cockburn, Fofana and Tiberti (2010), the deterioration in child monetary poverty, primarily driven by a reduction in consumer purchasing power and a large drop in income in the non-agriculture sector, is in fact partly offset by the increase in agricultural incomes (both from sales and own-production) following a continuous food price increase.

There is little difference in the impact of the crisis on child poverty by the gender of the household head, though the impact will be slightly more intense for children in female headed households. The negative impact of the economic crisis on the incidence of child poverty among households with 1 to 5 children is quite clear and relatively evenly distributed, while the impact is substantially lower on children living with more than 5 siblings but who already have a much higher probability of being poor. As around 90% of this subgroup of children (who represent 12% of the total child population) live in rural areas, a possible explanation of their lower impacts could be that the households where they live would benefit from the gains present in the agriculture sector as described above.

The poverty gap,⁷ which measures the depth of poverty,⁷ is analyzed in table 10 and tends to support the results found for the poverty headcount, although changes over the BaU and crisis scenarios and over the three years are relatively more evenly distributed. As for the headcount, the poverty gap tends to be higher in the three northern regions – Northern (22.9%), Upper East (30.1%) and Upper West (36.5%) – and far higher than the national average of 11.2%, while the lowest child poverty gap is seen in the Ashanti region. While the poverty gap among male children is higher than among female children that of rural children is higher than among urban children.

In the absence of the crisis, the poverty gap is projected to fall over the period 2009-2011. With the exception of Greater Accra, Volta and Ashanti and Eastern Regions – as, on average, for all urban areas – all the other regions as well as rural areas would have recorded a reduction in the poverty gap among children.

⁶ The official national headcount poverty rate in 1991 was 51.7 per cent, in 1998 39.5 per cent and in 2005/06 28.5 per cent (Ghana Statistical Service 2007).

⁷ Poverty gap ratio (or depth of poverty) is the average amount of money needed to raise all the poor from their consumption level to the poverty line. It is expressed as share of the poverty.

Children living in male-headed households would have achieved higher reductions in the poverty gap as compared to those in female-headed households. Finally, apart from households with a single child, all other households would have recorded a reduction in the poverty gap. With the crisis, Greater Accra and Upper East would be confirmed as the regions most affected in terms of a deterioration in the depth of poverty, and Northern and Upper West would be confirmed as those with the lowest increase in the poverty gap. According to our simulations, however, Volta, which was amongst the regions showing the highest predicted increase of child poverty rate, stays in line with the national value of the poverty gap.

Table 10: Monetary poverty gap in base year, BaU and crisis scenarios by region, sex, locality and number of children in the household

Poverty Gap	Child pop. share (%)	Base year	BaU			Crisis		
			2009	2010	2011	2009	2010	2011
All Children	100	11.2	-0.3	-0.6	-0.9	0.6	2.7	3.3
Western	10.6	10.7	-0.1	-1.1	-2.0	0.9	3.1	3.6
Central	8.7	4.5	-0.5	-0.8	-0.5	0.3	2.1	2.5
Greater Accra	11.2	8.8	0.3	0.3	0.3	1.4	4.0	5.0
Volta	7.6	6.0	0.0	0.2	0.5	0.7	2.7	3.5
Eastern	13.1	4.3	0.3	0.5	0.8	0.6	2.3	3.0
Ashanti	17.6	4.2	-0.3	-0.1	0.1	0.4	2.2	2.9
Brong Ahafo	9.3	11.4	-0.3	-0.6	-1.1	0.7	2.8	3.5
Northern	13.2	22.9	-1.2	-2.4	-4.0	0.0	2.3	2.4
Upper East	4.9	30.1	-0.1	0.0	-1.0	1.1	4.3	5.5
Upper West	3.7	36.5	-1.0	-2.9	-5.4	0.7	2.4	2.5
Rural	65.5	13.3	-0.5	-1.2	-1.9	0.4	2.2	2.6
Urban	34.5	7.1	0.2	0.5	0.8	1.1	3.6	4.8
Female hh head	23.2	7.3	0.0	0.0	0.0	1.0	3.0	3.7
Male hh head	76.8	12.4	-0.4	-0.8	-1.2	0.5	2.6	3.2
1 child	11.6	4.5	0.4	0.5	0.6	0.8	2.3	3.0
2 children	21.6	6.7	0.0	-0.3	-0.2	0.8	2.7	3.4
3 children	24.9	9.1	-0.2	-0.2	-0.2	0.6	2.5	3.1
4 children	18.4	13.1	-0.5	-0.8	-1.0	0.7	3.0	3.7
5 children	11.4	15.1	0.1	-0.3	-0.9	1.0	3.7	4.6
6 children or more	12.1	23.7	-1.6	-2.9	-5.1	-0.1	2.3	2.4

Source : Authors' elaborations using the results of the simulations

Note: Rates for the base year are estimated from the GLSS 5 and reported in their absolute values while those relative to the other scenarios are simulated and expressed as difference in % points to the "base-year" value

4.2.2 Hunger under the baseline and crisis scenarios

Table 11 presents the hunger rates for children in the base year and under the BaU and the crisis scenarios simulated over the 2009-2011 period. Hunger among children for the base year is about 58.5%, which corresponded to slightly less than 5.5 million children. Although this result might be somewhat biased by the relatively poor appropriateness of the price data (as discussed in Section 3), it is in line with the figure reported by Ahmed et al. (2007), which shows a hunger rate for the total population in Ghana in 1998 equal to 56.7%.⁸

⁸ The methodology and the definition of "hunger" followed in Ahmed et al. (2007) are the same as those used in this study. They only differ in the caloric poverty line: The study by Ahmed et al. set the caloric poverty line at 2200 kcal, we fixed it at 2450 kcal. When a caloric poverty line at 2200 kcal is used, we found a headcount hunger rate equal to 52.4%.

As already mentioned above, we believe that the variation in the hunger rate over the period of the analysis and across the different scenarios is able to provide information that is sufficiently useful and robust, even if the levels may be overestimated through the use of official price data.

Disaggregated results by regions indicate that hunger rates for the base year in the three northern regions – Northern (70.1%), Upper West (86.5%) and Upper East (80.7%) – and the Western region (69.3%) are substantially higher than the national average. This regional ranking is fairly in line with what we found for the monetary poverty, although the incidence is substantially higher and a relatively lower inter-regional variation should be noted. This confirms that hunger is more a rural phenomenon, but children living in urban areas and with an insufficient calorie intake should still represent a real preoccupation for the policy maker. As expected, hunger increases with the number of children in a household. Also, children living in male-headed households show a higher hunger rate (60.9%) than those living in female-headed households (50.4%).

Unlike monetary poverty, in the absence of the crisis, hunger would have remained substantially unchanged over the three-year period: this result actually masks some differences within the country. Rural and northern regions (Northern, Upper East and Upper West regions) would have experienced significant decreases by 2011, while the average change in urban areas as well as in the Eastern region would have resulted in a remarkable increase of 3.5 and 5.7 percentage points respectively. These results point to the serious nature of urban poverty, even in the absence of the crisis. Finally, hunger for children living in households with more than 5 children would have reduced significantly, while a slight increase or no change would have been registered for children with fewer siblings.

Table 11: Hunger headcount rates in base year, BaU and crisis scenarios by region, sex, locality and number of children in the household

Headcount	Child pop. share (%)	Base year	BaU			Crisis		
			2009	2010	2011	2009	2010	2011
All Children	100	58.5	0.6	0.4	-0.1	4.2	6.2	6.6
Western	10.6	69.3	-0.3	-0.5	-1.9	4.0	6.1	7.4
Central	8.7	41.5	2.4	3.2	3.6	5.3	7.0	8.0
Greater Accra	11.2	59.0	1.0	0.6	-1.0	6.7	10.0	10.3
Volta	7.6	57.0	-0.3	-2.0	-1.9	2.0	4.0	4.6
Eastern	13.1	42.2	3.4	4.5	5.7	6.6	9.6	11.0
Ashanti	17.6	51.9	2.0	1.8	1.7	5.9	8.3	9.1
Brong Ahafo	9.3	58.6	0.7	1.1	-0.1	4.0	5.9	6.6
Northern	13.2	70.1	-4.3	-5.2	-6.4	0.8	1.2	-0.8
Upper East	4.9	80.7	-0.2	0.0	-1.4	1.0	1.6	1.8
Upper West	3.7	86.5	0.0	-1.0	-2.1	0.5	0.5	0.5
Rural	65.5	61.7	-0.6	-1.1	-1.9	2.4	3.8	3.7
Urban	34.5	51.7	3.0	3.6	3.5	8.0	11.3	12.8
Female hh head	23.2	50.4	2.3	2.7	2.8	5.7	8.2	9.3
Male hh head	76.8	60.9	0.1	-0.2	-1.0	3.8	5.6	5.8
1 child	11.6	38.8	1.3	1.2	0.8	5.1	7.7	8.6
2 children	21.6	49.4	1.7	1.4	1.4	5.2	8.3	9.5
3 children	24.9	55.7	0.8	0.9	0.9	4.8	6.7	7.6
4 children	18.4	64.2	1.3	0.5	0.6	4.4	5.9	6.7
5 children	11.4	67.1	2.2	2.7	1.1	5.3	6.7	7.5
6 children or more	12.1	82.4	-5.3	-5.4	-7.9	-1.0	-0.1	-3.3

Source : Authors' elaborations using the results of the simulations

Note: rates for the base year are estimated from the GLSS 5 and reported in their absolute values while those relative to the other scenarios are simulated and expressed as difference in % points to the "base" value

The global crisis is predicted to severely worsen hunger among children. Child hunger rates are simulated to increase by 4.2, 6.2 and 6.6 percentage points for 2009, 2010 and 2011 (around 620,000 additional children by 2011) respectively, thus reflecting the pattern observed for monetary poverty but with a rapid increase in hunger starting already in 2009. According to our simulations, all regions will experience an increase in child hunger, with the single exception of the Northern region where a slight improvement (-0.8 percentage points) by 2011 is forecast. In order, Eastern, Greater Accra and Volta regions will be the worst affected regions by 2011 while, as for monetary poverty, the rural Northern regions are the least affected. The crisis is expected to dramatically reduce the urban/rural gap in terms of hunger by largely affecting urban areas (in 2011, an increase by 12.8 percentage points, compared to +3.7 in rural areas). Finally, children living in female headed households as well as those living with fewer siblings seem to be relatively more affected by the crisis in terms of their calorie intake. On the contrary, in line with what has already been seen for monetary poverty, children living in households with more than 5 children would largely benefit from the potential gains in the agriculture sector by showing a substantial improvement in terms of their calorie intake (a reduction in hunger rates by 3.3 percentage points by 2011 in comparison with the base year).

From table 12 we learn that the way in which Ghana was pursuing its policies before the crisis would not have led to any reduction in the depth of child hunger: indeed, under the BaU scenario the child poverty gap would have increased by 1.1 percentage points by 2011, starting from a value already worryingly high (23.9%). This denotes that, despite a general increase in the predicted levels of monetary consumption which led to reduction in both the incidence and the gap of monetary poverty, the simulated increase in food prices under the BaU affected the poorest proportionately more than those just below the poverty line. New interventions to cope with the hunger issue need to be implemented, irrespective of the crisis, which has, however, undoubtedly increased the urgency. Again, wide internal differences emerge with the northern rural regions showing the greatest hunger gap: in Upper West it is 50.2% or, in other terms, on average children living in this region would need to double their calorie intakes in order to satisfy their minimum caloric needs (an additional 1230 kcal to reach 2450 kcal a day). However, only these regions would have registered some reduction in the hunger gap in the absence of the crisis and, with the exception of the Upper East region, they are expected to be the least affected by the crisis.

With the crisis, by 2011 the hunger gap in urban areas would deteriorate to such an extent that it would substantially reach the rate predicted for rural areas. Finally, changes and levels of the hunger gap under the different scenarios according to the number of children in the household and the gender of the household head broadly follow the pattern already discussed for the hunger incidence rate.

Table 12: Hunger poverty gaps in base year, BaU and crisis scenarios by region, sex, locality and number of children in the household

Poverty Gap	Child pop. share (%)	Base year	BaU			Crisis		
			2009	2010	2011	2009	2010	2011
All Children	100	23.9	0.7	1.0	1.1	2.5	4.3	5.0
Western	10.6	27.3	0.9	0.8	0.6	2.8	4.5	5.2
Central	8.7	14.1	0.4	0.7	1.3	2.1	3.8	4.5
Greater Accra	11.2	25.3	1.1	1.3	0.9	3.9	6.6	7.5
Volta	7.6	18.2	1.0	1.9	2.6	2.6	4.3	5.3
Eastern	13.1	14.1	1.3	2.1	3.1	2.4	4.2	5.4
Ashanti	17.6	18.5	0.8	1.4	1.7	2.9	5.0	5.8
Brong Ahafo	9.3	19.6	0.8	1.4	1.9	2.4	4.2	5.0
Northern	13.2	35.6	-0.6	-1.1	-2.2	0.8	2.2	2.3
Upper East	4.9	41.6	1.0	1.3	0.5	2.5	4.4	5.3
Upper West	3.7	50.2	0.3	0.0	-1.0	1.2	1.7	2.0
Rural	65.5	25.9	0.3	0.3	0.1	1.7	3.0	3.5
Urban	34.5	19.7	1.5	2.4	3.0	4.1	6.9	8.3
Female hh head	23.2	19.0	1.0	1.5	1.7	3.0	4.9	5.8
Male hh head	76.8	25.4	0.6	0.9	0.8	2.3	4.1	4.8
1 child	11.6	13.5	1.0	1.3	1.5	2.5	4.3	5.2
2 children	21.6	18.2	0.9	1.2	1.5	2.8	4.8	5.7
3 children	24.9	21.9	0.8	1.3	1.4	2.5	4.4	5.1
4 children	18.4	27.3	0.6	0.8	0.9	2.6	4.5	5.2
5 children	11.4	28.9	1.3	1.9	2.0	2.9	4.8	5.9
6 children or more	12.1	38.1	-0.5	-0.6	-1.5	1.0	2.2	2.4

Source: Authors' elaborations using the results of the simulations

Note: Rates for the base year are estimated from the GLSS 5 and reported in their absolute values while those relative to the other scenarios are simulated and expressed as difference in % points to the "base" value

4.2.3 Impact on schooling and child labour under the baseline and crisis scenarios

Table 13 shows the participation rates of children involved in work activities and in school. In the base year, the average estimated school attendance rate for children aged 6-14 is 84.1%. The participation rates for the 6-10 year olds is slightly lower at 82.9%, while that of the 11-14 age group is 85.7%. Disaggregation of the participation rate by gender of the child shows that girls have participation rates 0.5 percentage points higher than boys (82.7%) among the 6-10 age group. However, for the 11-14 age group, boys (86.1%) have a marginally higher participation rate than girls. Children living in urban areas show a higher participation rate than their rural counterparts. This difference is greater for the 6-10 age group (15.5 percentage points), compared to the 11-14 age group (11.5 percentage points).

Higher school participation rates are observed for the coastal regions – Western, Central and Greater Accra as well as Ashanti and Eastern regions in the forest zone (above 89%) – while it is substantially lower in the northern regions, reaching its lowest rate in the Northern region (57% and 58.1% for the 6-10 and 11-14 age groups, respectively). In most regions there is a higher school participation rate for the 11-14 age group compared to the 6-10 year olds with the exception of Ashanti region where a lower rate of 3.2 percentage points is observed. The largest change moving from the 6-10 age group to the 11-14 age group of 10.5 percentage points is observed in Volta region: this might indicate deterioration in school participation over the last years in comparison with the previous years, both coming from higher drop-out rates, postponement of the beginning of school participation or a lower enrolment rate in general.

Turning to child labour rates, the overall participation rate is 34.4%. The age sub-group 6-10 has 11.9 percentage points more involvement compared to the 11-14 age group, which may be driven at least partly by the difference in the definition of “child labour” between the two age groups. Gender disaggregation of the child labour rate also shows that girls have a higher involvement rate than boys in both age sub groups: specifically, 1.6 percentage points for the 6-10 age group increasing to 8.2 percentage points for the 11-14 age group.

The lowest labour participation rates for the younger group are observed in Greater Accra (23.6%). Child labour rates in the remaining nine regions are all above 30% with the Northern and Upper West regions posting labour rates of more than 50% for the 6-10 age group, probably reflecting large involvement of children in the farming and livestock related activities of their households. In comparison with the 6-10 age group, children aged 11 to 14 years old in all the regions except for Upper West posted significantly lower child labour participation rates, varying from a difference of 18.6 percentage points in Western region to 0.9 percentage points in the Northern region.

Table 13: School and labour participation rates for children 6-14 years before the crisis

<i>age sub-group</i>	S/NW	S/W	NS/W	NS/NW	S	W	S/NW	S/W	NS/W	NS/NW	S	W
	<i>Age 6-10</i>						<i>Age 11-14</i>					
Total	54.2	28.7	10.7	6.4	82.9	39.4	68.1	17.6	9.9	4.4	85.7	27.5
Sex												
Female	53.7	29.4	10.8	6.1	83.1	40.2	64.0	21.3	10.3	4.4	85.3	31.6
Male	54.7	28.0	10.6	6.7	82.7	38.6	72.2	13.9	9.5	4.4	86.1	23.4
Area												
Rural	48.1	29.8	14.1	8.0	77.9	43.8	62.1	19.5	13.5	4.87	81.6	33.0
Urban	67.0	26.4	3.5	3.1	93.4	29.9	78.9	14.2	3.4	3.55	93.1	17.6
Region												
Western	60.1	31.5	5.0	3.4	91.6	36.5	79.2	13.4	4.6	2.9	92.6	17.9
Central	57.3	35.1	4.1	3.6	92.3	39.1	71.5	23.5	2.9	2.2	94.9	26.3
Greater	70.5	20.1	3.5	6.0	90.6	23.6	85.6	7.1	2.2	5.2	92.6	9.3
Volta	52.5	23.3	16.2	8.0	75.8	39.5	64.5	21.8	10.8	2.9	86.3	32.6
Eastern	52.5	36.5	6.9	4.2	89.0	43.3	66.3	25.6	6.8	1.3	91.9	32.3
Ashanti	63.2	30.6	5.0	1.2	93.8	35.6	75.2	15.5	6.3	3.1	90.6	21.7
Brong Ahafo	64.1	24.6	7.2	4.1	88.8	31.8	82.0	9.9	6.9	1.3	91.8	16.7
Northern	30.3	26.8	28.5	14.5	57.0	55.3	37.3	20.8	33.5	8.4	58.1	54.3
Upper East	36.3	25.1	18.1	20.5	61.4	43.2	46.5	17.7	16.4	19.4	64.2	34.1
Upper West	37.1	27.8	25.4	9.7	64.9	53.3	34.3	32.9	23.5	9.4	67.2	56.4

Source: Authors’ elaborations using the results of the simulations

Note: S/NW=schooling and not working; S/W=schooling and working; NS/W=not schooling and working; NS/NW=not schooling and not working.

The average schooling rate (S) for children aged 6 to 14 years old is 84.1%, the child labour rate (W) is 34.4%. In detail: S/NW is 60%, S/W is 24.1%, NS/W is 10.3% and NS/NW is 5.6

If we look more carefully at the possible combinations of child activities – schooling and not working (S/NW), schooling and working (S/W), not schooling and working (NS/W), not schooling and not working (NS/NW) – we find out that the situation of younger children is even worse. Among children aged 6 to 10 years old, of those going to school more than a third is also involved in work activities, while this share reduces to a fifth for older children.

The capacity for, and thus the quality of, learning for younger school children is more at risk than for their older counterparts. In the Northern region, where about half of school going children also work, this preoccupation should be of particular relevance. It is also notable that in the Northern region the rate of “idle” children is substantially higher than elsewhere, particular for younger school age children (20.5% in Upper East region). Finally, for the 6-10 age group, no clear differences related to the child’s gender emerge, while amongst the 11-14 years old a substantially larger rate of girls both attend school and work (while the total school rate masked these differences between boys and girls), thus corresponding to a lower rate of girls only going to school.

Table 14 presents simulation of BaU and crisis scenarios for schooling and labour participation among the 6-10 age group. Under BaU, school participation would have improved and resulted in an increase of around 0.5 percentage points in 2011. A similar decrease in the number of working children is not observed, as the increase in school participation is drawn evenly among children previously only going to school and those going to school and working. Opposite figures are predicted for the crisis scenario (i.e. deterioration in schooling and increase in work participation) leading to a potential loss in the number of 6-10 year old school going children of up to 0.7% (school participation in 2011 under BaU versus under crisis, corresponding to around 9000 children). As for older children (table 15), the pattern of results is similar to those for younger children, although the variations are smaller. The only notable exception is related to working children as the variation in those combining with school is predicted to prevail (both under the BaU and the crisis) in comparison with those predicted as only working. The result is a total increase (under the BaU) and reduction (under the crisis) in the number of working children.

Table 14: School and labour participation for 6-10 age group

	<u>school/no work</u>	<u>school/work</u>	<u>no school/work</u>	<u>no school/no work</u>	<u>school</u>	<u>work</u>
Base year (estimated)	54.209	28.679	10.685	6.425	82.888	39.364
BaU 2009	0.036	0.038	-0.044	-0.029	0.073	-0.006
BaU 2010	0.115	0.106	-0.131	-0.090	0.221	-0.025
BaU 2011	0.232	0.200	-0.262	-0.170	0.432	-0.062
Crisis 2009	-0.045	-0.030	0.039	0.037	-0.076	0.008
Crisis 2010	-0.161	-0.132	0.157	0.137	-0.294	0.025
Crisis 2011	-0.175	-0.141	0.166	0.150	-0.316	0.025

Source: Authors’ elaborations using the results of the simulations

Note: Estimated rates for the base year are reported in % while values relative to the other scenarios are expressed as % point difference of the simulated values relative to the estimated "base" value

Table 15: School and labour participation for 11-14 age group

	<u>school/no work</u>	<u>school/work</u>	<u>no school/work</u>	<u>no school/no work</u>	<u>school</u>	<u>work</u>
Base year (estimated)	68.147	17.571	9.880	4.400	85.718	27.451
BaU 2009	0.007	0.027	-0.019	-0.015	0.035	0.008
BaU 2010	0.021	0.088	-0.060	-0.050	0.110	0.028
BaU 2011	0.043	0.180	-0.123	-0.100	0.223	0.057
Crisis 2009	-0.008	-0.034	0.019	0.022	-0.041	-0.014
Crisis 2010	-0.029	-0.114	0.070	0.074	-0.144	-0.044
Crisis 2011	-0.032	-0.123	0.075	0.080	-0.155	-0.049

Source: Authors’ elaborations using the results of the simulations

Note: Estimated rates for the base year are reported in % while values relative to the other scenarios are expressed as % point difference of the simulated values relative to the estimated "base" value

4.2.4 Access to health care under the baseline and crisis scenarios

Table 16 shows the distribution of whether children who reported any sickness consulted a health facility and the type of health facility consulted for the base year. The table shows that 61% of sick children (around 1 million children) consulted a health facility. The distribution across the health facilities is hospitals (29.9%), clinics (32.5%), pharmacy (32.1%) and other⁹ (5.6%). The gender of the child did not seem to influence the decision to consult a health facility and the type of health facility consulted as roughly similar rates are observed for both sexes. The children in urban areas (68.4%) are more likely to consult a health facility compared to children living in the rural areas (57.7%). Specifically, consultations in hospitals are frequently used most in urban areas while almost no children are visited by practitioners offering a lower quality service. In rural areas clinics are the first place where sick children consult (36.1%), closely followed by pharmacies (33.2%). In general, self-care, despite its long-term negative effects, is adopted by more than a third of sick children. Large differences across the regions also clearly emerge.

Table 16: Consultation rates and type of health facility consulted at the base year for children who were ill (in percentages)

	Health consultation among all sick children	Type of health facility consulted among sick children who asked for health			
		Hospital	Clinic	Pharmacy	Other
Total	61.0	29.9	32.5	32.1	5.5
Sex					
Female	61.5	28.2	34.4	32.4	5.0
Male	60.6	31.5	30.6	31.8	6.1
Area					
Rural	57.7	23.1	36.1	33.2	7.5
Urban	68.4	42.4	25.7	30.0	1.9
Region					
Western	75.5	21.9	36.7	39.7	1.8
Central	47.6	54.1	22.6	14.4	8.9
Greater Accra	60.0	38.4	40.5	18.9	2.2
Volta	49.6	16.4	38.3	27.3	18.0
Eastern	53.8	36.3	37.7	24.3	1.6
Ashanti	69.8	33.9	18.7	44.8	2.6
Brong Ahafo	64.0	25.5	42.7	27.4	4.4
Northern	61.7	23.5	28.3	38.2	10.0
Upper East	58.3	34.2	35.8	23.3	6.8
Upper West	50.5	19.1	63.1	8.0	9.8

Source: Authors' elaborations using the results of the simulations

According to our simulations (table 17), without the crisis an improvement in consultation compared to the baseline would have been possible. More specifically, households are shown to increasingly send their children to hospitals and clinics and reduce their consultation of pharmacies and other categories of lower quality health service providers. In contrast, with simulation of the crisis, a reversal is observed. We predict a decline in health consultation of nearly 1 percentage point (equivalent to around 6000 children) together with a drop in visits to hospitals and clinics and these are again due to the drop in income and the increasing difficulty that households are likely to face in meeting health costs. Pharmacies and other options become more popular and an increase in their consultation is forecast.

⁹ These include the consultant's home or categories of health facilities outside the officially provided facilities such as traditional healers including herbalists, medicine men, *wanzams*, *juju men* etc.

The substantial diversion towards self-care is thus adopted as a coping mechanism by households during a period of crisis, while the use of traditional healers is basically unchanged in comparison with the base year.

Table 17: Simulation of health consultations

	Health consultation among all sick children	Type of health facility consulted among sick children who asked for health consultation			
		Hospital	Clinic	Pharmacy	Other
Base year (estimated)	61.034	29.908	32.462	32.083	5.546
BaU 2009	0.021	0.014	0.071	-0.077	-0.008
BaU 2010	0.133	0.102	0.244	-0.314	-0.032
BaU 2011	0.241	0.210	0.538	-0.677	-0.071
Crisis 2009	-0.172	-0.194	-0.098	0.277	0.015
Crisis 2010	-0.493	-0.524	-0.283	0.766	0.041
Crisis 2011	-0.563	-0.599	-0.296	0.852	0.043

Source: Authors' elaborations using the results of the simulations

Note: Estimated rates for the base year are reported in % while values relative to the other scenarios are expressed as % point difference of the simulated values relative to the estimated "base" value

4.3 Simulations of alternative policy responses

Our analysis shows that initial conditions and the magnitude of the impact of the global economic crisis on the transmission variables determine the macro and micro impacts on Ghana's economy. Although the world economy is stabilizing, our analysis shows that Ghana's economy and children's well-being are more affected during this phase than the crisis period itself. This is mainly due to the (observed) early rebound of world import prices while the other transmission variables (export volumes, foreign inflows), which have a positive impact on the Ghanaian economy, remain depressed. Therefore, the design and implementation of appropriate economic policies in response to the global crisis will considerably contribute to reducing its welfare cost, in particular for children.

When government faces a tight budgetary constraint, a reduction in government current and investment spending and/or an increase in taxes are policies that can be undertaken to balance its budget. This is known as a pro-cyclical fiscal policy response. On the other hand, a counter-cyclical fiscal policy response would be to increase government spending on public services and/or cut domestic taxes.

However, the Government in Ghana has been running a fiscal deficit over recent years and, consequently, is not in a position to engage in counter-cyclical policy responses. Indeed, as the fiscal deficit deepens in the face of the global crisis, it may even have to turn to pro-cyclical policies that aim to reduce public spending and increase tax revenues, which will increase the short-term vulnerability of the national economy and further exacerbate the effects of the crisis. The impact of tax increases would depend on their nature, income taxes being, for example, generally progressive, whereas sales taxes are often regressive. Spending cuts would tend to hit poor households disproportionately, to the extent that they reduce the supply of public services.

This study quantifies the impact of two counter-cyclical stimulus programmes entirely financed from external sources (international aid) aiming to protect children from the negative effects of the global economic crisis:

- **Consumption oriented fiscal stimulus:** consumption tax cuts (VAT or tariff) on food products (Response 1).
- **Targeted cash/in-kind transfers** to poor children aged 0 to 14 years who are identified using a proxy-means test approach (Response 2). The estimated individual annual amount is 19.8 *Cedis*. The effectiveness of this policy is compared to that of a universal transfer programme to all children younger than 6.

The total budget for each programme is arbitrary fixed at 1% of the 2008 national GDP.

We also simulated additional domestically-funded policy responses for Ghana that were proposed and discussed with local committees. Specifically, they consist of targeted cash transfers financed through a 20% increase in tariffs on rice imports and an endogenous increase in tariffs on non-food manufacturing goods imports (Response 3). Alternatively, an endogenous increase in the property tax is also explored to finance the cash/in-kind transfer programme (Response 4). The two financing mechanisms are both constructed in a way that the government is able to raise an amount equivalent to 0.5% of GDP in base-year terms and the estimated individual annual amount is 10 *Cedis*.

The total budget amount allocated for these policies does not take into account the administrative costs needed to put them in place.

The proposed stimulus packages have little in terms of macroeconomic effects (tables in Annex III). Consequently our analysis in the next section focuses solely on the effects on child welfare.

Before analyzing the effectiveness of each policy response proposed in this study, it is worth discussing the performance of the targeting model we have adopted to identify poor children for cash transfers. It is to some extent inevitable that errors will occur in accurately targeting poor households, based on easily observable characteristics, and this will affect policy effectiveness. Thus, households that are not below the poverty line might receive some transfers that are intended for poor households while some poor households might not receive transfers. The proposed model of targeting is able to correctly identify as poor around 80% of actual poor children (actual status for survey households can be assessed from income-expenditure data), while the other 20% are incorrectly identified as non-poor and thus excluded. A further 37% of children identified as non-poor are wrongly identified as poor using our model (see Annex II, table B).

4.3.1 Monetary poverty under different policy responses

Table 18 presents results of the simulation of the four policy responses. As discussed earlier, in the absence of the global financial crisis Ghana would have experienced a reduction in

monetary poverty among children of about 0.9, 1.9 and 4.1 percentage points for 2009, 2010 and 2011, respectively, compared to the base year. But with the global economic crisis, the incidence of monetary poverty among children is expected to worsen over the period 2009-2011 and some interventions to counteract it must be taken soon.

Providing price subsidies for food products prices (Response 1) would slightly diminish the effect of the crisis in terms of child monetary poverty, by reducing the incidence by around 1 percentage point in comparison with the results under the crisis.

With the same budget (1% of GDP in 2008 terms, again financed through external aid), a cash transfer to poor children (as predicted by the proxy-means model) is simulated to produce better outcomes in terms of the reduction of child monetary poverty after the crisis. Specifically, in 2009 this response would be able to bring the monetary poverty rate below base-year levels, while in the two following years – as the crisis has an increasing impact – the transfer would be able only to partly offset the effects of the crisis but would still cut the predicted increase in monetary poverty by a third – over 2 percentage points (around 200,000 children) – in 2011.

When the amount of the total budget is halved to 0.5% of GDP in 2008 terms and financed from domestic sources, whether this is through taxes on specific imports or property taxation, cash transfers have similar effects, as poverty increases by almost the same margins in 2009, 2010 and 2011. These are very similar results to those obtained under the food price subsidy policy (with a budget twice as large at 1% of GDP).

Table 18: Results of simulations of policy options on monetary poverty headcount

Scenarios	Monetary poverty headcount (%)	Difference to the base year, percentage points	Difference to the crisis (relevant year), percentage points
Base year (estimated)	33.7		
Crisis 2009	35.2	1.5	
Crisis 2010	39.8	6.1	
Crisis 2011	40.4	6.6	
Resp 1 Food Subsidy 2009 (1% GDP)	34.3	0.6	-0.9
Resp 1 Food Subsidy 2010 (1% GDP)	38.6	4.9	-1.2
Resp 1 Food Subsidy 2011 (1% GDP)	39.6	5.9	-0.8
Resp 2 Cash Transfer 2009 (1% GDP)	33.3	-0.4	-1.9
Resp 2 Cash Transfer 2010 (1% GDP)	37.4	3.7	-2.4
Resp 2 Cash Transfer 2011 (1% GDP)	38.2	4.5	-2.2
Resp 3 Cash Transfer 2009+ImportTax (0.5% GDP)	34.4	0.7	-0.8
Resp 3 Cash Transfer 2010+ImportTax (0.5% GDP)	38.8	5.1	-1.0
Resp 3 Cash Transfer 2011+ImportTax (0.5% GDP)	39.5	5.8	-0.9
Resp 4 Cash Transfer 2009+PropertyTax (0.5% GDP)	34.5	0.8	-0.7
Resp 4 Cash Transfer 2010+PropertyTax (0.5% GDP)	38.9	5.2	-0.9
Resp 4 Cash Transfer 2011+PropertyTax (0.5% GDP)	39.6	5.9	-0.8

Source: Authors' elaborations using the results of the simulations

Finally, table 19 compares results for monetary poverty of the targeted cash transfer discussed above (Response 2) to those of a universal cash transfer.

The two programmes allocate the same total budget – 1% of GDP – but the universal programme is applied only to children aged 0 to 5 years old. As for the targeted programme, we assume that transfers to all children in the household are pooled with other household income and shared equitably among all household members. As the total population of children aged 0 to 5 is smaller than the population of children aged 0 to 14 that are predicted to be poor (and thus targeted), the annual amount – in the survey’s year terms – transferred to each individual child would thus be larger under the targeted programme: 30.6 new *Cedis* in Ghana. When the entire child population is considered, providing a universal cash transfer to all children aged 0 to 5 years is very effective in reducing monetary poverty rates after the crisis. Results are very close to those simulated for a targeted cash transfer to all children predicted as poor. This good performance is the result of a combination of a higher individual transfer and of the elimination of the undercoverage errors from the targeting approach.

Specifically, under the universal approach, monetary poverty rates are only 0 to +0.1 points higher with the universal cash transfer (for all children 0-5 years old) compared with the targeted approach (for poor children 0-14 years old). Moreover, if we consider only children aged 0 to 5 years old, who we may argue are the most vulnerable to the impacts of the crisis, then the universal approach is predicted to produce better performances in terms of monetary poverty than the targeted approach. In particular, their monetary poverty rates would be up to 1 percentage point lower when a universal transfer is implemented.

Finally, universal targeting is relatively easier to carry out and, at least in a first phase, may represent a more cost-effective alternative, particularly where some wealthier households self-exclude themselves by deeming the amount of the transfer too small to collect, which would reduce leakage rates and the overall cost of the policy.

Table 19: Child monetary poverty rates under targeted and universal transfer (in %), by different age groups

	0-14 years old			0-5 years old		
	crisis	TT 0-14	UT 0-5	crisis	TT 0-14	UT 0-5
Ghana	<i>base-year poverty rate: 33.7%</i>			<i>base-year poverty rate: 31.3%</i>		
2009	35.2	33.3	33.4	32.6	30.7	30.0
2010	39.8	37.4	37.4	37.4	34.9	33.9
2011	40.4	38.2	38.2	37.7	35.7	34.9

Source: Authors’ elaborations using the results of the simulations

Notes: “TT 0-14” is for targeted cash transfer to all (predicted) poor children aged 0 to 14 years old;

“UT 0-5” is for universal transfer for all children aged 0 to 5 years old

4.3.2 Hunger under different policy responses

As shown in table 20, none of the policies simulated could restore hunger rates to base-year levels. Unlike monetary poverty, food subsidies have very similar effects on hunger to those obtained through aid-financed targeted cash transfers, marginally decreasing the negative effects of the crisis. The impact of cash transfers and food subsidies is simulated to be a reduction of 1.4 percentage points in 2009 and less than one percentage point in 2011, that is around 80,000 fewer children suffering from hunger in 2011.

Hunger is so deeply rooted that different and structural interventions would be required to really change the status of children. Domestically-financed targeted cash transfers, with half the overall budget, only reduce hunger rates by a few percentage points in comparison to the crisis scenario.

Table 20: Results of simulations of policy options on hunger

Scenarios	Hunger rate (%)	Difference to the base year, percentage points	Difference to the crisis (relevant year), percentage points
Base year (estimated)	58.5		
Crisis 2009	62.7	4.2	
Crisis 2010	64.7	6.2	
Crisis 2011	65.1	6.6	
Resp 1 Food Subsidy 2009 (1% GDP)	61.3	2.8	-1.4
Resp 1 Food Subsidy 2010 (1% GDP)	63.4	4.9	-1.3
Resp 1 Food Subsidy 2011 (1% GDP)	64.2	5.7	-0.9
Resp 2 Cash Transfer 2009 (1% GDP)	61.3	2.8	-1.4
Resp 2 Cash Transfer 2010 (1% GDP)	63.4	4.9	-1.3
Resp 2 Cash Transfer 2011 (1% GDP)	64.3	5.8	-0.8
Resp 3 Cash Transfer 2009+ImportTax (0.5% GDP)	62.0	3.5	-0.7
Resp 3 Cash Transfer 2010+ImportTax (0.5% GDP)	64.6	6.1	-0.1
Resp 3 Cash Transfer 2011+ImportTax (0.5% GDP)	64.8	6.3	-0.3
Resp 4 Cash Transfer 2009+PropertyTax (0.5% GDP)	61.8	3.3	-0.9
Resp 4 Cash Transfer 2010+PropertyTax (0.5% GDP)	64.4	5.9	-0.3
Resp 4 Cash Transfer 2011+PropertyTax (0.5% GDP)	64.7	6.2	-0.4

Source: Authors' elaborations using the results of the simulations

4.3.3 Child schooling and labour under different policy responses

Table 21 presents the results of the different policy responses on school and labour participation for the 6-10 age group. A cursory glance at the table indicates that all the policies simulated would lead to a modest increase in schooling in comparison with the crisis values but would not be able to bring school participation rates back to base-year values, with the exception of the aid-financed cash transfer programme (Response 2) in 2009. On average, changes in work participation in comparison with the base year are small, as increases in the percentage of children combining work and school almost exactly offset reductions in the percentage of children who work without attending school. As changes in child schooling and work are only affected through changes in real consumption, the three cash transfer policies perform better than the food price subsidy. Of course, the aid-financed cash transfer with a budget of 1% of GDP has a greater impact. Although 1% of GDP in cash transfers represents a significant investment, it is insufficient to offset crisis impacts on work and school decisions. Some complementary interventions on the supply side may be required, although this is beyond the scope of our analysis.

Table 21: Simulation of policy responses on education for children aged 6-10

	S/NW	S/W	NS/W	NS/NW	school	work
Base year (estimated)	54.209	28.679	10.685	6.425	82.888	39.364
Crisis 2009	-0.045	-0.030	0.039	0.037	-0.076	0.008
Crisis 2010	-0.161	-0.132	0.157	0.137	-0.294	0.025
Crisis 2011	-0.175	-0.141	0.166	0.150	-0.316	0.025
Food Subsidy 2009 (1% GDP)	-0.016	-0.004	0.008	0.012	-0.020	0.004
Food Subsidy 2010 (1% GDP)	-0.134	-0.105	0.126	0.112	-0.239	0.021
Food Subsidy 2011 (1% GDP)	-0.148	-0.116	0.138	0.126	-0.264	0.022
Cash Transfer 2009 (1% GDP)	0.023	0.048	-0.040	-0.032	0.072	0.008
Cash Transfer 2010 (1% GDP)	-0.095	-0.055	0.080	0.070	-0.149	0.025
Cash Transfer 2011 (1% GDP)	-0.109	-0.066	0.091	0.084	-0.175	0.026
Cash Transfer 2009+ImportTax (0.5% GDP)	-0.015	0.005	0.003	0.006	-0.010	0.009
Cash Transfer 2010+ImportTax (0.5% GDP)	-0.131	-0.096	0.121	0.105	-0.226	0.025
Cash Transfer 2011+ImportTax (0.5% GDP)	-0.144	-0.106	0.131	0.119	-0.250	0.026
Cash Transfer 2009+PropertyTax (0.5% GDP)	-0.016	0.005	0.004	0.007	-0.011	0.009
Cash Transfer 2010+PropertyTax (0.5% GDP)	-0.132	-0.097	0.123	0.107	-0.230	0.025
Cash Transfer 2011+PropertyTax (0.5% GDP)	-0.146	-0.107	0.133	0.120	-0.253	0.026

Source: Authors' elaborations using the results of the simulations

Note: S/NW=school and not work; S/W=school and work; NS/W=not school and work, NS/NW=not school and not work.

Estimated rates for the base year are reported in % while values relative to the other scenarios are expressed as % point difference of the simulated values relative to the estimated "base" value

Finally, although to a smaller extent, changes for each of the four different policy scenarios are similar for children aged 11 to 14 years old (table 22) to those discussed above for younger children. These confirm that targeted cash transfers are more effective in increasing school participation than are food subsidies.

Table 22: Simulation of policy responses on education for children aged 11-14 years

	S/NW	S/W	NS/W	NS/NW	school	work
Base year (estimated)	68.147	17.571	9.880	4.400	85.718	27.451
Crisis 2009	-0.008	-0.034	0.019	0.022	-0.041	-0.014
Crisis 2010	-0.029	-0.114	0.070	0.074	-0.144	-0.044
Crisis 2011	-0.032	-0.123	0.075	0.080	-0.155	-0.049
Food Subsidy 2009 (1% GDP)	-0.002	-0.013	0.006	0.009	-0.015	-0.007
Food Subsidy 2010 (1% GDP)	-0.024	-0.095	0.057	0.061	-0.118	-0.037
Food Subsidy 2011 (1% GDP)	-0.027	-0.104	0.062	0.069	-0.131	-0.042
Cash Transfer 2009 (1% GDP)	0.009	0.007	-0.009	-0.007	0.016	-0.002
Cash Transfer 2010 (1% GDP)	-0.013	-0.076	0.043	0.046	-0.088	-0.033
Cash Transfer 2011 (1% GDP)	-0.016	-0.085	0.048	0.053	-0.101	-0.038
Cash Transfer 2009+ImportTax (0.5% GDP)	-0.000	-0.016	0.007	0.010	-0.017	-0.009
Cash Transfer 2010+ImportTax (0.5% GDP)	-0.022	-0.097	0.058	0.061	-0.119	-0.039
Cash Transfer 2011+ImportTax (0.5% GDP)	-0.024	-0.106	0.062	0.068	-0.130	-0.044
Cash Transfer 2009+PropertyTax (0.5% GDP)	-0.000	-0.017	0.007	0.010	-0.017	-0.010
Cash Transfer 2010+PropertyTax (0.5% GDP)	-0.022	-0.098	0.058	0.062	-0.120	-0.040
Cash Transfer 2011+PropertyTax (0.5% GDP)	-0.025	-0.107	0.063	0.069	-0.132	-0.044

Source: Authors' elaborations using the results of the simulations

Note: S/NW=school and not work; S/W=school and work; NS/W=not school and work, NS/NW=not school and not work.

Estimated rates for the base year are reported in % while values relative to the other scenarios are expressed as % point difference of the simulated values relative to the estimated "base" value

4.3.4 Access to health care for children under different policy responses

The same policy responses are also simulated for their access on health care and the results are presented in table 23. Generally, all the policy responses simulated lead to some improvements in health access for ill children in comparison with the crisis scenario, but these are not large enough to return to base-year levels. In terms of cost effectiveness, allocating 1% of GDP to a targeted cash transfer produces marginally better outcomes than increasing real incomes by subsidizing food prices. While the crisis is simulated to decrease the percentage of sick children consulting any health facility by up to 0.56 percentage points in 2011, the cash transfer programme would only be able to increase this by around 0.1 percentage points in 2011.

The domestically-financed cash transfer programmes, with a budget of only 0.5% of GDP, have slightly less than half the impact, regardless of the domestic tax source, as the tax increases lower real incomes whereas foreign aid does not.

It is interesting to note that none of the policy responses simulated have a substantial effect on the choice of health facility. However they slightly counteract the substitution away from higher quality services.

Table 23: Simulating policy responses on access to health care for sick children (0-14 years old)

	Health consultation among all sick children	Type health facility consulted among sick children who asked for health consultation			
		Hospital	Clinic	Pharmacy	Other
Base year (estimated)	61.034	29.908	32.462	32.083	5.546
Crisis 2009	-0.172	-0.194	-0.098	0.277	0.015
Crisis 2010	-0.493	-0.524	-0.283	0.766	0.041
Crisis 2011	-0.563	-0.599	-0.296	0.852	0.043
Food Subsidy 2009 (1% GDP)	-0.102	-0.126	-0.049	0.168	0.008
Food Subsidy 2010 (1% GDP)	-0.423	-0.457	-0.242	0.664	0.035
Food Subsidy 2011 (1% GDP)	-0.497	-0.535	-0.257	0.755	0.037
Cash Transfer 2009 (1% GDP)	-0.079	-0.119	-0.066	0.176	0.009
Cash Transfer 2010 (1% GDP)	-0.401	-0.450	-0.256	0.670	0.035
Cash Transfer 2011 (1% GDP)	-0.473	-0.527	-0.270	0.759	0.038
Cash Transfer 2009+ImportTax (0.5% GDP)	-0.138	-0.169	-0.090	0.246	0.013
Cash Transfer 2010+ImportTax (0.5% GDP)	-0.456	-0.495	-0.274	0.731	0.039
Cash Transfer 2011+ImportTax (0.5% GDP)	-0.526	-0.570	-0.287	0.817	0.041
Cash Transfer 2009+PropertyTax (0.5% GDP)	-0.137	-0.168	-0.091	0.246	0.013
Cash Transfer 2010+PropertyTax (0.5% GDP)	-0.458	-0.497	-0.276	0.735	0.039
Cash Transfer 2011+PropertyTax (0.5% GDP)	-0.529	-0.573	-0.290	0.821	0.041

Source: Authors' elaborations using the results of the simulations

Note: Estimated rates for the base year are reported in % while values relative to the other scenarios are expressed as % point difference of the simulated values relative to the estimated "base" value

4. CONCLUSION

In summary, the global crisis at the macro level is resulting in many shocks to the Ghanaian economy through fluctuating import prices, falling export demand, as well as reduced inflows of FDI, foreign aid and remittances. Simulations based on a computable general equilibrium (CGE) model suggest that these shocks lead to a significant slowdown in economic growth, especially in 2010 (3.8%, as opposed to 7.0% forecast in the absence of the crisis). Workers are pushed into the informal market where wage rates fall. At the same time, an early (2010) rebound in import prices and a forecast depreciation of the real exchange rate, contribute to a marked increase in consumer prices, whereas growth and employment levels only begin to recover in 2011. All these factors combine to significantly reduce household real incomes with negative effects on vulnerable members such as children.

Before the crisis, in 2008, monetary poverty and hunger rates among children in Ghana were about 35 and 60%, respectively, with significant regional disparities particularly in terms of monetary poverty. Poverty and hunger rates are especially high in rural households and households with many children.

When the wage, employment and price variations from our macro simulations are fed into micro (household- and individual-level) simulations, we predict that both monetary poverty and hunger would have reduced across all regions in Ghana from 2009 to 2011 without the financial crisis. Particularly strong reductions are forecast for rural areas – indeed, monetary poverty and hunger actually slightly increase in urban areas – and in households with many children.

Results from the simulations indicate that the global crisis would increase monetary poverty and hunger across all regions, eroding many of the gains made over the past few years. Indeed, instead of a reduction of 4 percentage points in child monetary poverty in 2011, predicted in the absence of crisis, our simulations indicate a 6.6 percentage point increase compared with the year preceding the crisis, with a continuous increasing pattern over the period of study. The global crisis is also predicted to severely deepen hunger among children, which is simulated to increase up to 6.6 percentage points in 2011, beginning with a sharp already in 2009. For both monetary poverty and hunger large inter-regional variations emerge with the Eastern, Volta and Greater Accra regions predicted to be the most affected. Households with few children and in urban areas are more severely affected, possibly because rural households and households with more children are more likely to be subsistence farmers and thus more insulated from market shocks. Similar trends are noted when the analysis is in terms of gaps rather than the incidence of poverty and hunger. Finally, the increase in child monetary poverty, primarily driven by a reduction in consumer purchasing power and a large drop in income in the non-agriculture sector, is partly offset by the increase in agricultural incomes (from the value of both sales and own-production) resulting from a continuous increase in food prices. Participation in schooling and involvement in labour activities, as well as access to health services, among children are forecast to be much less affected by the crisis, although it is found to reverse predicted increases in enrolment and health access (with substitution toward more modern types of health services) as well as predicted reductions in child labour.

In summary, our analysis of alternative policy responses suggests that they significantly reduce monetary poverty and hunger, yet have much more modest impacts on schooling, labour and health access among children. This is due to the fact that cash transfers and food subsidies translate directly into increased real income and food consumption. Indeed, on average 57% of the expenditure of Ghanaians is on food. In contrast, real income is only one determinant of child labour, schooling and health access decisions. Supply-side policies (for example, investment in school infrastructures – namely, improving the quality of existing facilities and/or the construction of new facilities) may be much more effective here. In fact, over the past 2-3 years the government of Ghana has started to implement or design various health and education policies such as a school feeding programme, a capitation grant, health insurance, free maternal care and direct transfers to households. These have to some extent influenced social protection in the country especially in the area of health and education.

This study simulated the effectiveness of 4 policy responses: (1) food price subsidies and (2) targeted cash transfer for poor children, both with a total budget of 1% of GDP in 2008 terms and financed through external aid; targeted cash transfer for poor children using a total budget of 0.5% of GDP in 2008 terms domestically funded through (3) a 20% increase in tariffs on rice imports and an endogenous increase in tariffs on non-food manufacturing goods imports and (4) an endogenous increase in the property tax is also explored to finance the cash/in-kind transfer programme.

A cash transfer programme targeted to poor children is found to be generally more effective in protecting children than food subsidies. Indeed, with a total budget equivalent to 1% of 2008 GDP (Response 2), a cash transfer – equivalent to an individual annual amount of 19.8 *Cedis* – would cut the predicted increase in monetary poverty by a third, over two percentage points, in 2011 or equivalent to around 200 thousand children.

The impact of cash transfer on the hunger rate is smaller, at less than one percentage point (that is around 80 thousand children less than under the crisis without any policy intervention), and is similar to those obtained with food subsidies: hunger is so deeply rooted that different and structural interventions would be required to truly improve the status of children.

The four policies simulated generally cut the decline in schooling and increase in child labour resulting from the crisis, although not enough to totally offset them. In the same way, they slightly reduce the crisis-generated fall in health consultations and the substitution toward less modern types of health services.

As the domestically funded policy responses – through taxes on specific imports or property taxation – do not have significant implications at the macro level, similar outcomes to those financed through external aid are predicted and the differences are mainly due to differences in the magnitude of the budget allocated to the policy (0.5% of GDP for the domestically funded policy, 1% of GDP for the externally financed policy).

Finally, although Ghana might be in a position to implement in a relatively short time a cash transfer programme to respond to the crisis by building on the existing Livelihood Empowerment against Poverty (LEAP) programme, other interventions (or mix of policies) might be more cost-effective in the short run. A combination of a universal or regionally targeted (starting with those regions where child poverty is more widespread) cash transfer programme for children aged 0 to 5 years old, together with a school-feeding programme in poorer regions, might represent an effective way to intervene quickly to improve child well-being. With the same overall budget, a cash transfer provided universally to all children aged 0 to 5 is estimated to lead to child monetary poverty rates that are substantially similar to the case in which a cash transfer is targeted to all children (0 to 14 years old) predicted as poor, while actually improving the situation of younger children. This result is basically due to the higher individual amount transferred under a universal approach (30.6 vs 19.8 *Cedis*) and the universal coverage of poor children. Under a targeted scheme, undercoverage always occurs to some extent, as children are identified as poor solely on the basis of a small number of observable characteristics that are linked to household consumption.

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Annex I

Table A: Commodity categories

Commodity categories	Commodities
1 Cereals	biscuits, millet, flour (wheat), bread-sugar bread, other cereals
2 Maize	maize, ground/corn dough, kenkey/banku (without sauce)
3 Tubers	cassava, cocoyam, other starchy staples
4 Plantain	plantain
5 Meat	beef, pork, bush meat/wild game, goat meat, corned beef, other meat (dog, cat, etc.), mutton
6 Poultry	poultry, chicken, other domestic
7 Fruit	water melon, banana, orange/tangerine, coconut, other fruits not canned
8 Vegetables	garden eggs, tomato puree (canned), cocoyam leaves (kontomire), okro, onions (large/small), tomatoes (fresh), other vegetables
9 Fish	fish (smoked), fish (fried), fish (dried), fish (fresh and frozen), crustaceans (snails, lobsters, crabs, prawns), fish (canned) other fish
10 Pulses and Nuts	groundnuts (roasted or raw), palm nuts, beans, other pulses and nuts
11 Milk and milk products	sugar (cube, granulated), tinned milk (unsweetened, evaporated), milk (powdered), other milk products including cheese, other confectioneries
12 Oils	palm oil, groundnut oil, sheaf butter, coconut oil, palm kernel oil, other vegetable oils including animal fats
13 Rice	rice-imported, rice-local
14 Eggs	chicken eggs other eggs
15 Beverages	soft drinks and minerals, palm wine/raffia palm wine etc, Guinness & other stout, whiskies and gins, other beverage drinks, akpeteshie, beer (local), fruit juices, other local wine, other spirits

Annex II

Table A: Results of the "proxy-means" regression to identify poor individuals in Ghana

	Urban	Rural
Regions		
Western	0.000	0.000
Central	0.350 ***	0.363 ***
Greater Accra	-0.066 *	0.000 ***
Volta	0.301 ***	0.086 ***
Eastern	0.188 ***	0.338 ***
Astanti	0.345 ***	0.358 ***
Brong Ahafo	0.305 ***	0.000
Northern	0.000	-0.300 ***
Upper East	0.000	-0.527 ***
Upper West	-0.469 ***	-0.572 ***
hh_ageabove14	-0.116 ***	-0.040 ***
hh_agebelow15	-0.064 ***	-0.050 ***
hh_size_2	0.000	0.000
hh_size_3	-0.147 ***	0.000
hh_size_4	-0.140 ***	0.000
hh_size_5	-0.239 ***	0.000
hh_size_6	-0.184 ***	0.000
Education_hh_head	-0.256 ***	-0.129 ***
Wall	0.207 ***	0.061 **
Roof	0.000	-0.069 ***
Electricity	0.558 ***	0.049 **
Water	0.000	0.332 ***
Kerosene	0.311 ***	0.000
n_rooms	0.252 ***	0.585 ***
Automobile	0.677 ***	0.000
Moto	0.000	0.568 ***
Constant	15.113 ***	15.148 ***
"cut-off point"	12.504	12.504

Source: Authors' elaboration from GLSS 2005/06

Notes:

- Dependent variable: logarithm of total household expenditure (per adult equivalent) divided by the relevant regional price deflator
- Econometric model: quantile regressions set at 0.174 for urban areas and at 0.30 for rural areas
- Coefficients significant at 1% (***), 5% (**), 10% (*) level
- Pseudo R² for "urban" 0.24; for "rural" 0.24
- The "cut-off point" is in log form and corresponds to 3708900 old Ghana *cedis*, the 2005/6 poverty line
- To identify the poor, it is sufficient to multiply the variables for each household by their respective coefficients. If the total sum is less than 15.126 the household is considered as poor.
- In order to apply these estimated coefficients in the new monetary regime using the new Ghana *cedis*, it is sufficient to divide the poverty line by 10'000 to arrive at the new cut-off point in log terms (= 5.916)

Key:

Regions = binary variables for each region taking label "Western" (the comparison category) to "Upper West"

hh_ageabove14 = number of household members aged 15 and over

hh_agebelow15 = number of household members aged 14 and under

hh_size = binary variables for number of household members. "hh_size_6" is for 6 or more

education_hh_head = binary variable equal to 1 if household head had no education or only MSLC (urban)

wall = binary variable equal to 1 if household lives in a house with a cement or sandcrete walls; 0 otherwise

roof = binary variable equal to 1 if household lives in a house with a roof in leaves; 0 otherwise

electricity = binary equal to 1 if household lives in a house with electricity; 0 otherwise

water = binary equal to 1 if household has access to own source of water; 0 otherwise

kerosene = binary equal to 1 if household uses kerosene as main source of lighting; 0 otherwise

n_rooms = number of rooms per household member

automobile = binary equal to 1 if household has an automobile; 0 otherwise

moto = binary equal to 1 if household has a motorcycle; 0 otherwise

Table B: Targeting performance (in per cent) for the child population (0-14 years old)

Real status	Predicted status	
	Non poor	Poor
NATIONAL		
Non poor	62.9	37.1
Poor	19.6	80.4
URBAN		
Non poor	60.9	39.1
Poor	19.6	80.4
RURAL		
Non poor	64.2	35.8
Poor	19.6	80.4

Source: Authors' elaborations based on GLSS 5

Notes: The model correctly predicts the real status of children when the actual and predicted statuses are the same ("non-poor/non-poor"; "poor/poor"). On the contrary, it fails when statuses do not coincide, resulting in either leakage (actual status is "non-poor" and predicted status is "poor") or undercoverage (actual status is "poor" and predicted status is "non-poor")

Table C: Absolute numbers of children, total and by age groups

	children 0-14	children 0-5	children 6-10	children 11-14
Ghana	9,276,320	3,588,388	3,311,598	2,376,335

Source: authors' calculation based on GLSS5 and using sampling weights. The numbers take into account the child population growth between the year of the survey (2005/6) and the base-year of this study (2008)

Annex III

Table A: GDP growth rates under various scenarios (per cent)

	BaU	Crisis	Response 1	Response 2	Response 3	Response 4
2009	7.0	5.1	5.3	5.3	5.1	5.1
2010	7.3	3.8	3.8	3.8	3.8	3.8
2011	7.3	6.5	6.5	6.5	6.5	6.5

Source: Authors' calculation based on simulations

Table B: Price effects under various scenarios (per cent)

	BaU	Crisis	Response 1	Response 2	Response 3	Response 4
Consumer prices						
2009	-2.3	4.2	2.5	3.6	4.2	4.2
2010	-3.8	5.8	5.8	5.8	5.8	5.8
2011	-3.9	0.6	0.7	0.6	0.6	0.6
Value added prices						
2009	4.2	0.8	1.7	1.3	1.0	0.8
2010	5.5	-5.3	-5.2	-5.2	-5.2	-5.3
2011	6.3	0.7	0.7	0.7	0.6	0.7

Source: Authors' calculation based on simulations

Table C: Wage and employment effects under various scenarios (per cent)

	BaU	Crisis	Response 1	Response 2	Response 3	Response 4
Formal work						
2009	3.1	2.0	2.3	2.3	2.1	2.3
2010	4.1	-0.6	-0.6	-0.7	-0.5	-0.7
2011	4.1	1.8	1.8	1.8	1.9	1.8
Informal wage						
2009	10.8	6.7	8.2	7.5	7.0	6.8
2010	13.4	-3.8	-3.7	-3.7	-3.7	-3.8
2011	15.0	5.9	5.9	5.8	5.8	5.8
Informal work						
2009	2.2	3.0	2.8	2.8	2.9	3.0
2010	1.5	4.9	4.9	5.0	4.9	4.9
2011	1.5	3.2	3.2	3.2	3.1	3.2

Source: Authors' calculation based on simulations