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Simulation of the effects of the economic crisis and response policies on children in West and Central Africa: the case of Burkina Faso

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Summary: Burkina Faso's hard earned economic gains in recent years have been eroded by the 2008-09 world financial and economic crisis. The country will particularly feel the effects of the world economic crisis due to its close links with the world economy. Most of the adverse effects are transmitted to households then passed onto children. The situation of children principally depends on the monetary and non-monetary wellbeing of their household. This, together with their greater vulnerability, means that children are at risk of suffering more, and for longer, from the impacts of the crisis. It is therefore crucial to understand and anticipate the effects that the crisis may have on children in Burkina Faso and to propose options for social protection to counter these effects.

To this end, we propose a macro-micro economic approach. Macro-micro economic analysis uses a general calculable equilibrium (CGE) model to simulate the impacts of various transmission channels of the crisis to the Burkinabe economy. The results of these simulations are then used for the micro-econometric analysis, which integrates individual and household economic behaviour to evaluate the impact of the crisis on child welfare.

According to our simulations, which run from 2009 to 2011, the financial crisis respectively leads to 5 and 1 percentage point increases in the incidence of monetary and caloric poverty among Burkinabe children. Moreover, the school enrolment rate for children will decline by about 0.7 percentage points due to the crisis, while the child labour rate will increase by about 1 percentage point. Finally, a 1 percentage point decrease in the medical consultation rate among children is expected, along with substitution from modern health services to traditional medicine. Large regional and rural vs. urban gaps are also noted.

A monetary transfer policy targeting poor children appears to be the most effective at reversing the negative effects of the crisis and returning to the trend that would have existed without the crisis. Such a policy, financed by external aid and with a budget of 1% of GDP, re-establishes the trend that monetary poverty would have followed in the absence of a crisis and even leads to a reduction in hunger. It also limits the crisis' adverse effects on school enrolment, child labour and sick children's access to modern health care services. A universal (non-targeted) variant of this transfer policy for 0-5 year-olds has similar results and is easier to enact. Policies which subsidize food and cereals, as well as monetary transfer policies for the Centre and Mouhoun regions (the areas most affected by the August-September 2009 floods) were also analyzed.

Key words: world economic crisis, child poverty, hunger, education, child labour health, West and Central Africa, 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

Acronyms and abbreviations

AMV	Anti-measles vaccine
ATV	Anti-tetanus vaccine
BCG	Baccille Calmette-Guérin vaccine
CES	Constant elasticity of substitution
CET	Constant elasticity of transformation
CFA	African Financial Community
CGE	Calculable General Equilibrium Model
CSPS	Health and Social Promotion Centre
DGEP	Directorate General for Economy and Planning
DGPSA	Directorate General for Agricultural Forecasts and Statistics
DHS	Demographic and Health Survey
DTP	Diphtheria-Tetanus-Pertussis (vaccination)
ECVM	Enquête sur les Conditions de Vie des Ménages
FDI	Foreign direct investment
FOB	Free on board
GDP	Gross Domestic Product
HIPC	Harmonized index of consumer prices
IMF	International Monetary Fund
INSD	National Institute of Statistics and Demography
MEBA	Ministry of Basic Education and Literacy
OECD	Organization for Economic Cooperation and Development
PPP	Purchasing Power Parity
QUIBB	Unified questionnaire of basic indicators of Burkina Faso
SAM	Social accounting matrix
UNCTAD	United Nations Conference on Trade and Development
USA	United States of America
WDI	World Development Indicators
YF	Yellow fever vaccine
ZACA	Commercial and administrative zone

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INTRODUCTION

The world financial and economic crisis, which grew out of the 2007 mortgage crisis in the United States, could compromise recent growth and poverty reduction efforts that have been undertaken by many developing countries. This comes just after these economies were hit by the energy and food crises.

Burkina Faso, much like the rest of the world, has seen its hard earned economic gains of recent years eroded by the world financial and economic crisis. While its financial system weathered the world financial crisis well, Burkina Faso's links to the global economy mean that it is not immune to the effects of the world economic crisis. The country depends on international trade in goods and services as well as foreign investment. External public aid is a significant source of funding for the country's development. Transfers from Burkinabe living abroad are also an important source of income for the country.

After having averaged 5% real growth over the decade, the Burkinabe economy can be expected to slow due to the world economic crisis. In its April 2009 report on the economic outlook for Sub-Saharan Africa (IMF, 2009a), the International Monetary Fund (IMF) forecast growth of 3.5 and 4.1% for the Burkinabe economy respectively for 2009 and 2010. These figures are clearly lower than the growth rate of 5% registered in 2008.

The negative effects of the crisis are transmitted to vulnerable populations in developing countries, such as children, through several channels. Most of these effects are first transmitted to households and are then passed on to children. As such, the situation of children can alter as a result of changing monetary and non-monetary welfare within their households.

The macroeconomic and distributive effects in developing countries will largely depend on the size of the crisis in developed countries, the initial conditions in each country and the macroeconomic policies in response to the crisis. However, formulating practical and appropriate recommendations to stimulate growth and protect vulnerable populations such as children from the negative effects of the crisis requires an understanding of the expected effects of the crisis in industrialized and emerging countries and its principal channels of transmission to developing countries, as well as a quantitative evaluation of its economic and social effects.

The present report aims to analyze the potential effects that the world economic and financial crisis and possible policy responses have on child welfare in Burkina Faso using a multidimensional approach. The impacts on monetary and caloric poverty, education and child labour, as well as access to health care services, are analyzed. The report is structured in five sections. Section 1 includes a brief discussion of the crisis' expected effects. The methodological approach is summarized in section 2. The results of the crisis scenarios and the policy responses are sequentially presented in sections 3 and 4. The final section draws conclusions and outlines recommendations.

1. EXPECTED EFFECTS OF THE ECONOMIC CRISIS IN BURKINA FASO

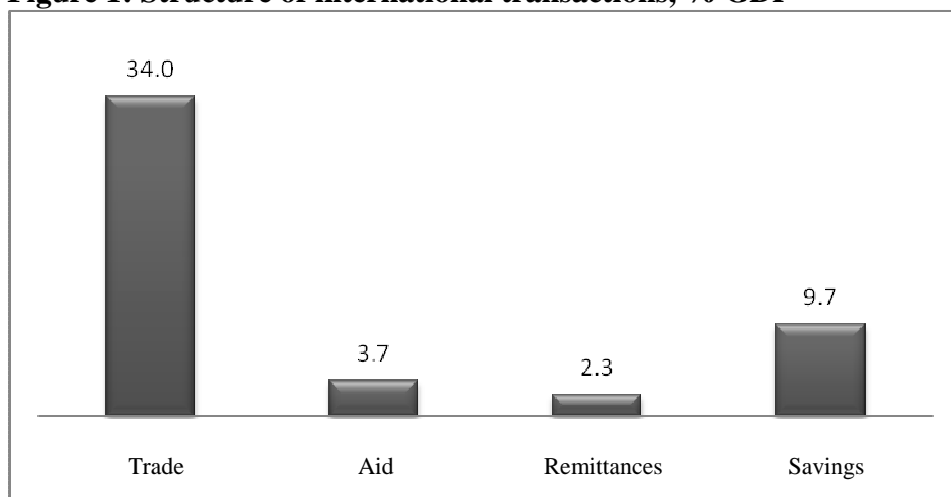
The world economy experienced its worst performance since the Second World War in 2009 according to the IMF (IMF, 2009b), with a 1.4% drop in global economic production in that year. Strong and growing interdependence between economies considerably increased the vulnerability of countries facing the economic crisis.

Analysts are unanimous about its global impact and refute any “decoupling” of growth in developing countries. Growth in Sub-Saharan Africa fell by nearly two-thirds according to the IMF (IMF, 2010a), from 5.5% in 2008 to 2.1% in 2009.

Growth in Burkina Faso is somewhat less affected and should be around 3.5% in 2009, which is still a significant slowdown compared to the 5.0% growth registered in 2008 (IMF, 2009). Higher oil prices, lower repatriation of savings and a large-scale return of Burkinabe nationals living abroad are among the factors which most heavily influenced the economy of Burkina Faso over the 2000-2008 period.

While international trade, foreign capital and investment flows, private remittances and public development assistance are found to be the primary transmission channels, their respective contributions are likely to differ from one country to another. With a 34% trade openness rate, trade is the most important transmission channel of the world crisis to Burkina Faso (figure 1). This is followed by foreign capital transfers, which are nearly 10% of GDP. However, development assistance and private remittances, which are respectively 3.7 and 2.3% of GDP, are not large enough to generate a significant impact on the Burkinabe economy.¹

Figure 1: Structure of international transactions, % GDP



Source: Developed by the authors from the 2004 national accounts

Changes in external trade variables, i.e. prices and volumes of imports and exports, affect the trade balance and ultimately the real exchange rate. The size of the exchange rate adjustment required to balance the current account balance depends on the price and volume shocks suffered by the main products imported and exported by Burkina Faso, as well as the level of economic openness for trade.

Although the consequences of the crisis are felt in all economic sectors, those which are directly linked to external markets, i.e., which are primarily export sectors, are particularly threatened by the forecast of reduced world demand. Indeed, over the last few years, Burkina Faso’s exports have been dominated by products which depend on demand conditions, primarily cotton fibre and livestock products.

Table 1 presents the structure of Burkinabe trade. It shows that “*capital goods and machinery*”, “*hydrocarbons and energy*” and “*food products*” are the main products imported, respectively representing 36.8, 29.1 and 12.8% of the total value of the country’s imports.

¹ However, it should be noted that these ratios differ significantly from the World Bank figures, respectively 13.7 and 0.7 percent of GDP in 2007 (WDI 2009).

The country's main exports are "cotton" and "livestock products" which account for 56.6 and 13.6% of the total value. The crisis' effects on the prices and traded volumes of these products would primarily affect the external current account and the exchange rate.

Table 1: Structure of external trade

	Millions \$US	Per cent
Total exports (FOB)	625	100.0
Cotton	354	56.6
Livestock products	85	13.6
Others	186	29.8
Total imports (CAF)	1036	100.0
Food products	133	12.8
Hydrocarbons and energy	301	29.1
Capital goods and machinery	381	36.8
Others	221	21.3

Source: World Bank (2008)

Foreign investments in Burkina Faso are also expected to decline due to uncertainty and risk aversion. Foreign direct investments (FDI) mostly originate from France and China and are destined for mining, road infrastructure and the manufacturing sector. However, the international financial and economic crisis reduces the profitability of many investment projects, leading to deferral of projects such as the ZACA project, a vast construction project in Ouagadougou. A number of road interchange projects have also not yet begun. Altogether, according to the estimates of the Directorate General of Economy and Planning (DGEP), FDI was 36.5 billion CFA francs in 2008, less than a third of their level in 2007. The reduction in FDI appears to be greater with the contraction in the global economy.

Flows of foreign development aid may be negatively affected by the world financial and economic crisis. Mobilization of this traditional source of financing not only depends on conditions in donor countries, but also on performance along with the IMF's "Economic Policy Support Instrument" (EPSI) program. IMF forecasts indicate a slight decline in foreign development aid received by Burkina Faso from 2.9% of GDP in 2008 to 2.8% of GDP in 2009.

Transfers from Burkinabe citizens abroad could also suffer from declining economic activity and purchasing power in industrialized countries. The DGEP forecast shows a 2.2% decline in the amount of funds from emigrants, with direct effects on household consumption.

2. METHODOLOGICAL APPROACH

The analysis of the impact of the world economic crisis and the policy response options on the welfare of children in Burkina Faso uses a macro-micro economic approach. The macroeconomic analysis uses a calculable general equilibrium (CGE) model to evaluate the impact of various transmission channels of the crisis to the Burkinabe economy. The model is combined with a micro-econometric analysis which explores the microeconomic behaviour of individuals and households and evaluates the impact of the crisis on the well-being of children. For a detailed presentation of the methodology, see Bibi, Cockburn, Fofana and Tiberti (2010).

2.1 Macroeconomic analysis: shocks and their price and employment effects

A CGE has the advantage of capturing the structural effects of the economies being modelled as well as the direct and indirect effects of shocks and macroeconomic policies. It highlights the interactions between different actors in the economy. Most of the equations are derived from rigorous microeconomic foundations specifying how agents adjust the quantities demanded and supplied on each market in response to price variations. There are also a number of macroeconomic equations ensuring that economic agents' behaviours are consistent with macroeconomic constraints. The resulting model is then used as a sort of "laboratory" to simulate the impacts of shocks and economic policies.

In order to predict the effects of the world economic crisis on the Burkinabe economy, four principal transmission channels have been taken into consideration: external trade, private remittances, foreign development aid and foreign investments.

- *Trade*

The global crisis is expected to reduce world trade and will thus affect the national economy by lowering demand for its primary export products. Prices of exported and imported products are likely to fall because they are directly linked to declining world import and export prices. Changes in volumes and prices of exports and imports due to the world financial and economic crisis are induced by adjustments in the exchange rate or internal prices. Changes in the trade channel are simulated by reduced export demand and international prices for imported products. These variables are exogenous in the CGE.

- *Private international remittances*

Household income is derived from payments for production factors (labour and capital) and transfers from other households, firms, the government and from abroad. A direct impact of a global recession is reduced remittances from family members living and working abroad. This leads to lower income and, consequently, lower domestic demand via reduced consumption and savings/investment. This situation increases pressure on the current external account balance, leading to depreciation of the real exchange rate, which in turn increases domestic prices. Foreign transfers are an exogenous variable in the CGE via which a portion of the crisis shock is transmitted.

- *Foreign development aid*

The government is passive in the sense that it does not optimize an objective function. Its role is limited to that of regulating economic activity and distributing wealth. Its income is derived from trade taxes, taxes on products net of subsidies, direct taxes, interest and dividends, and net foreign aid and borrowing. Its expenditures include transfers to domestic and foreign institutions (debt payments) and current expenditures for services in the public sector. The government's current account is changed through its primary balance. The financial and economic crisis can be expected to affect the flow of aid, impacting on the public budget balance and the current external account. External aid flows are also exogenous and are modified to simulate their evolution due to the global economic recession.

- *Foreign investment*

The current account, the capital account and changes in reserves are the three components of the balance of payments. The capital account includes net foreign direct investments and other capital transactions

with the world economy. Since international reserves are held as fixed, the current account balance is constrained by the capital account balance.

As such, a deficit in the current account corresponds with a capital account surplus, which indicates foreign savings available for local investment. The total savings of households, firms, the government and the rest of the world, finance total investment. Thus, lower foreign savings reduce the capacity for investment in developing countries.

Total investment net of public investment and foreign direct investment is distributed between the productive sectors as a function of the relative rates of return and the cost of using capital in those sectors. This last is equal to the dual price of investment times the sum of the depreciation and interest rates.

The sectoral stocks of private capital are updated using a capital accumulation equation which includes the depreciation rate, investment and FDI flows in each sector.

The world recession reduces direct investment and other foreign capital inflows, thus also lowering the capacity for investment in developing countries. In a context of tight international credit conditions, the trade market balances out via adjustments in the exchange rate or domestic prices. These countries, having accumulated foreign reserves over previous years, are in a position where they can counter lower FDI flows with an increase in other capital flows in order to rebalance the current account.

2.2 Links between the macro and micro economic analyses

In order to evaluate the distributive effects of the crisis shock and possible policy responses, it is first necessary to send price changes – of products and factors – and employment levels to the microeconomic module. This is done following a “top-down” sequential approach (Robillard, Bourguignon and Robinson 2008). The analysis can therefore capture the price and reallocation effects of the world economic crisis. The micro and macro modules are carried out sequentially over three periods: 2008-09, 2009-10 and 2010-11.

The links between the macro and microeconomic modules are changes in the prices of products for consumption or production, wages and the level of employment for different categories of workers simulated by the CGE, income for agricultural and non agricultural family businesses, dividends and private transfers. This information is then used as inputs for the microeconomic analysis at the level of individual households. The advantage of the microsimulation approach is its capacity to capture heterogeneity of households’ income sources and consumption profiles in order to analyze the intergroup and intragroup distribution of poverty and inequality.

2.3 Microeconomic analysis: child poverty and well-being

The microeconomic analysis aims to measure the effects of the financial crisis on five aspects of children’s living conditions: (1) monetary poverty, (2) caloric poverty, (3) education, (4) child labour and (5) access to health services.

In this study, a child is defined as being *poor in monetary terms* if they live in a household where consumption per adult equivalent,² deflated by appropriate temporal and spatial price indexes, is under

² The equivalence scales used were constructed in consideration of the minimum caloric needs by sex and age group.

the official monetary poverty threshold of 82,672 CFA per year. However, this poverty line does not meet the minimum needs of individuals in Burkina Faso and is lower than the international absolute poverty line used by the World Bank of \$1.25 at PPP. The use of this official poverty line enormously underestimates poverty in Burkina Faso and its revision is therefore urgent (for more on this see Cockburn, Fofana and Tiberti 2010).

To analyze monetary poverty among children in the initial situation as well as in the aforementioned scenarios, we look at the incidence of poverty among children aged 0 to 14 years. Total real consumption, as defined above, is the variable used to evaluate the effects of the crisis. This variable is in fact affected by changes, simulated at the macroeconomic level, in consumption, prices, wage and employment rates, profits for agricultural and non agricultural family firms, dividends and private transfers.

The monetary values of household consumption for the different food products bought and self consumed have been converted into quantities using the prices on the geographically nearest market. These quantities are then determined at the level of individuals (per adult equivalent) by dividing them by the household equivalence scale. They are then converted into calories using nutritional tables (Barikmo et al. 2004) and compared to the minimal caloric needs of 2283 kilocalories³ per day for an adult male in order to assess caloric poverty. This figure allows us to calculate the incidence of *caloric poverty* among children. Changes in prices for food goods as well as income affect quantities of food products consumed and, thus, on caloric consumption in the microeconomic model as per Bibi et al. (2010).

School enrolment and *child labour* are analyzed together, yielding four possible cases: (1) “school/no work”, (2) “school/work”, (3) “no school/work”, (4) “no school/no work”. The probabilities of being in each of these states are modelled using a simultaneous choice bi-probit regression. These probabilities correspond to the average share of children in each of the four cases. Due to the lack of detail in the survey, child labour is considered as engagement in any economic activity, whether or not it is remunerated and regardless of the number of hours spent, or family labour (domestic work is thus not included). Among the explanatory variables, real household consumption per adult equivalent serves as the transmission variable for the crisis and policy responses on children’s participation in school and labour.

For *access to health care services*, sick children’s consultation rate and the choice of the type of service consulted were analyzed. Four types of health care services are specified: (1) public or regional health care services, (2) private or NGO health care services, (3) basic health services, such as Health and Social Promotion Centres, and (4) traditional healers, marabout and others. The probabilities of consultation and the choice of the type of service were modelled, respectively, using probit and multinomial logit regressions. The probabilities are the average proportion of children consulting each of the four types of services. The household’s real consumption arises as an explanatory variable. Using the predicted changes for the simulated scenarios – crisis and policy responses – we estimate the impacts on access to health care services.

Finally, to simulate a policy of targeted cash transfers to children, we have constructed an econometric model of a type that the government should adopt to predict the state of poverty among households and their children. Following a proxy-means approach, real consumption was regressed on a limited number

³ This caloric poverty threshold is the same as the one used to estimate the cost of the food component of the absolute monetary poverty threshold.

of easily observable socio-demographic characteristics at the household level. See tables 1 and 2 in the annex for the targeting and the coefficients for the variables used.

For more details about the methodology, see Bibi, Cockburn, Fofana and Tiberti (2010).

2.4 Data

The data for the CGE is from the 2008 social accountability matrix (SAM) for Burkina Faso, described in table 2. It identifies economic relations over six sets of accounts: (1) 28 activities; (2) 28 goods and services (each activity produces a single good or service and each good and service is only produced by one activity); (3) 7 production factors (6 types of workers and one category of capital), (4) 8 categories of households according to the activity of the household head (3 employees, 3 agricultural and 2 non agricultural), (5) 2 other institutional agents: the government and the rest of the world; (6) 1 savings-investment account.

Table 2: Description of the 2008 SAM for Burkina Faso

Group	Description
Activities/goods	
Agriculture (9)	Grains; Fruits and vegetables; Cotton; Other cash crops; Cattle; Other livestock; Livestock products; Forestry; Fisheries
Industry (8)	Mining and quarrying; Modern drinks and tobacco; Textiles; Electricity, natural gas and water; Other modern industries; Informal industries; Modern construction; and Informal construction
Services (11)	Modern trade; Informal trade; Modern transport; Informal transport; Post and telecommunications; Financial services; Hotel; Other modern commercial services; Other informal commercial services; Private and parapublic non commercial services; Public non commercial services.
Production factors	
Labour (6)	Informal rural; Formal rural; Formal qualified urban; Formal non qualified urban; Informal qualified urban; and Informal non qualified urban
Capital (1)	Capital
Institutions	
Households (8)	Public sector employees; Formal private sector employees; Informal sector employees; Cotton producers; Livestock farmers; Other farmers; Non agricultural employees; and Inactive
Others (2)	Government; and rest of the world

The microeconomic analysis is based on household and individual data obtained from the 2003 "Enquête sur les Conditions de Vie des Ménages" (ECVM 2003), which is the most recent survey available at the time of writing. This survey collected sociodemographic and economic data on households and individuals, including children, relating mainly to households' food and non food consumption, as well as on education, labour and individuals' access to health care services.

3 CRISIS SCENARIOS AND RESULTS

The scenarios simulated in this study are based, in part, on assumptions about future changes in the principal variables which transmit the world economic crisis to the Burkinabe economy, and also on response policies that the state could choose to limit the crisis' impacts on the welfare of children in Burkina Faso.

3.1. Scenarios with and without economic crisis

The July 2009 IMF report (IMF 2009b) highlights a fragile stabilization and a slow recovery of the global economy. However, a sustained recovery in economic activity in industrialized countries is forecast for the second half of 2010, according to the same report. On the basis of recent information on the state of the world economy, the study formulates and tests the following scenarios:

- *The scenario without crisis or of continuity*, also the *reference scenario*, which serves as a basis of reference for the later scenarios. The transmission variables follow their pre-crisis trends in this scenario.
- *The crisis scenario*, which postulates a deterioration in transmission variables between 2008 and 2009 ("2008/2009"), a rebound in import prices and a stagnant trend for other transmission variables between 2009 and 2010 ("2009/2010"), and finally a recovery for all transmission variables between 2010 and 2011 ("2010/2011").

The following sections discuss the implications for the economy of Burkina Faso of these scenarios for each of the transmission variables and the world economic crisis.

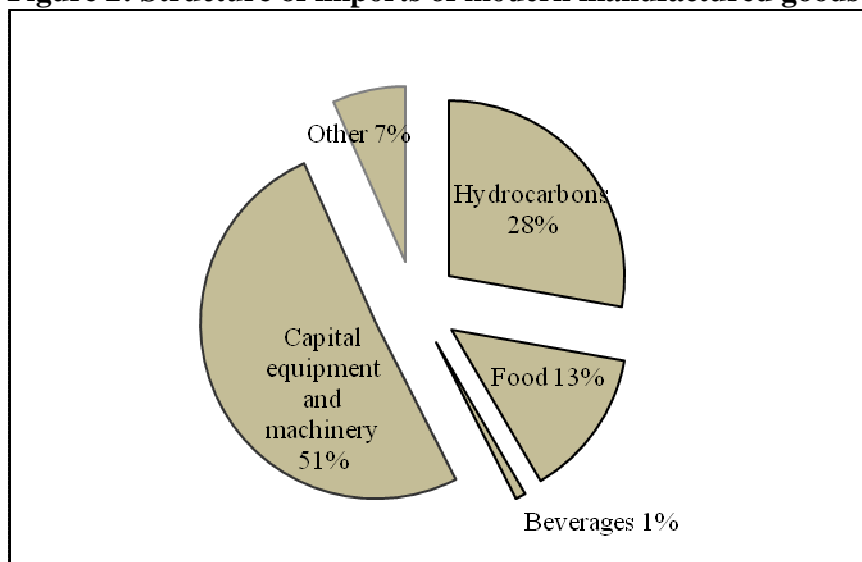
3.1.1. Imports and exports

The world economic crisis has non-negligible repercussions for goods and services traded by Burkina Faso. We mentioned earlier that imports of "*modern manufactured goods*"⁴ and exports of "*cotton fibre*" and "*livestock products*" are the basis of the country's trade. We present below the presumed price changes for "*modern manufactured goods*" and those of export demand for "*cotton fibre*" and "*livestock products*".

The data for changes in world prices for many traded goods comes from the IMF (IMF 2010b). This data is the starting point for constructing scenarios of future changes in import prices for Burkina Faso. The IMF price is used directly when the product category is exactly the same as specified in the model. When this is not the case, a price index is constructed by weighting several IMF prices in proportion to their respective shares of imports. Modern manufactured goods comprise nearly 80% of imports for Burkina Faso and the shares of individual goods are presented in figure 2. Figure 3 illustrates the change in the world price index for "*modern manufactured products*" from September 1999 to August 2009, and the forecast from September 2009 to December 2011, according to the reference and crisis scenarios simulated in this study.

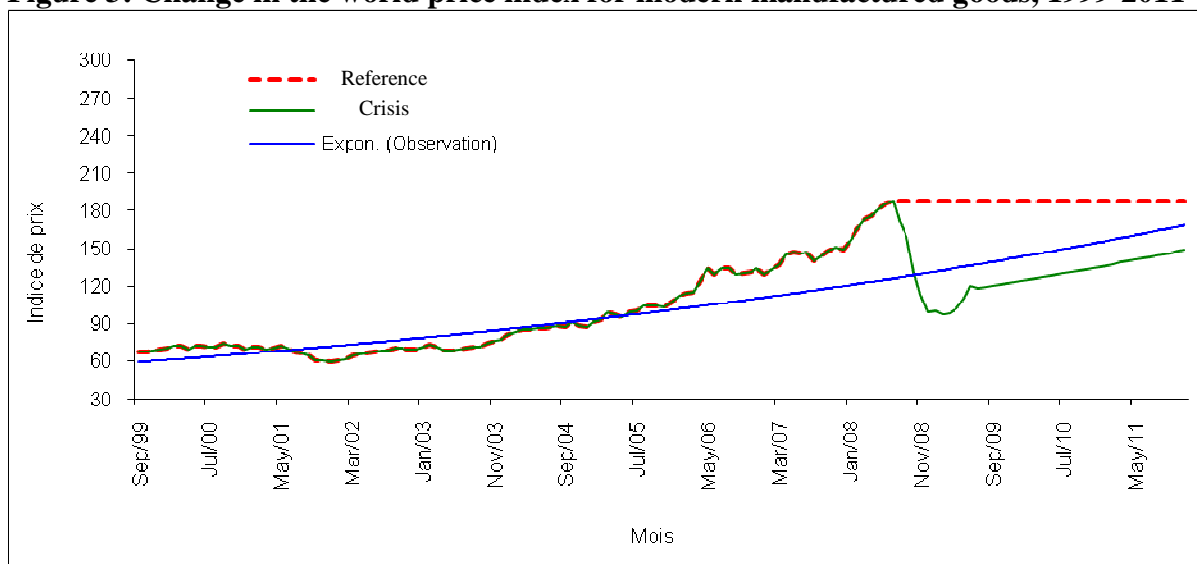
⁴ Following the nomenclature of the national accounts used in this study; these imports are mostly capital goods and machinery, petroleum products and food products, which together amount to 79 per cent of the total.

Figure 2: Structure of imports of modern manufactured goods



Source: 2004 national accounts.

Figure 3: Change in the world price index for modern manufactured goods, 1999-2011



Source: Author’s calculations from IMF data (IMF 2010b) and 2004 national accounts.

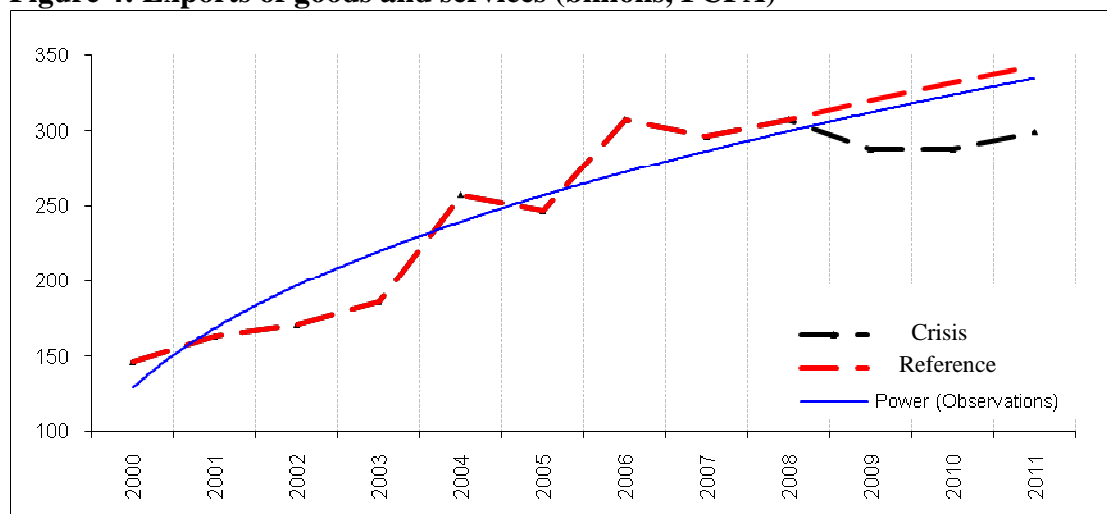
Note: Reference year for the price index = 2005. As of mid-2008, the series for the reference scenario follows the pre-crisis trend; as of September 2009 the series for the crisis scenario follows the assumptions formulated in section 3.1.

In the absence of a crisis (red/dashed), we postulate stagnant prices for imports following the increases experienced during the food crisis. In the crisis scenario, prices are observed until the third quarter of 2009, with a substantial decline in prices from mid-2008 to mid-2009 and an upward correction during the third quarter of 2009 (green). In the crisis scenario, we postulate that this price recovery continues throughout the period of analysis, following the historical trend (blue) through to mid-2011.

Exports of goods and services from Burkina Faso to the rest of the world constitute an important transmission channel of the global economic crisis. The main exports from Burkina Faso, “ginned cotton” and “livestock products”, increased by 110% between 2000 and 2008 (figure 4). This was largely due to an increase in the volume of exports; cotton represents 60% of total exports, but its price only

increased by an average of 20% over the period (figure 5). Extending this trend into the future, we expect 3 to 4% annual growth in the volume of exports in the following years in the no-crisis scenario.

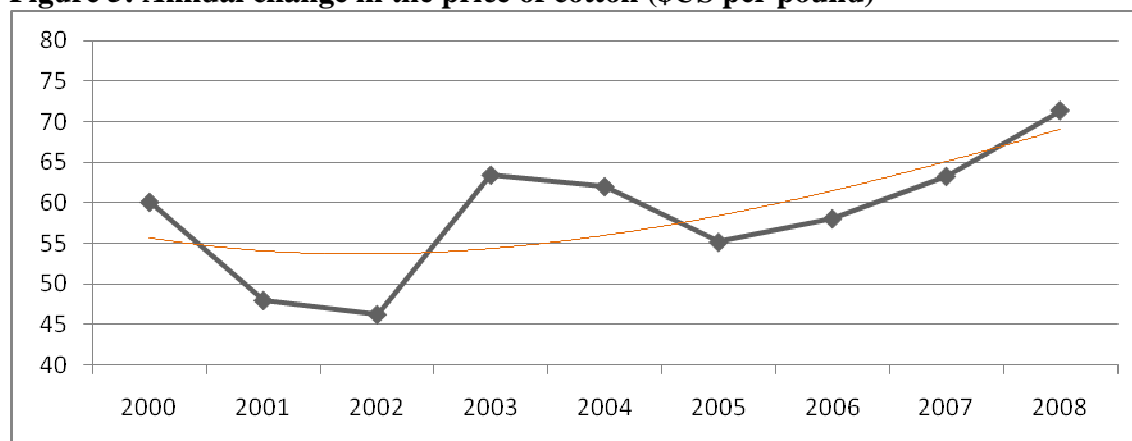
Figure 4: Exports of goods and services (billions, FCFA)



Source: World Bank (2008)

Note: As of mid-2008, the series for the reference scenario follows the pre-crisis trend and the series for the crisis scenario follows the assumptions formulated in section 3.1.

Figure 5: Annual change in the price of cotton (\$US per pound)



Sources: IMF (2010b)

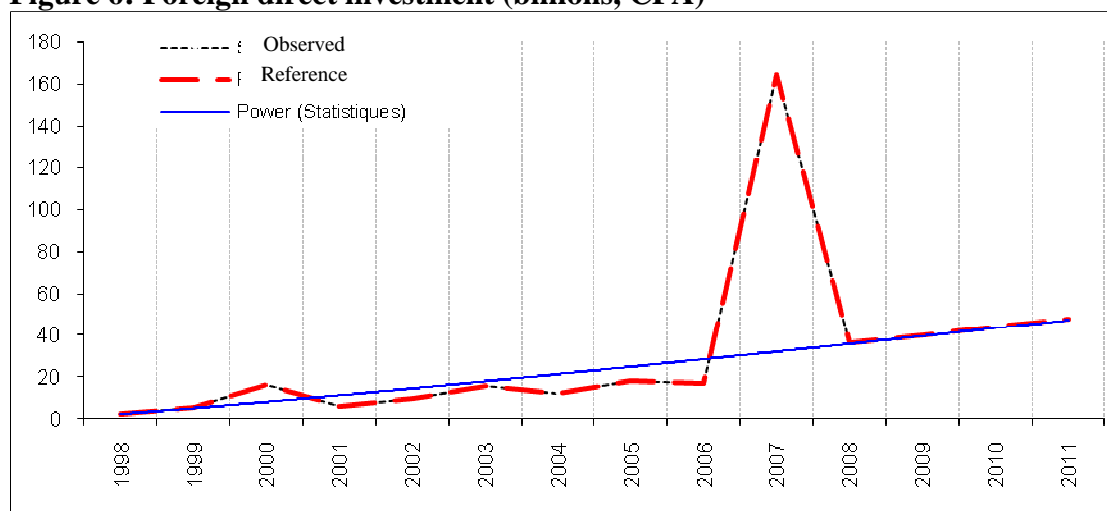
In the crisis scenario, the changes in 2009 export volumes are based on IMF estimates for emerging and developing countries (IMF 2009b). Lacking precise information for Burkina Faso or for some products, we use their forecast of a 6.5% decline for these countries as a whole and apply this figure to Burkina Faso's total exports. The IMF anticipates a 1.4% recovery in exports from these counties in 2010, an assumption which we also make for 2010/2011 after stagnation in 2009/2010. Exports from Burkina Faso are thus expected to recover in mid-2010 to follow the trend from earlier years.

3.1.2. Other crisis transmission variables

Foreign investment in Burkina Faso should decline due to the economic and financial crisis. The country has an active policy to attract foreign investment thanks to tax concessions. Investments in mining, telecommunications and financial services remain under public control. In 2008, net foreign investments

amounted to 36.5 billion CFA francs, after an exceptionally high level of 164 billion CFA francs in 2007, which was nearly ten times its level in 2006, as illustrated in figure 6. In the reference scenario, FDI follows the historical trend of nearly 10% annual growth, represented by the blue line in figure 6. According to the United Nations Conference on Trade and Development report (UNCTAD, 2009), worldwide FDI declined by 15% in 2008 relative to the previous year, a trend which is expected to continue in 2009. While Africa saw a significant increase in FDI in 2008 (34.7%), a more modest increase is expected for 2009 if we look at the most recent statistics on “Mergers and Acquisitions”, the main component of FDI. These show a significant decline between the first quarters of 2008 and 2009 (figure 7). Thus, in the economic crisis scenario, we postulate that the trend in the evolution of FDI over the following years should not differ significantly from its main component, “Mergers and Acquisitions”. Furthermore, the trend for “Other capital transfers” should also be fairly similar to FDI. Consequently, FDI would decrease by 42% in 2008/09, register an annual growth rate of zero in 2009/10, and return to the historical trend of nearly 10% growth in 2010/11.

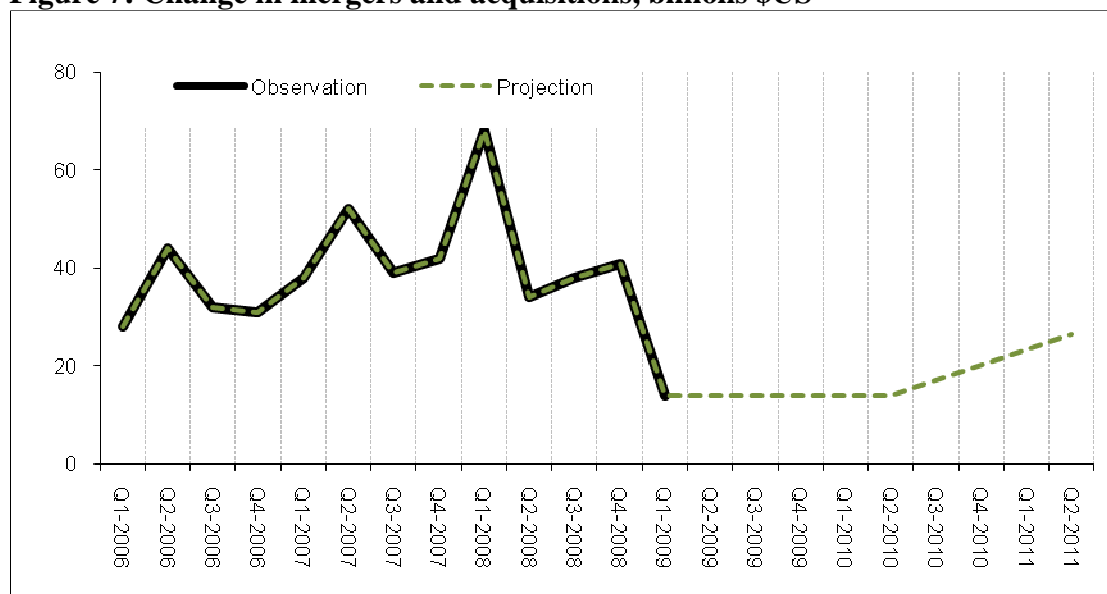
Figure 6: Foreign direct investment (billions, CFA)



Source: The Directorate General of Economy and Planning database

Note: As of mid-2008, the series for the reference scenario follows the pre-crisis trend and the series for the crisis scenario follows the hypotheses formulated in section 3.1

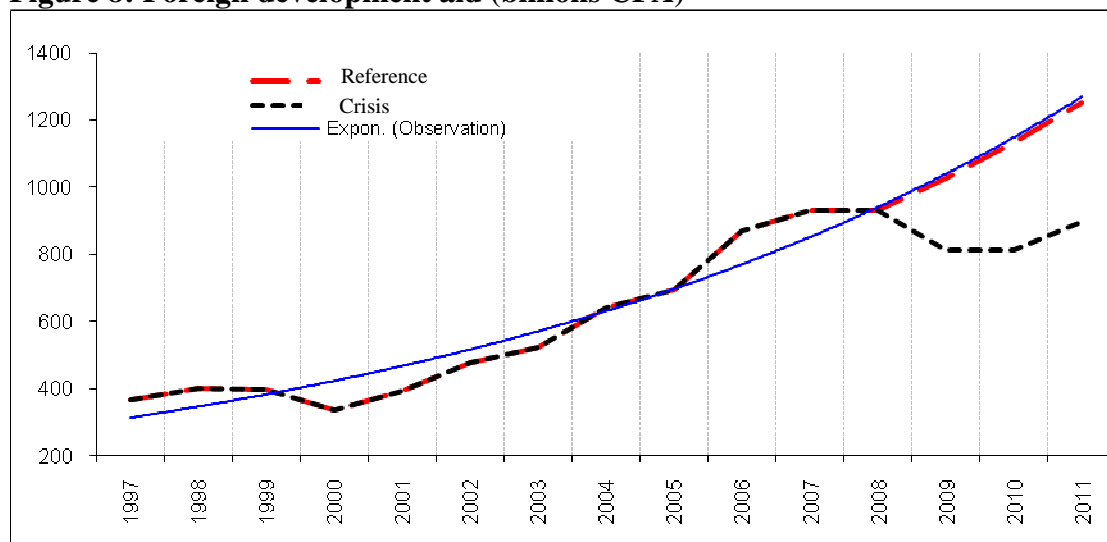
Figure 7: Change in mergers and acquisitions, billions \$US



Source: Data from the UNCTAD database

In the reference scenario, *foreign development aid* evolves according to the trend in the previous year (blue line in figure 8) with an annual average increase of 10%. A decline in foreign development aid for Burkina Faso is expected in 2009 according to the European Report on Development (2009). As such, on the basis of this report, our crisis scenario projects nearly a 13% contraction in aid received by Burkina Faso in 2009 compared to 2008. As seen for other crisis transmission variables, no change is expected for 2009/10, while aid recovers in 2010/11 to follow the trend observed in previous years.

Figure 8: Foreign development aid (billions CFA)

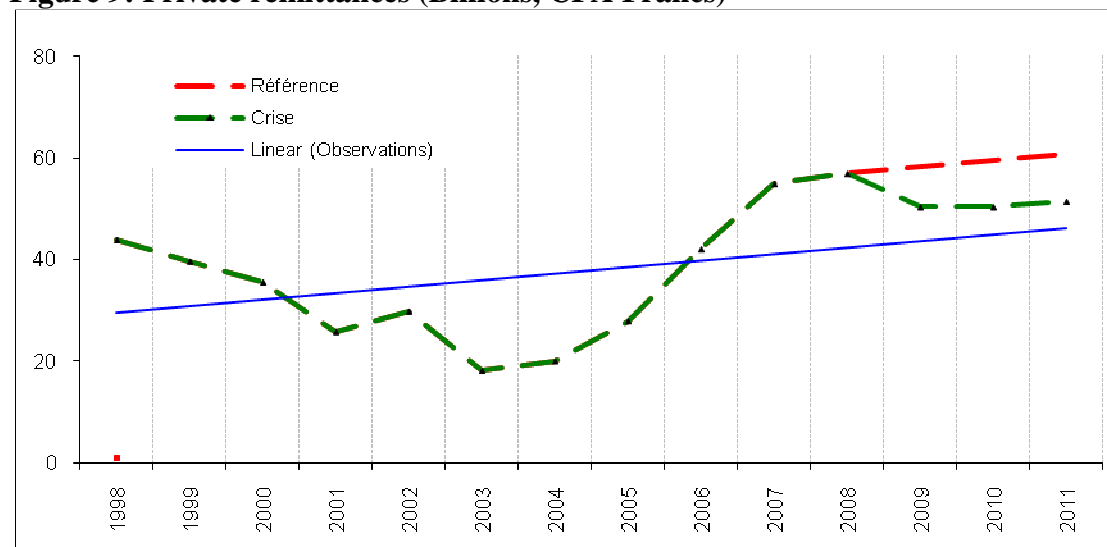


Source: Data from the Directorate General of Economy and Planning database

Note: As of mid-2008, the series for the reference scenario follows the pre-crisis trend and the series for the crisis scenario follows the hypotheses formulated in section 3.1

In the reference scenario, *private remittances* increase by 2% in annual terms, following the previous trend presented in figure 9. In its July 2009 report on the impact of the world economic crisis on international remittances, the World Bank projected an 8 to 12% decline in private remittances to sub-Saharan African countries. Our scenario of declining private remittances in 2008/09 corresponds with the latter value (the lower bound of the World Bank projection). This figure is expected to remain stable in 2009/10, with a projected recovery to 2% growth starting in 2010/11.

Figure 9: Private remittances (Billions, CFA Francs)



Source: Data from the Directorate General of Economy and Planning database
 Note: As of mid-2008, the series for the reference scenario follows the pre-crisis trend and the series for the crisis scenario follows the hypotheses formulated in section 3.1

3.2. Impacts of the economic crisis

We begin by analyzing the simulated macroeconomic effects of the crisis in general terms before focusing more specifically on the transmission variables, which then leads to the third stage of a microeconomic analysis of the crisis' impacts on child welfare in Burkina Faso.

3.2.1. Macroeconomic impacts

The changes in the transmission variables due to the economic crisis with respect to the values in the reference scenario, according to the assumptions stated above, are presented in percentage points in table 3.

Table 3: Differences in change for transmission variables, crisis vs. reference scenario (% points)

	2009	2010	2011
International trade			
- Average import price	-29.5	-23.7	-17.3
- Average export volumes	-10.1	-13.2	-13.2
Foreign investment	-34.0	-39.8	-39.8
International aid	-20.9	-28.4	-28.4
Private remittances	-13.5	-15.4	-15.4

Source: Authors' calculations using the results of the simulations

- *Effect on economic growth*

The simulated economic crisis leads to a 1 percentage point decline in the GDP growth rate with respect to the reference (no crisis) scenario in 2009 and 2010. Economic growth reduces by half this gap in 2011 (table 4).

Table 4: Annual GDP growth (%)

	Growth rate		Variation in percentage points
	Reference	Crisis	
2009	5.2	4.1	-1.1
2010	5.0	4.0	-1.1
2011	4.9	4.4	-0.5

Source: Authors' calculations using the results of the simulations

The slowdown in growth is principally induced by the decline in final private consumption and investments, while the impact of the crisis in terms of trade appears to improve net exports (table 5). Note that final public consumption is presumed constant in each of the scenarios.

Table 5: Differences in variation of components of GDP, crisis vs. reference scenario (% points)

	Final private consumption	Investment	Exports	Imports
2009	-5.1	-2.7	-10.1	-20.4
2010	-7.7	-7.7	-13.2	-32.3
2011	-8.6	-9.8	-13.2	-35.5

Source: Authors' calculations using the results of the simulations

- *Effects on trade*

The economic crisis reduces Burkina Faso's trade (table 6). Indeed, given the short term perspective of the analysis, the rigidity of the structure of production generates surplus export supply due to the decline

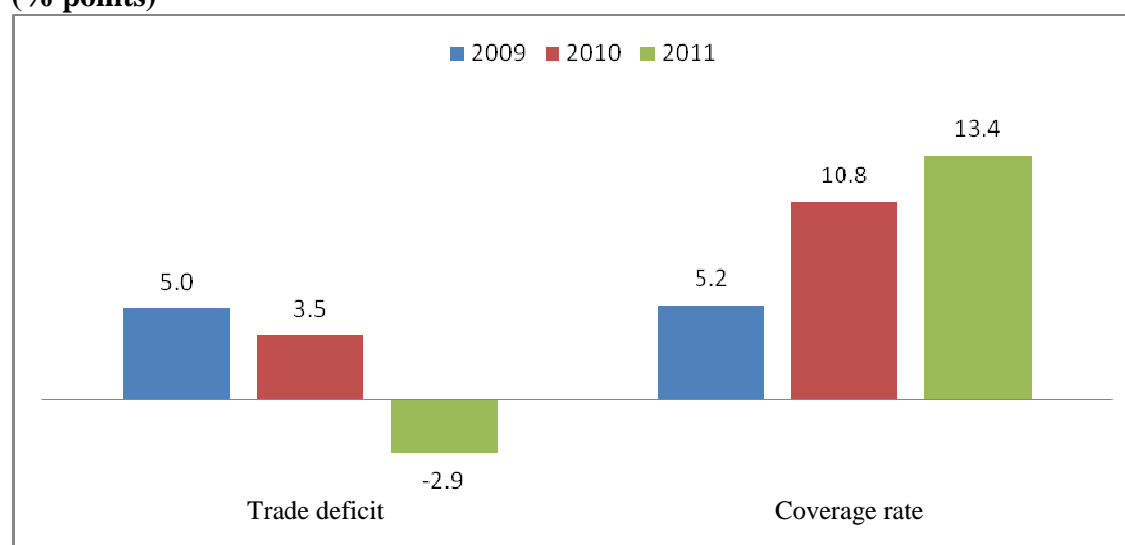
in demand, implying a substantial decline in export prices. Lower export prices contribute greatly to a sizeable decline in the real exchange rate which in turn lowers the volume of imports which become more expensive. Finally, the decline in the volume of imports is greater than the fall in exports, resulting in an improved coverage rate (figure 10). However, the price of products exported by Burkina Faso declines more than the price of imported products, resulting in a higher external trade deficit over the first two years of the crisis.

Table 6: Differences in effects on coverage rate of products, crisis vs. reference scenario, (% points)

	World import prices	Exports		Foreign investment	Foreign transfers	Exchange rate	Imports	
		Volume	FOB price				Price	Volume
2009	-29.5	-10.1	-45.4	-34.0	-18.2	76.1	24.3	-20.4
2010	-23.7	-13.2	-48.7	-39.8	-23.8	87.7	43.4	-32.3
2011	-17.3	-13.2	-45.6	-39.8	-24.1	78.9	48.0	-35.5

Source: Authors' calculations using the results of the simulations

Figure 10: Change in the deficit and the import/export ratio with respect to the reference scenario (% points)



Source: Authors' calculations using the results of the simulations

- **Effects on state revenue and savings**

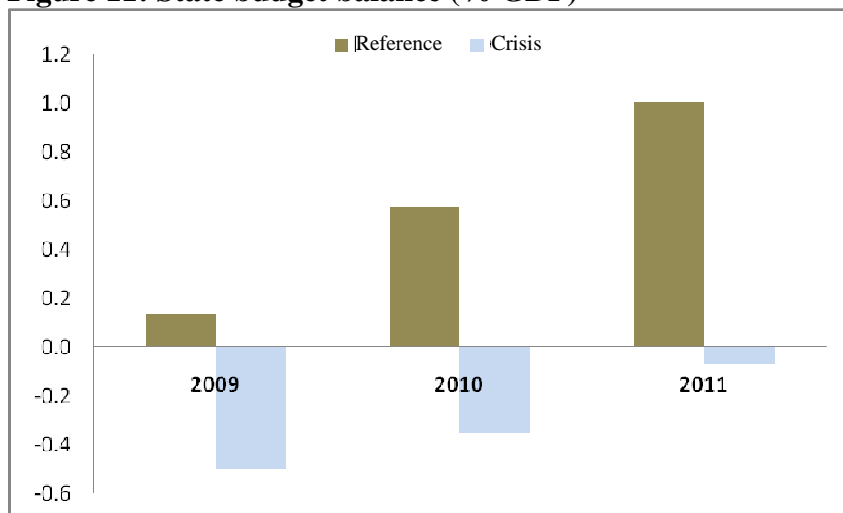
The economic crisis is expected to considerably reduce the revenue of Burkina Faso. This is due to reduced foreign development aid, trade taxes and, to a lesser extent, direct taxes on household income (table 7). Under the assumption of fixed per capita public expenditures, i.e. increasing at the rate of population growth, the state's budget deficit grows considerably in the crisis scenario due to falling revenue, whereas it registers continuous growth in the reference scenario (figure 11).

Table 7: Difference in the effects on state revenue, crisis vs. reference scenario (% points)

	Production taxes	Product taxes	Tariffs	Direct taxes	Transfer	Capital	Total income
2009	6.7	7.3	-3.1	-1.7	-20.9	-1.1	-2.8
2010	12.6	10.0	-5.1	-2.7	-28.4	-0.1	-4.0
2011	14.1	9.9	-6.6	-3.2	-28.4	-0.2	-4.6

Source: Authors' calculations using the results of the simulations

Figure 11: State budget balance (% GDP)



Source: Authors' calculations using the results of the simulations

3.2.2. Effects on microeconomic transmission variables

The crisis will have non-negligible effects on households according to the structure of their income and their consumption profile, via changes in the prices of goods and services and the level of employment for each category of workers. The following section analyzes the changes in these variables which transmit the economic crisis to households and their children.

- *Effects on product prices*

We have already seen that the economic crisis leads to a large decline in international prices of products imported and exported by Burkina Faso. Reduced transfers, foreign investment, external aid and export demand act together to lower the real exchange rate (table 8). Domestic prices – for consumption, production and value added – thus see a smaller decline and even increase in some cases.

When we compare sectors, we observe a decline in prices in agricultural sectors relative to the manufacturing and mining sectors. Indeed, these last benefit more from the increase in the real exchange rate due to their greater openness to trade (table 9), which moderates the effect of the fall in international prices.

Table 8: Differences in price changes, crisis vs. reference scenario, (% points)

	Year	External price		Real exchange rate	Internal price		
		Imports	Exports		Consumption	Production	Value added
Agriculture for export	2009	-17.2	-48.1	76.1	-7.1	-8.4	-11.3
	2010	-15.6	-53.4	87.7	-9.2	-10.8	-15.0
	2011	-14.1	-46.6	70.3	-4.4	-5.8	-8.9
Other agriculture	2009	-15.2	-48.7	76.1	-5.4	-5.9	-7.7
	2010	-10.8	-54.4	87.7	-8.4	-9.2	-11.8
	2011	-6.0	-48.0	70.3	-7.3	-8.0	-10.2
Mining	2009	-18.8	-43.8	76.1	7.6	2.4	-3.5
	2010	-17.8	-46.7	87.7	10.5	4.3	-5.7
	2011	-16.9	-39.9	70.3	9.4	4.6	-3.4
Manufacturing industries	2009	-30.4	-45.5	76.1	9.8	1.8	1.7
	2010	-24.4	-48.6	87.7	16.9	3.0	1.7
	2011	-17.9	-41.0	70.3	15.4	2.6	-0.3
Private services	2009	-23.4	-42.5	76.1	2.8	1.7	-3.6
	2010	-18.6	-45.7	87.7	4.2	2.6	-6.1
	2011	-13.6	-39.2	70.3	3.9	2.6	-5.3
Public services	2009	-	-44.8	76.1	1.1	1.0	0.0
	2010	-	-48.0	87.7	1.6	1.6	0.0
	2011	-	-41.0	70.3	1.4	1.4	0.0

Source: Authors' calculations using the results of the simulations

Table 9: Structure of trade per product category (%)

	Share		Intensity	
	Imports	Exports	Imports	Exports
Agriculture for export	0.3	4.3	1.3	7.0
Other export	1.9	3.4	1.5	1.0
Mining	0.4	2.7	13.4	26.2
Manufacturing industries	89.4	77.5	34.7	15.2
Private services	8.0	10.6	3.8	2.1
Public services	-	1.5	-	0.5

Source: Authors' calculations using the results of the simulations

- *Effects on prices and volumes of productive factors*

The crisis affects household income by weakening their employment status and income from production factors (labour and capital). Workers would be more affected by the crisis than holders of capital as sectors which use capital intensively are relatively less touched by the crisis.

The crisis causes a contraction in the labour market and a reduction in formal employment for rural workers and non-qualified urban workers, causing them to turn to informal employment (table 10). This gap increases relative to the no-crisis situation in 2010 and 2011. Indeed, despite improving job creation in formal employment, the level remains much lower than it would have been in the absence of a crisis. The most striking contraction is in the agricultural sector, indicating that the displacement of individuals from formal to informal employment is primarily observed among rural workers.

In contrast, we observe the opposite trend in the formal sector in urban areas, although this movement is very small. This result can be explained by the fact that the services sector (which accounts for 81% of total wages for qualified urban workers, as opposed to 3% for agriculture) is not particularly affected by the crisis or substitution towards cheaper rural and non qualified workers in the informal sector.

Growth in informal rural and non-qualified urban labour supply causes wages to fall more for these workers than for qualified urban workers (table 11). Formal wage rates are presumed fixed.

Table 10: Differences in variation of volumes of factors, crisis vs. reference scenarios (% points)

	Capital	Labour	Formal labour				Informal labour			
			Total	Rural	Qualified	Non qualified	Total	Rural	Qualified	Non qualified
					urban	urban			urban	urban
2009	-0.1	0.0	0.0	-0.5	0.6	0.6	0.0	0.2	-0.4	-0.2
2010	-0.8	0.0	-0.9	-1.6	0.0	-0.5	0.4	0.6	0.0	0.2
2011	-1.8	0.0	-1.3	-2.5	0.4	-0.8	0.6	0.9	-0.3	0.3

Source: Authors' calculations using the results of the simulations

Table 11: Differences in variation of prices of factors, crisis vs. reference scenarios (% points)

	Capital	Labour	Formal Labour				Informal labour			
			Total	Rural	Qualified	Non qualified	Total	Rural	Qualified	Non qualified
					urban	urban			urban	urban
2009	-1.0	-4.9	0.0	0.0	0.0	0.0	-7.0	-8.2	-5.3	-4.0
2010	-2.1	-7.9	0.0	0.0	0.0	0.0	-11.3	-12.6	-8.9	-8.9
2011	-1.1	-7.4	0.0	0.0	0.0	0.0	-10.5	-11.4	-7.6	-10.1

Source: Authors' calculations using the results of the simulations

- *Effects on remittances*

Private remittances suffer a decline of 11.6% in 2009 and 2010 with respect to the no-crisis scenario before moving to a smaller decline of 9.7% in 2011.

3.2.3. Effects of the crisis on child welfare

We consider all individuals under the age of 15 as children. Defined as such, they are nearly half of the population of Burkina Faso (46% in 2006). In the following sections, we present the effects of the financial crisis on monetary and caloric poverty, education, labour and access to health care services for children as per the simulations. In each case, the initial situation and reference scenario (no-crisis) are presented before the analysis. The changes caused by the crisis are evaluated with respect to the reference scenario. The base year for the micro analysis is 2003, the year of the most recent household survey, the data used for the micro analysis.

i. *Effects on monetary poverty among children*

- *Initial situation*

The initial (base) situation of monetary poverty among children (0-14 years old) is based on the 2003 survey. This survey indicates that 32.7% of children across Burkina Faso are poor, with 36.1% of rural children and 12.3% of urban children living in poverty (table 12).⁵ This rate increases with the number of children in the family. We also see a higher proportion of poor children in households headed by men (32.8%) than those led by women (30.2%). Substantial disparity in the incidence of monetary poverty among children exists between different areas of the country, ranging from 19.7% in the Centre region to

⁵ Note that our analysis differs from the official statistics by adopting an equivalence scale based on individual caloric needs, whereas the official statistics are presented on a per capita basis. As such, our results are not directly comparable to the official figures.

45.6% in the North region. The relatively good performance for the Centre can be explained by the influence of the city of Ouagadougou. The regions with a high incidence of child poverty (the North at 45.6%, as well as the Centre-East and Centre-South at 44.8%) are agricultural regions with natural constraints marked by low rainfall, degraded soils and low fertility.

Table 12: Monetary poverty among children (0-14 years old) without the crisis

	Share (%) of the total population of children	Incidence of poverty (%)			
		Base year (%)	Reference scenario: variation in percentage points with respect to the base year		
			2009	2010	2011
Burkina Faso	100.0	32.7	0.6	0.1	-0.3
Regions					
Centre	8.1	19.7	1.0	0.8	0.5
Nord	9.2	45.6	0.4	0.5	0.6
Centre Ouest	8.8	23.9	0.1	0.1	0.1
Centre Est/Centre Sud	12.6	44.8	0.3	-0.7	-1.0
Est	9.3	36.3	0.4	0.4	0.5
Sahel	5.8	28.8	0.3	-1.8	-3.2
Sud Ouest	5.3	28.9	1.4	0.7	0.1
Boucle du Mouhoun	12.7	37.5	0.4	0.4	0.4
Hauts Bassins/Cascades	13.6	21.1	1.1	0.6	0.0
Centre Nord/Plateau central	14.6	33.7	0.9	0.1	-0.9
Gender of household head					
Female	4.8	30.2	0.2	-0.1	0.2
Male	95.2	32.8	0.7	0.2	-0.3
No. of children in the household					
2 children	0.3	11.8	0.7	0.7	0.7
3 children	3.4	12.5	0.4	0.3	-0.4
4 children	6.7	14.1	0.5	0.5	0.4
5 children	9.4	20.1	0.5	0.0	-0.4
6 children	10.8	24.3	0.5	0.1	-0.4
7 or more children	69.3	38.6	0.7	0.1	-0.2
Rural/Urban					
Rural	85.5	36.1	0.7	0.1	-0.3
Urban	14.5	12.3	0.5	0.5	0.3

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

- *Reference scenario*

In the absence of the crisis, our reference scenario indicates that the situation in 2009, 2010 and 2011 would have evolved as shown in table 13. For Burkina Faso as a whole, the incidence of monetary poverty among children would have declined from 32.7% to 32.4% in 2011, a reduction of 0.3 percentage points. However, we note slight increases in 2009 and 2010. A declining trend is only observed in three regions in 2011, as opposed to increases in the other regions. The decline is concentrated among children in rural regions and in households led by men.

- *Effects of the crisis*

For Burkina Faso as a whole, our simulations indicate that the economic crisis leads to a significant increase in the incidence of monetary poverty among children (table 13). The increases in the incidence of poverty, in percentage points relative to the initial situation, are 3.8 in 2009, 4.7 in 2010 and 4.4 in 2011. These results suggest that the crisis has immediate and strongly negative effects on children and that the situation is most grave in 2010. Similar changes are expected for children in all household categories, with some variation in the size of the impact. Rural children are most affected by the crisis,

while the impact continues to be felt in urban areas until 2011. The most affected regions are Sud Ouest, Sahel and Centre Nord/Plateau Central, followed by Hauts Bassins/Cascades, which are all above the national average. The least affected region is Centre.

Generally speaking, these results reflect the drop in income in the rural sector, where the decline in sales is nearly twice the value of self production (see Cockburn, Fofana and Tiberti, 2010). This channel of the impact is followed by the loss of buying power, then the increase in consumption prices and the reduction in remittances. The change in income in self employment in the non agricultural sector, which only covers 1% of rural households, does not contribute to changes in child poverty.

Table 13: Changes in monetary poverty among children (0-14 years old) due to the crisis (variation in % points with respect to the base year)

	Share (%) of the total population of children	Incidence of poverty (%)			
		Base year (%)	Crisis scenario: variation in percentage points with respect to the base year		
			2009	2010	2011
Burkina Faso	100.0	32.7	3.8	4.7	4.4
Regions					
Centre	8.1	19.7	1.7	2.3	2.0
Nord	9.2	45.6	2.5	3.2	3.2
Centre Ouest	8.8	23.9	2.7	3.6	3.9
Centre Est/Centre Sud	12.6	44.8	4.3	4.9	4.2
Est	9.3	36.3	2.5	2.5	2.5
Sahel	5.8	28.8	6.7	7.4	6.1
Sud Ouest	5.3	28.9	5.5	7.2	6.7
Boucle du Mouhoun	12.7	37.5	2.8	3.8	4.0
Hauts Bassins/Cascades	13.6	21.1	3.7	4.6	5.0
Centre Nord/Plateau central	14.6	33.7	6.1	7.6	6.3
Gender of household head					
Female	4.8	30.2	2.1	4.3	4.0
Male	95.2	32.8	3.9	4.7	4.4
No. of children in the household					
2 children	0.3	11.8	0.7	0.7	0.7
3 children	3.4	12.5	3.2	3.5	3.1
4 children	6.7	14.1	3.2	3.6	3.4
5 children	9.4	20.1	2.9	3.6	3.2
6 children	10.8	24.3	4.6	5.5	4.9
7 or more children	69.3	38.6	3.9	4.9	4.6
Rural/Urban					
Rural	85.5	36.1	4.1	5.1	4.7
Urban	14.5	12.3	1.8	2.4	2.7

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

ii. *The effects on caloric poverty among children*

- *Initial situation*

The results (table 14) show higher levels of caloric poverty than monetary poverty (table 13). The initial situation is that 64.9% of children (0-14 years old) across Burkina Faso live in caloric poverty. Note that caloric poverty is evaluated by comparing individual's caloric consumption to their minimum caloric needs (as described in the methodological section), all expressed in male-adult equivalents for the

purpose of comparison. We suspect that this figure is overestimated due to the fact that prices, used to convert the value of food consumption into quantities, are themselves overestimated. That having been said, the profiles of the *variation* in caloric poverty, our primary target, should not be significantly affected.

- *Reference scenario*

According to the reference scenario (no crisis), caloric poverty would have continued to climb due to the fact that prices of foodstuffs would have increased faster than those of non-food products. Indeed, the prices of non-food products are more influenced by imports, the prices of which are presumed stagnant during the reference period.

Table 14: Caloric poverty among children (0-14 years old) in the base year, crisis vs. reference scenario

Scenario	Incidence of caloric poverty (%)		Variation in percentage points with respect to the base year	
Base year (%)	64.9			
	Reference	Crisis	Reference	Crisis
2009	64.9	65.1	0.0	0.2
2010	65.5	65.0	0.6	0.1
2011	65.8	65.4	0.9	0.5

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

- *Effects of the crisis*

As with monetary poverty, the financial crisis leads to an increase in the incidence of caloric poverty among children for Burkina Faso as a whole (table 14). The increases in the incidence of poverty in percentage points with respect to the initial situation are 0.2 in 2009, 0.1 in 2010 and 0.5 in 2011. As of 2010, the increase in caloric poverty in the crisis scenario is less than in the absence of a crisis. The result can be explained by the fact that prices of foodstuffs decline relative to prices of non-food goods in the crisis scenario. The increase in caloric poverty is therefore less than for monetary poverty.⁶

iii. The effects on education and child labour

- *Initial situation*

The proportions of children aged 7 to 14 who go to school and/or are engaged in any economic activity in the base year are shown in table 15. It is important to emphasize that the age group targeted by the present study (7-14 years old) straddles the official age groups for calculating the school enrolment rate in Burkina Faso. Official education statistics are based on the 7-12 age group for primary school and 13 to 18 for secondary school. The values given in table 15 thus fall between official school enrolment statistics for primary and secondary schools.

In the 7-10 age group, 34.3% of children go to school. This rate includes 33.4% who go to school and don't work and 0.9% who both work and go to school. Of the 65.7% of children aged 7-10 who do not go to school, 42.9% work and 22.8% are classified as not working. In other words, 65% of children aged 7-10 who do not go to school participate in economic activities. Looking at 7-10 year old children as a whole, we find that 43.8% of children are engaged in some form of economic activity regardless of

⁶ This difference can also be explained by a larger concentration of children near the monetary rather than caloric poverty line.

whether or not they are enrolled in school. This rate includes 42.9% who are not in school and 0.9% who combine work and school. In other words, 98% of children aged 7-10 who work are not in school.

Among children aged 11-14, school enrolment rates are even lower, and participation in the labour force is even higher. Overall, 33.4% of these children go to school, of which 32.4% only go to school while 1% also work. The 66.7% of children aged 11-14 who do not go to school includes 55.2% who work and 11.5% who are “inactive”. Considering this age group as a whole, 56.2% of them are engaged in some economic activity whether or not they are in school. This rate includes 55.2% who are not in school and 1% who combine work and school. In other words, 98% of children aged 11-14 who work do not go to school.

Table 15: Schooling and labour among children aged 7-14, before and after crisis.

Scenario	School/no work	School/work	No school/work	No school/no work	School	Work
Children aged 7-10						
Base Year (%)	33.4	0.9	42.9	22.8	34.3	43.8
Variation relative to the base year in percentage points						
Reference 2009	-0.125	-0.002	0.151	-0.024	-0.127	0.149
Reference 2010	-0.044	0.001	0.030	0.013	-0.043	0.031
Reference 2011	-0.011	0.001	-0.023	0.033	-0.010	-0.022
Crisis 2009	-0.586	-0.001	0.858	-0.271	-0.587	0.857
Crisis 2010	-0.752	0.000	1.112	-0.360	-0.752	1.113
Crisis 2011	-0.710	0.002	1.007	-0.299	-0.708	1.009
Children aged 11-14						
Base Year (%)	32.4	1.0	55.2	11.5	33.4	56.2
Variation relative to the base year in percentage points						
Reference 2009	-0.106	0.004	0.124	-0.022	-0.102	0.128
Reference 2010	-0.053	0.003	0.046	0.004	-0.050	0.048
Reference 2011	-0.018	0.001	-0.005	0.021	-0.016	-0.003
Crisis 2009	-0.505	0.014	0.679	-0.189	-0.491	0.693
Crisis 2010	-0.658	0.018	0.874	-0.235	-0.640	0.893
Crisis 2011	-0.618	0.018	0.799	-0.199	-0.600	0.817

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

Overall, we see extremely low rates of participation in education and disturbingly high levels of participation in labour, which would be even higher if domestic work were taken into account. However, it should be emphasized that these rates are calculated using data from the 2003 survey which serves as the basis for our microeconomic analysis. As such, they do not take into account the government's considerable effort to increase school participation between the year of the survey (2003) and the base year (2008). The third MICS survey (sponsored by UNICEF) from 2006 shows that the rate of attendance in primary school increased to 46%. Even if this rate is not perfectly comparable with that presented in this study, we should certainly recognize the trend of increasing school attendance since 2003. However, this difference should not affect our simulations of the *variations* in school and labour participation, which are our main interest in the following sections.

- *Reference scenario*

According to our simulations, the changes between 2009 and 2011, in the absence of a crisis, would have been characterized by an increase in labour participation among children with respect to the base year for

both age groups, with the exception of 2011, when a reduction in labour participation compared with the base year is simulated. These changes are fairly small, all being less than 1 percentage point. This result is in line with the change in monetary poverty. These dimensions are effectively linked since, as presented in the methodological section, the change in demand for education depends solely on changes in households' real consumption. The model does not account for the impact of variations in public expenditures on education or other socio-economic variables at the level of individuals/households or communities.

- *Effects of the crisis on school enrolment and labour participation among children*

The principal effect of the world crisis is to deepen or exacerbate the negative trends observed in the reference scenario with a reduction in school enrolment and an increase in child labour (table 15). This result can be explained by the decline in real household income. It is nonetheless important to note that the declines in school enrolment rate and the increases in labour participation rate are both less than one percentage point with respect to the base year.

The principal difference between the two age groups is that the crisis leads to a slight increase in the rate of those who both work and go to school in the 11-14 age group. School-going children in this group contribute to income creation in order to mitigate the effects of the crisis. For both age groups, lower school attendance is almost exclusively concentrated among children who neither work nor go to school. It follows that the higher number of working children comes primarily from those who were exclusively in school rather than those who were inactive.

iv. The crisis and children's access to health care services

- *Initial situation*

The initial situation for health care is that 67.7% (table 16), or two in three sick children consult some sort of health care service. Overall, 84.6% of consultations by sick children are in public or private health centres, as opposed to 15.4% with traditional healers and others. The majority (55.0%) of these consultations in authorized health centres are in a Health and Social Promotion Centre (CSPS), which are most widespread and geographically close to the population. Consultations at private centres account only for 11.6% of visits by sick children.

- *Reference scenario*

In the absence of the crisis, our simulations indicate that medical consultations between 2009 and 2011 are expected to decline and also see substitution towards traditional healers, a result which is in line with the change in monetary poverty. These impacts decline over the simulation period.

Table 16: Medical consultations among sick children aged 0-14, before and after crisis

Scenario	Medical consultation among sick children	Health services consulted			
		National hospital centre, regional hospital centre, CMA/CM	Private doctor/pharmacy, private nurse, private/NGO	CSPS	Trad/marabou healers, traditional midwives, others
Base year (%)	67.1	18.0	11.6	55.0	15.4
	Variation in percentage points with respect to the base year				
Reference 2009	-0.217	-0.053	-0.057	-0.128	0.238
Reference 2010	-0.128	-0.046	-0.046	-0.073	0.165
Reference 2011	-0.077	-0.043	-0.039	-0.043	0.125
Crisis 2009	-1.001	-0.115	-0.152	-0.706	0.973
Crisis 2010	-1.221	-0.138	-0.199	-0.849	1.186
Crisis 2011	-1.009	-0.127	-0.182	-0.658	0.967

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

- *Effects of the crisis on children's access to health care services*

The principal effect of the crisis is to aggravate or exacerbate the trends observed in the reference scenario. With the crisis, consultations with public or private modern health care services by sick children between the age of 0 and 14 are all forecast to decline over 2009 to 2011, while consultations with traditional healers and marabouts are forecast to increase. This situation peaks in 2010 and falls back slightly in 2011. The decline in real household income due to the crisis reduces the capacity of households to deal with the cost of health care services. Demand for modern health care services declines, while less costly traditional practitioners (healers and marabouts) are consulted more frequently. According to our simulations, the overall consultation rate decreases by 1.2 percentage points in 2010. The CSPS see the greatest reductions (by 0.85 percentage points), followed by private clinics and hospitals, while the use of traditional health services increases by up to 1.2 percentage points in 2010.

4 POLICY RESPONSES TO THE ECONOMIC CRISIS

This study investigates the effects of the global financial and economic crisis on child welfare in Burkina Faso. It also highlights the implications of various policy response strategies that the state may use.

In the baseline and crisis scenarios described above, we postulate fixed public expenditures due to the short term nature of the analysis. Current public expenditures and investment per capita are therefore exogenous, which implies that growth in total annual expenditures is equal to the rate of demographic growth in Burkina Faso (3.1%). The state also faces falling tax revenues and foreign development aid, which leads to a growing deficit. With the goal of reducing or eliminating the negative effects that lower access to financing has on economic performance and the population's welfare, the state can adopt a number of strategies. These can be grouped into pro-cyclical and counter-cyclical strategies.

When the government is faced with a growing budget deficit, a reduction in expenditures (current or investment) and/or an increase in taxes are necessary to balance the budget. This response is considered as pro-cyclical. Its effect on economic performance and poverty reduction are negative because it

increases the economy's vulnerability to external shock. A reduction in expenditures would affect poor individuals and households more because they rely more heavily on public services. The impact of an increase in taxes would depend on how they are applied, with income taxes generally being progressive and sales taxes generally being regressive. Given that actually implementing pro-cyclical policies in Burkina Faso is out of the question, our analysis will not consider this type of policy response.

In a period of crisis and when the financing conditions allow it, the state should adopt a counter-cyclical policy response in order to stimulate the economy. This can involve an increase in public expenditures and/or a reduction in taxes on external financing. The effects of the policy response on economic growth and poverty reduction are directly related to the nature of the stimulus (investment expenditures, consumption spending, income support, etc.). Our analysis tests the effects of five counter-cyclical policies which target children in response to the economic crisis. Specifically, we analyze the impact of a food subsidy policy and a cash transfer to households/children with either domestic or external financing.

First, in order to stimulate the debate on the role of international aid, we analyze the possibility that the state of Burkina Faso has access to additional external financing equivalent to 1% of its 2008 GDP. We investigate the impacts of using these external resources to finance a subsidy policy for foodstuffs (**Subv_alim_1%**) and a policy of cash transfers targeting children (**Transf_1%**). We distinguish two sub-scenarios in the microeconomic analysis, one targeting poor⁷ children aged 0-14 (**Transf_1%a**) the other giving the transfer to all children aged 0-5 (**Transf_1%b**). By distributing the budget of 1% of GDP among the targeted children, the annual amount of the transfer is 8,628 CFA per child for the first sub-scenario and 11,200 CFA per child in the second case. The difference in the two numbers is due to the fact that the total number of children aged 0-5 is less than the number of children who are under the age of 14 and are predicted as poor. The distinction between the two transfer approaches is simply illustrative, so the simulations for the universal approach are only shown for monetary poverty.

Burkina Faso's 2009 priority action plan to counter the effects of the crisis included the goal of ensuring food security by subsidizing *cereal products* to the tune of 0.2% of GDP with external financing (**Subv_cér_.2%**).

The effects of the economic crisis on Burkina Faso were exacerbated by the floods of August-September 2009. In the emergency, the State sought to cover the cost of damages and to relocate and feed thousands of victims from the Centre and Mouhoun regions (the regions most affected by the floods). We simulate a monetary transfer equivalent to 0.4% of GDP, an estimate of the cost of the damages, for children predicted as poor in the Centre and Mouhoun regions, either financed externally (**Transf_.4%_aide**) or domestically via an increase in import taxes on modern manufacturing products (**Transf_.4%_taxe**). The annual amount of the transfer is equal to 15,900 CFA per child in each case.

For both cash transfer scenarios, we hold the assumption that the transfer is shared equitably (i.e., proportional to their caloric needs) with all members in the household even if the transfer only targets children. As such, our results can be considered as an intermediary bound since the children could benefit more from policies which specifically target them.

⁷ The state of poverty among children was predicted using estimates of the coefficients from the proxy-means model described in section 2.3.

4.1 Macroeconomic effects

Response policies that are counter-cyclical increase economic activity (table 17) in all scenarios, with growth driven by higher income (for the transfers scenarios, we do not distinguish between the targeted and universal transfers at the macro level), or through lower consumption prices (for the subsidy scenarios). The first and second simulations result in lower investment. The differences in growth are proportional to the budget specified in the scenarios with external financing, although we find that the transfers are somewhat more efficient than the subsidies. Since it doesn't involve external funds, the scenario financed with an import tax is the least stimulating for the economy.

Table 17: Difference in GDP growth by policy response (%)

	Subv_alim_1%	Transf_1%	Subv_cér_.2%	Transf_.4%_aide	Transf_.4%_taxe
	Food subsidy	Cash transfer	Cereals subsidy	Cash transfer in two regions	Cash transfer in 2 regions
Budget for policy (% 2008 GDP)	1.0	1.0	0.2	0.4	0.4
Source of financing	External	External	External	External	Import taxes
2009	0.29	0.30	0.02	0.12	0.04
2010	0.33	0.36	0.03	0.13	0.03
2011	0.31	0.35	0.03	0.13	0.02

Source: Authors' calculations

An influx of external aid is expected to stimulate economic growth in the four scenarios via an increase in consumption and, in the case of the transfer policies, in investment (due to an increase in private savings). The impact is more or less in proportion to the amount of external aid. Even when the policy response is financed by import taxes, the transfers stimulate GDP. This growth results from an increase in factor remuneration in nearly all of the scenarios.

The relative growth in imports strengthens competition and lowers domestic prices, including consumer prices, in the first scenario. The decline in this last variable is beneficial to producers due to lower input costs and improved remuneration for productive factors.

Consumer prices are higher with the subsidy, as is the level of remuneration for factors, which definitely provides a greater contribution to the population's welfare than in the cash transfer scenario.

4.2 Analysis of the effects on children of crisis response policies

i. Monetary poverty among children

The results of the five options for policy responses, in terms of variation (in percentage points) of the incidence of monetary poverty among children with respect to the initial situation are given in table 18.

The preceding sections have shown that the financial crisis leads to an increase in monetary poverty among children for Burkina Faso as a whole over 2009-2011. Only one of the simulated policies totally eliminates the negative effects of the crisis, to move in line with the no-crisis reference scenario (BaU). This policy is the cash transfer to households with children predicted as poor, with a total program budget equal to 1% of GDP in 2008 and financed by external aid (Transf_1%a) (table 18). The second best option is the universal transfer distributed to all households with children aged 0 to 5 (Cf. Transf_1%b).

Even though the amount of the transfer per child is greater (11,200 CFA vs. 8,628 CFA), the overall effect on monetary poverty among children aged 0 to 14 is somewhat lower due to the fact that many of the children targeted by this policy are not actually poor (about two-thirds). However, the impact on children aged 0 to 5 would clearly be better in this scenario. Moreover, implementation of the universal policy would be easier due to Burkina Faso's present institutional weakness (in logistical and administrative terms), as well as the fact that the country does not presently have a national transfer policy in place to facilitate implementation of the simulated policy of targeted cash transfers. In other words, a universal transfer policy (targeting a particular age group) is a relatively less complex policy variant to implement than the targeted transfer and could be beneficially adopted, at least during a transitional period.

A food subsidy policy (Subv_alim_1%) with a budget of 1% of GDP and financed by external aid is less effective at reducing monetary poverty among children. In general, it only mitigates half of the increase in child poverty expected as a result of the crisis. Indeed, this policy does not specifically target either children or the poor and does not include self-consumption, which can constitute an important (and sometimes primary) source of foodstuffs for the poor.

Cash transfers to families with poor children in the Centre and Mouhoun regions lead to reductions in monetary poverty similar to those brought about by the universal food subsidy regardless of the financing mechanism (Transf_.4%_aide and Transf_.4%_taxe). The impact on the incidence of monetary poverty in the Centre and Mouhoun regions is much stronger (table 19). Indeed, this annual individual transfer of 15,900 CFA allows poverty reduction of as much as 6.5% with respect to the base year in 2010 in Mouhoun. Generally speaking, financing the programme by external aid is somewhat preferable to an internal tax.

Only one of the five policies does not bring any improvement with respect to the crisis situation. This is the cereals food subsidy (with a budget equal to 0.2% of 2008 GDP financed by external aid). This can be explained by the small budget and, as for the 1% food subsidy, the fact that the subsidy does not specifically target poor children.

Table 18: Options for response policies to the crisis and monetary poverty among children aged 0-14

Scenario	Year	Incidence of poverty (P0) in %		Difference with respect to the base year (in percentage points)	
		Centre	Mouhoun	Centre	Mouhoun
Base year		19.7	37.5		
Reference	2009	20.7	37.9	1.0	0.4
	2010	20.4	38.0	0.7	0.5
	2011	20.2	37.9	0.5	0.4
Crisis	2009	21.3	40.3	1.6	2.8
	2010	21.9	41.3	2.2	3.8
	2011	21.7	41.5	2.0	4.0
Subv_alim_1%	2009	18.1	31.0	-1.6	-6.5
	2010	19.9	31.8	0.2	-5.7
	2011	20.0	31.6	0.3	-5.9
Transf_1%a	2009	18.8	31.0	-0.9	-6.5
	2010	20.0	32.0	0.3	-5.5
	2011	20.1	31.8	0.4	-5.7

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

Table 19: Options for policy responses to the crisis and monetary poverty among children aged 0-14 in the Centre and Mouhoun regions

Scenario	Year	Incidence of poverty (P0) in %		Difference with respect to the base year (percentage points)	
		Centre	Mouhoun	Centre	Mouhoun
Base year		19.7	37.5		
Reference	2009	20.7	37.9	1.0	0.4
	2010	20.4	38.0	0.7	0.5
	2011	20.2	37.9	0.5	0.4
Crisis	2009	21.3	40.3	1.6	2.8
	2010	21.9	41.3	2.2	3.8
	2011	21.7	41.5	2.0	4.0
Transf_4%_aide	2009	18.1	31.0	-1.6	-6.5
	2010	19.9	31.8	0.2	-5.7
	2011	20.0	31.6	0.3	-5.9
Transf_4%_taxe	2009	18.8	31.0	-0.9	-6.5
	2010	20.0	32.0	0.3	-5.5
	2011	20.1	31.8	0.4	-5.7

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

ii. Caloric poverty among children

Our analysis of the impact of the crisis predicted that it would lead to an increase in caloric poverty across Burkina Faso over 2009-2011. The effects of the five response policies on the incidence of caloric poverty among children with respect to the initial situation are shown in table 20.

We find that all the scenarios not only lead to an elimination of the increase of caloric poverty, but even to reductions with respect to the base year. These reductions are substantial in some cases. Also, with the same budget of 1% of GDP financed by external aid, a cash transfer policy targeting poor children is more effective than the food subsidy. The first reduces the incidence of poverty by 1.5 to 1.8 percentage point with respect to the base year over 2009 to 2011.

Table 20: Options for policy responses to the crisis and caloric poverty among children

Scenario	Year	Incidence of caloric poverty (P0) in %	Difference with respect to the base year (variation in percentage points)
Base year		64.9	
Reference	2009	64.9	0.0
	2010	65.5	0.6
	2011	65.8	0.9
Crisis	2009	65.1	0.2
	2010	65.0	0.1
	2011	65.4	0.5
<i>Alternative policy responses to the crisis</i>			
<u>Subv alim 1%</u>	2009	64.2	-0.7
	2010	64.2	-0.7
	2011	64.7	-0.2
<u>Transf 1%a</u>	2009	63.1	-1.8
	2010	63.1	-1.8
	2011	63.4	-1.5
<u>Subv cér .2%</u>	2009	64.2	-0.7
	2010	64.3	-0.6
	2011	64.7	-0.2
<u>Transf .4% aide</u>	2009	63.8	-1.1
	2010	63.9	-1.0
	2011	64.4	-0.5
<u>Transf .4% taxe</u>	2009	63.9	-1.0
	2010	63.8	-1.1
	2011	64.3	-0.6

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

The cereals subsidy policy has a similar impact to the food subsidy with only one fifth of the budget. Indeed, cereals are the primary source of calories, especially for poor children.

The two final transfer policies, which are regionally specific, reduce caloric poverty regardless of their source of financing. These reductions are as high as 1.1% at the national level. The effects are dramatic in both target regions, especially in Mouhoun where the caloric poverty rate would decline by about 10 percentage points in 2010.

iii. Education and child labour

The expected dynamics of education and child labour in the no-crisis scenario are a small decline in school attendance between 2009 and 2011 with respect to the base year and an increase in child labour in

2009 and 2010, although this pulls back sufficiently in 2011 to sit at a lower level than in the base year (table 21). The main expected effect of the financial crisis is to aggravate this trend for children aged 7 to 14 via a larger reduction in school enrolment rates and an increase in the proportion of children participating in economic activities.

Again, the cash transfer is the most effective of the response policies analyzed in the study. However, even with a budget of 1% of GDP allocated to the transfer policy, the negative effects of the crisis are not entirely eliminated; the school enrolment rate still declines and participation in labour increases relative to the reference scenario. The gains that this policy brings in terms of school enrolment with respect to the reference scenario are entirely among children who go to school and do not work. The decline in schooling ranges from 0.6-0.7 percentage points in the crisis scenario (depending on which age group is being considered) and the policy holds this figure down to about 0.2 percentage points. This policy also reduces the increase in child labour from 0.8-1 percentage point to about 0.25 percentage points and benefits children regardless of whether or not they are in school. Generally speaking, the effects are smaller for children aged 11 to 14, although the trend is similar.

The two other transfer policies (which target specific regions) and the food subsidy policy all have a fairly similar and modest ability to counter the effects of the crisis. It is important to emphasize that the two transfer policies, costing 40% of the budget of the food subsidy, have much more beneficial effects in the targeted regions (Centre and Mouhoun). Finally, the cereals food subsidy actually exacerbates the impacts of the crisis. This possibly surprising result can be explained by its negligible effect on real household income in conjunction with appreciation of the real exchange rate caused by the entry of external aid.

Policies which provide education in order to reduce obvious structural rigidities (particularly in certain regions) have not been investigated in this study, but this would be an interesting area to study.

Table 21: Options for policy responses to the crisis, education and child labour

Scenario	Year	School/no work	School/work	No school/work	No school/no work	School	Work
Children aged 7-10							
Base year (%)		33.4	0.9	42.9	22.8	34.3	43.8
<i>Variation in percentage points with respect to the base year</i>							
Reference	2009	-0.125	-0.002	0.151	-0.024	-0.127	0.149
	2010	-0.044	0.001	0.030	0.013	-0.043	0.031
	2011	-0.011	0.001	-0.023	0.033	-0.010	-0.022
Crisis	2009	-0.586	-0.001	0.858	-0.271	-0.587	0.857
	2010	-0.752	0.000	1.112	-0.360	-0.752	1.113
	2011	-0.710	0.002	1.007	-0.299	-0.708	1.009
Subv_alim_1%	2009	-0.400	0.001	0.579	-0.180	-0.399	0.580
	2010	-0.584	0.001	0.854	-0.271	-0.583	0.855
	2011	-0.460	0.002	0.651	-0.193	-0.458	0.653
Transf_1%a	2009	-0.141	0.002	0.210	-0.071	-0.139	0.212
	2010	-0.302	0.002	0.438	-0.138	-0.300	0.440
	2011	-0.184	0.003	0.245	-0.064	-0.181	0.248
Subv_cér_.2%	2009	-0.599	-0.001	0.887	-0.286	-0.600	0.885
	2010	-0.762	-0.000	1.128	-0.366	-0.763	1.128
	2011	-0.719	0.001	1.021	-0.304	-0.718	1.023
Transf_.4%_aide	2009	-0.399	-0.003	0.615	-0.213	-0.402	0.612
	2010	-0.556	-0.000	0.841	-0.285	-0.556	0.841
	2011	-0.529	0.000	0.765	-0.237	-0.529	0.765
Transf_.4%_taxe	2009	-0.419	-0.000	0.647	-0.227	-0.420	0.647
	2010	-0.585	-0.001	0.891	-0.305	-0.586	0.891
	2011	-0.546	0.000	0.792	-0.246	-0.546	0.792
Children aged 11-14							
Base year (%)		32.4	1.0	55.2	11.5	33.4	56.2
<i>Variation in percentage points with respect to the base year</i>							
Reference	2009	-0.106	0.004	0.124	-0.022	-0.102	0.128
	2010	-0.053	0.003	0.046	0.004	-0.050	0.048
	2011	-0.018	0.001	-0.005	0.021	-0.016	-0.003
Crisis	2009	-0.505	0.014	0.679	-0.189	-0.491	0.693
	2010	-0.658	0.018	0.874	-0.235	-0.640	0.893
	2011	-0.618	0.018	0.799	-0.199	-0.600	0.817
Subv_alim_1%	2009	-0.350	0.010	0.466	-0.126	-0.340	0.476
	2010	-0.525	0.014	0.690	-0.180	-0.511	0.705
	2011	-0.426	0.012	0.540	-0.126	-0.414	0.552
Transf_1%a	2009	-0.166	0.003	0.207	-0.044	-0.163	0.210
	2010	-0.319	0.008	0.400	-0.089	-0.311	0.408
	2011	-0.225	0.006	0.255	-0.037	-0.219	0.261
Subv_cér_.2%	2009	-0.515	0.014	0.698	-0.197	-0.501	0.712
	2010	-0.665	0.018	0.885	-0.239	-0.647	0.904
	2011	-0.625	0.018	0.809	-0.202	-0.607	0.827
Transf_.4%_aide	2009	-0.358	0.009	0.490	-0.142	-0.349	0.500
	2010	-0.514	0.013	0.689	-0.189	-0.500	0.702
	2011	-0.479	0.013	0.625	-0.159	-0.466	0.638
Transf_.4%_taxe	2009	-0.382	0.009	0.526	-0.153	-0.372	0.535
	2010	-0.532	0.014	0.717	-0.199	-0.518	0.731
	2011	-0.493	0.014	0.645	-0.165	-0.480	0.658

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

iv. *Children's access to health care services*

In the absence of a crisis, a small reduction in the medical consultation rate among sick children and substitution towards traditional healers was expected during 2009-2011. These trends are expected to worsen with the crisis.

With the exception of the food subsidy, all the policies attenuate these effects without re-establishing the trends expected in the absence of the crisis. Again, the most effective policy is the cash transfer targeted to poor children (Transf_1%a). It reduces the increase in consultations with traditional healers and the corresponding decrease in consultations with modern services by more than half (table 22).

Table 22: Options for policy responses to the crisis and children's access to health care services

Options	Year	Health care consultation among sick children	Health service consulted			
			National hospital centre, regional hospital centre, CMA/CM	Private doctor/pharm., private nurse, private/NGO	CSPS	Traditional healer/marabout/midwives, Others
Base year (%)		67.1	18.0	11.6	55.0	15.4
<i>Variation in percentage points with respect to the base year</i>						
Reference	2009	-0.217	-0.053	-0.057	-0.128	0.238
	2010	-0.128	-0.046	-0.046	-0.073	0.165
	2011	-0.077	-0.043	-0.039	-0.043	0.125
Crisis	2009	-1.001	-0.115	-0.152	-0.706	0.973
	2010	-1.221	-0.138	-0.199	-0.849	1.186
	2011	-1.009	-0.127	-0.182	-0.658	0.967
Subv_alim_1%	2009	-0.579	-0.087	-0.109	-0.411	0.607
	2010	-0.845	-0.111	-0.157	-0.578	0.846
	2011	-0.650	-0.096	-0.122	-0.429	0.646
Transf_1%a	2009	-0.345	-0.062	-0.073	-0.284	0.419
	2010	-0.599	-0.084	-0.114	-0.430	0.627
	2011	-0.395	-0.070	-0.084	-0.290	0.444
Subv_cér_.2%	2009	-1.018	-0.117	-0.156	-0.721	0.994
	2010	-1.233	-0.139	-0.202	-0.859	1.199
	2011	-1.029	-0.128	-0.186	-0.674	0.988
Transf_.4%_aide	2009	-0.715	-0.084	-0.098	-0.510	0.693
	2010	-0.984	-0.111	-0.149	-0.734	0.994
	2011	-0.759	-0.099	-0.131	-0.533	0.763
Transf_.4%_taxe	2009	-0.791	-0.091	-0.106	-0.608	0.805
	2010	-1.007	-0.113	-0.153	-0.749	1.014
	2011	-0.794	-0.102	-0.136	-0.556	0.794

Source: Authors' calculations using estimates from the ECVM 2003 and the results of the simulations

With the same budget and also financed with external aid, the food subsidy has about half the effect. With a 2.5 times smaller budget, the cash transfers targeting the Centre and Mouhoun regions have smaller but non negligible effects, particularly when financed by external aid. Finally, the cereals subsidy, with a budget of only 0.2% of GDP, has almost no effect on children's access to health care services and could even make things worse (through its effects on the exchange rate).

5 CONCLUSIONS

The present study evaluates the potential effects of the economic crisis on monetary and caloric poverty, education, labour and access to health care services among Burkinabe children aged 0 to 14 and then analyzes a number of social policy options to counter these effects.

The economic crisis leads to an increase in the incidence of monetary and caloric poverty among children aged 0 to 14 in Burkina Faso over 2009 to 2011. According to our simulations, monetary poverty reaches its highest point in 2010 to sit 4.7 percentage points higher than in the initial situation. Children living in rural areas are the most affected, with a 5.1% increase. The crisis affects each region differently: the Sud Ouest, Sahel and Centre Nord/Plateau Central regions are the most affected, with increases as high as 7.6 percentage points, while the increases in the Centre and Est regions are at most 2.5 percentage points.

Caloric poverty is not as significantly affected by the crisis, with the highest increase being only 0.5 percentage points. This result can be explained by the expected reduction in the relative prices of foodstuffs which compensates for the decline in income. Indeed, foodstuffs are less affected by a depreciating real exchange rate than non food products which are more traded.

The dynamics of education and child labour for 7 to 14 year old children is characterized by a greater reduction in school enrolment rates of about 0.7 percentage points and a 1 percentage point increase in the proportion of children participating in economic activities. The structure of demand for health services by sick children is expected to change, with a 1 percentage point decline in the consultation rate and an increase in consultation with traditional healers and lower use of modern health care services.

Among the different response policies analyzed in this study, the most effective at countering the negative effects of the crisis and/or restoring the trends that would have been seen in the absence of a crisis is the cash transfer to poor children aged 0 to 14. With a total budget of 1% of 2008 GDP, the annual transfer is estimated at 8,628 CFA per child using 2003 demographic data. This policy response returns the trend for monetary poverty to pre-crisis level, lowers the trend for caloric poverty and is more effective at mitigating the negative effects of the crisis on school attendance, child labour and sick children's access to modern health care services.

The alternative of a universal transfer to children aged 0 to 5 – the most vulnerable age group – with the same budget gives similar results. This policy would be easier to implement for institutional (logistical and administrative) reasons, given that Burkina Faso does not actually have a transfer policy at the national level.

With the same budget of 1% of GDP, a food subsidy policy is much less effective at improving the various dimensions of child welfare that are affected by the crisis. This can be explained by the poor capacity of this policy to target children, particularly its limited ability to target the poor. Given that the non-poor and adults consume more than the poor or children (especially when looking at items which are sold on markets and are thus subject to indirect taxation), these groups benefit most from this policy. A variant analyzed in this study is the subsidy which only targets cereals, an important source of calories, particularly among the poor. With a budget of 0.2% of GDP, this policy appears to be much more efficient than the food subsidy in terms of reducing caloric poverty.

Finally, we analyzed a regional policy of a transfer targeting poor children living in the Centre and Mouhoun regions which were hit by the August-September 2009 floods. Two scenarios are envisioned according to whether or not this intervention is financed by external aid, as with the preceding policies, or by a tax on imports of modern manufactured goods. With a budget equal to 0.4% of GDP in 2008, a monetary transfer (15,900 CFA per child per year) to poor children in these two regions leads to large reductions in monetary and caloric poverty regardless of how it is financed. This policy would lead to a 6.5 percentage point reduction in poverty in Mouhoun with respect to the pre-crisis situation.

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ANNEX

Table 2: Targeting performance (in %)

Source: Calculated by the authors using estimates from the proxy-means (Annex Table 1)

	Predicted status	
	Non-poor	Poor
Real status		
	NATIONAL	
Non-poor	58.4	41.6
Poor	24.0	76.0
	URBAN	
Non-poor	75.3	24.7
Poor	20.2	79.8
	RURAL	
Non-poor	54.5	45.5
Poor	24.2	75.8

Table 1: Results of the "proxy-means" regression to identify poor individuals

	Urban	Rural
Region		
Hauts Bassins	0.000	0.000
Mouhoun	0.029 ***	-0.136 ***
Sahel	-0.010 ***	0.028 ***
Est	0.281 ***	-0.103 ***
Sud Ouest	-0.075 ***	0.050 ***
Centre Nord	0.123 ***	0.009 *
Centre Ouest	0.203 ***	0.047 ***
Plateau central	0.000	-0.218 ***
Nord	0.043 **	-0.263 ***
Centre Est	0.008 ***	-0.189 ***
Centre	0.036 ***	-0.341 ***
Cascades	-0.081 ***	-0.090 ***
Centre Sud	0.000	-0.360 ***
hh_age_sup14	-0.063 ***	-0.032 ***
hh_age_inf15	-0.053 ***	-0.035 ***
Subdivided (<i>Lotie</i>)	0.057 ***	0.000
Toilet	0.375 ***	1.121 ***
Floor	0.197 ***	0.210 ***
Wall	0.209 ***	0.085 ***
Roof	0.018 ***	0.021 ***
Electricity	0.298 ***	0.056 ***
Water	0.247 ***	0.311 ***
n_rooms	0.404 ***	0.278 ***
Car	0.354 ***	0.139 ***
Motorcycle	0.299 ***	0.295 ***
Distance	0.045 ***	0.044 ***
Constant	11.133 ***	11.453 ***
"cut-off point"	11.322	11.322

Source: Authors' calculations using estimates from the ECVM 2003

Notes:

- Dependent variable: Logarithm of food expenditures (per adult equivalent) divided by a deflator of regional prices
- Econometric model: regression by quintile fixed at 0.11 for urban areas and 0.30 for rural areas
- Significant coefficient at 1% (***), 5% (**) and 10% (*)
- Pseudo R² 0.35 for "urban"; 0.10 for "rural"
- The "cut-off" point is expressed as a logarithm and corresponds to 82,672 CFA, the official poverty line in 2003
- To identify poor individuals, multiply the variables for each household by their respective coefficients. If the total is less than 11.322 the household is considered as poor, and is otherwise considered as non-poor.

Key:

Region = binary variable for each region, from "Haut Bassins" (the reference region) to "Centre Sud"

hh_age_sup14 = number of household members aged 15 and over

hh_age_inf15 = number of household members aged 14 and under

lotie = binary variable equal to 1 if the household lives in a subdivided residence zone; 0 otherwise

toilet = binary variable equal to 1 if the household has a private flush toilet; 0 otherwise

floor = binary variable equal to 1 if the household lives in a house with a cement or tile floors; 0 otherwise

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

roof = binary variable equal to 1 if the household lives in a house with a cement or sheet metal; 0 otherwise

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

Water = binary variable equal to 1 if the household gets drinking water from own or shared tap; 0 otherwise

n_rooms = number of rooms per household member

car = binary variable equal to 1 if the household has a car; 0 otherwise

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

distance = binary variable equal to 1 if the household lives 15 minutes or less from public transportation; 0 otherwise