Trade and Employment in the Global Crisis

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International
Labour
Office
Geneva

Academic Foundation
New Delhi

First published in 2010 by

International Labour Office,
CH-1211 Geneva 22, Switzerland
www.ilo.org

in association with

Academic Foundation
(co-publication partners for South Asia)
4772/23 Bharat Ram Road, (23 Ansari Road), Darya Ganj,
New Delhi - 110002, India.
www.academicfoundation.com

Jansen, Marion; von Uexkull, Erik
Trade and employment in the global crisis
International Labour Office; Academic Foundation - Geneva: ILO, 2010
1 v.

ISBN 978-92-2-123334-3 (ILO); 978-81-7188-839-9 (Academic Foundation)

trade / employment / unemployment / economic recession / developing countries

09.05.1

ILO Cataloguing in Publication Data

Designed and typeset by Italics India, New Delhi
Cover design copyright: Academic Foundation
Printed and bound in India

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Preface

The financial crisis that emerged in the US housing market in 2008 quickly spread around the world to become a truly global economic crisis. While we are seeing output recover around the world, lessons from previous crises tell us that employment is slow to pick up. As a consequence, many of those who lost their job during the crisis are still unemployed, not knowing whether and when their revenue will return to pre-crisis levels. In many cases, it also means that jobs needed for young people entering the labour force are not being created, adding to already high levels of youth unemployment. As this report shows, even workers who managed to keep their jobs during the crisis often suffered severe losses in their incomes as real wages declined.

The ILO responded to the crisis through the Global Jobs Pact, adopted unanimously by workers', employers' and government representatives of its member countries during the International Labour Conference in June 2009. Under this framework, based on the ILO's Decent Work Agenda, the ILO has provided technical assistance to its member governments and social partners in addressing the impact of the crisis through policies that focus on restoration of employment and extension of social protection while preventing the erosion of respect for workers' rights and promoting social dialogue. To take into account the specifics of each country, ILO undertook individual assessments of the impact of the crisis on employment in numerous member countries. This has generated useful country-level information on the transmission of the crisis—including, in particular, through the trade channel—and its impact on employment. This book undertakes the difficult and important task to bring some of those findings together and draw policy lessons that are relevant in dealing with the fallout of this crisis, and maybe even more so in preparing for the future.

Trade continuously emerged as an important transmission channel of the crisis in ILO country work, especially for developing countries that were relatively shielded from the initial shock to the financial system because of their low levels of financial integration. Many developing countries saw world market demand—and prices—for their export commodities decline severely, especially in comparison to the commodity price boom of 2007 and early 2008. The authors argue that this volatility may have lasting negative consequences through its impact on the investment decisions of households and companies and an erosion of the bargaining power of workers and governments.

The book contributes to our understanding of the trade shock at the global level, its transmission to national labour markets and its impact on households. It also deals with the question of what policies were most effective in mitigating the crisis and protecting workers against its impact. The authors conclude that a crucial factor for a country's ability to deal effectively with the crisis was whether policymakers could revert to existing mechanisms for social protection. They also argue that social dialogue can be a powerful tool in reaching an equitable burden-sharing, in particular in situations where governments do not have the ability to react to the crisis through fiscal expansion. Having these mechanisms in place is thus an important step for countries to be prepared for future crises. ILO is a strong advocate of such policies, and will continue to work with its constituents to strengthen them in the future.

— José Manuel Salazar-Xirinachs
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Acknowledgements

This book is a product of the ILO's work in response to the global economic crisis under the Global Jobs Pact. It was written by Marion Jansen and Erik von Uexkull of the ILO Employment Sector (Trade and Employment Programme), but benefited substantially from the work of many others. Thanks and credit are due to the authors of the underlying country studies. David Kucera was the lead author of the study on South Africa and India written jointly with Leanne Roncolato and Erik von Uexkull. Scott McDonald wrote the study on Brazil in cooperation with the authors of this book, and James Heintz led the work of a team of ILO staff in Liberia and was the main author of the resulting report. John Sender was the lead author of the study on Uganda together with Erik von Uexkull. Arne Klau wrote the background paper for the chapter on Egypt. The section on Ukraine is the result of an ongoing ILO project titled "Promoting Economic Diversity in Ukraine: The Role of the Business Enabling Environment, Skills Policies and Export Promotion." It was written by the authors of this book but benefited from data and comments provided by Yaroslav Zhalilo and Larysa Lisogor.

The book also benefited from valuable contributions from Michael Finger, who provided most of the information on trade and prices during the crisis presented in Section B2. Tuan Nguyen and Afshan Dar provided excellent research assistance for several sections of the book. Elisa Gamberoni contributed to the literature review on the transmission and employment impact of past crises. Julia Urhausen repeatedly provided EU trade data for several of the country studies and Erick Zedillo and Stefanie Garry provided the sectoral labour market data. Alana Albee inspired and coordinated the work on Uganda and Liberia.

Finally, the book was greatly improved thanks to comments received from three anonymous referees as well as Olivier Cattaneo, Ekkehard Ernst, David Lamotte, Mark Levin and Ralf Peters.

1 Introduction

This study was written in early 2010, when the world was beginning to recover from the biggest global economic and financial crisis since the Great Depression. The crisis started with a financial crisis in the United States, triggered by the bursting of a housing bubble. It rapidly affected economies with financial sectors that were highly integrated into the global financial system, in particular industrialized and transition economies in Europe. While the contagion effects of other financial crisis episodes in recent decades—such as the Asian crisis in 1997 or the Argentinean crisis in 2001—had to a large extent remained restricted to a particular region, this crisis rapidly spread across continents and turned into a truly global recession of the real economy.

In highly integrated markets characterized by global supply chains, consumption decisions in one country not only affect jobs at home but also abroad. US consumers' decision to postpone the buying of cars therefore caused unemployment not only among workers in the American car industry but also in the Liberian rubber sector that generates the raw material for car tyres. While the cause of unemployment among American car technicians and Liberian rubber tappers may be the same, the effects on their livelihoods are likely to be very different. Most industrialized country workers who lost their jobs during the crisis benefit from income support for a certain amount of time. This is not the case for thousands of workers who, like the Liberian rubber tappers, lost their job in a developing country. The effects can be severe, and can last beyond the duration of the crisis if workers have to sell their homes, stop sending their children to school or decide to migrate in the hope to find work elsewhere.

This study provides insights into how the crisis has been transmitted from the industrialized world, where it started, to developing and transition economies, and how it has affected labour markets in these countries. It provides evidence on the extent of the labour market effects of the crisis

observed around the globe and on the role trade has played in causing these effects when compared with other transmission channels, such as foreign direct investment (FDI) or remittances. A flavour is given of the relevance of the trade-employment linkage at the global level, but the study provides above all a rich body of evidence based on six in-depth country-level studies conducted in the second half of 2009. The studies cover seven countries: two low-income countries (Liberia and Uganda), three lower middle income countries (Egypt, India and Ukraine) and two upper middle income countries (Brazil and South Africa).

The country-level findings illustrate how the employment impacts of trade shocks have differed across countries. They provide evidence on the aggregate employment effects of trade shocks, and also on how employment effects have differed across types of workers. Some studies report findings on the secondary effects of trade shocks; that is, those not created in the trading sectors themselves but through consumption or production decisions triggered by revenue losses in the trading sectors. Readers will find evidence in these studies on changes in bargaining power triggered by the crisis and qualitative and quantitative evidence on how trade shocks have affected investment decisions during the crisis. With respect to the latter, the information provided on household coping strategies illustrates how temporary shocks can have long-term negative effects on growth because of their influence on household decisions concerning issues such as migration and education. Overall, the discussion of the seven countries' experiences will provide readers with a broad but at the same time detailed overview of the multitude of employment-related effects triggered by trade shocks during crisis episodes.

The methodologies chosen for the different country cases discussed here were determined by the desire to finalize the assessments within a relative short time frame in order for the studies to contribute to policy design during the crisis. For Brazil, India and South Africa it was possible to use detailed datasets and tailored models that had already been designed before the crisis to evaluate the employment effects of changes in trade flows or trade policy. With the use of such tools it is possible to analyze not only how the crisis directly affected export sectors, but also how this effect spilled over to other sectors of the domestic economy. These tools also make it possible to examine effects on different aggregates of the economy,

such as different types of households, production factors, economic sectors or geographical regions. In addition, it is possible to discern relative effects; for example, to evaluate how one type of household or one type of production factor has fared with respect to others during the crisis.

In Egypt, Liberia, Uganda and Ukraine, assessments have been guided by the methodology set out in the ILO's guide on country-level impact assessment (ILO, 2009a). This methodology combines desktop analytical work on the basis of available data with field-level research to collect missing pieces of information. The latter typically took the form of focus group discussions with main stakeholders (in particular, workers and employers) that provided useful micro-level information, in particular on household-level effects of the crisis and coping strategies. Special attention was paid to the sectors most affected by the economic crisis, and in some cases special reports on specific sectors were commissioned. While the rapid country-level assessments may not stand up to academic scrutiny and are often only able to depict a partial picture of what happened in the economy, they are valuable because of the wealth of micro-level information they provide. Because they are not restricted by the standard set of behavioural assumptions that characterize the typical off-the-shelf empirical or simulation models, they can also delve into questions that cannot be analyzed with models.

By the nature of the country-level work on which it is based, this study provides useful insights to policymakers with regard to methodologies that can be used to assess rapidly the labour market impacts of economic shocks. The study's main aim, though, is to enhance the understanding on how trade shocks affect employment, and thus to provide guidance on crisis mitigation policies. With this objective in mind, the study is structured in the following way: Chapter 2 reviews the available evidence on global and regional patterns in trade and employment, as well as the role of different types of macroeconomic exposure in the transmission of the crisis. In Chapter 3, the country-level evidence is summarized along a number of themes that emerged as salient features of the particular country experience regarding the trade and employment linkages in the crisis. These themes are the role of export concentration (Ukraine), the interaction of the global economic crisis with the previous hikes in food and commodity prices (Uganda and Liberia), transmission of the trade shock through the

economy via secondary effects (South Africa and India) and the impact of the trade shock on income distribution (Brazil) and gender disparities (Egypt). Chapter 4 analyzes the trade and employment impacts of different types of policies that have been used during the crisis.

The conclusions presented in Chapter 5 propose a framework for crisis-intervention policies that are consistent with the observed patterns of crisis transmission through trade. It also represents an attempt to reconcile the obligations of the multilateral trade system under the World Trade Organization (WTO) with the agenda of the Global Jobs Pact proposed by the International Labour Office in response to the crisis. As such, this study represents one additional step in the direction of more coherence between trade and labour market policies.

At the time of writing this study there are signs that the world has started to recover from the global crisis. With respect to the current crisis, the policy advice described may therefore be most useful for decisions on which policies should be kept in place during the final phases of the crisis. But this study also contains a strong policy message for the future. With the levels of global financial and trade openness achieved—and maintained during the crisis—individual economies will continue to be vulnerable to external shocks. The debate on whether global volatility has increased may be unresolved, but there is a real chance that external shocks will become more frequent. It is therefore of crucial importance to prepare economies for this during the phase of economic growth that is hopefully (but not surely) about to start.

2 Trade flows and labour markets during the crisis

What global data tells us

2.1 Trade, employment and transmission of economic crises

Over the past decades trade has played an increasingly important role in the world economy and has contributed significantly to economic growth, both at the global level and within individual countries. Many people have benefitted from trade through increases in wages and household incomes, and this has in particular been the case for those involved in export-related activities. Being connected to the world economy may not give any guarantee for economic growth, but there have not been many examples—if any at all—of countries that managed to significantly enhance their growth performance while staying disconnected from global production and financial networks.

At the same time, however, trade—like financial openness—exposes countries to external shocks; that is, to economic downturns created elsewhere.[1] Already in the 1990s (Rodrik, 1998) highlighted the stylized fact that "open economies have bigger governments" in order to protect the domestic population against the negative consequences of exposure to external fluctuations. A better understanding of how fluctuations are transmitted from country to country will help policy-makers to design appropriate policies.

The focus of most of the literature on international transmission of fluctuations is on currency and banking crises. For example, Glick and Rose (1999) analyze how past currency crises have spread and why they were usually concentrated in a specific region. They find that trade linkages are the main explanation, much more so than financial or macroeconomic linkages. They thus confirm the findings of Eichengreen *et al.* (1996), who

find evidence on contagion of currency crises through trade links rather than macroeconomic similarities. Kaminsky and Reinhart (2000) find that trade links and common creditors help to explain historical patterns of contagion, but also emphasize the emerging importance of "new" financial channels, such as mutual funds and cross-market hedges. Sachs *et al.* (1996) analyze the fallout of the Mexican currency crisis in 1995 and argue that the degree to which other emerging markets were affected could be explained mainly by three common characteristics: a high real exchange rate appreciation, a recent lending boom and low reserves.

A simple regression using data from the current crisis illustrates that similar mechanisms are likely to have played a role during the current crisis.[2] When regressing the change in GDP growth between 2009 and the average of the pre-crisis years 2005-2007 on a number of possible crisis transmission channels, short-term debt turns out to be statistically significant at a 1 per cent level of confidence. The same is true when the dependent variable is unemployment. The results presented in Table 2.1 also show that a higher ratio of merchandise exports to GDP was associated with a stronger GDP contraction and a stronger increase in unemployment, although the latter is not significant at a 10 per cent confidence level.[3]

The few studies that have already ventured to explain the transmission of the current global economic crisis also emphasize the role of trade. For example, Baldwin (2009) argues that the initial transmission mechanism was expectations of economic agents that led to the simultaneous decline in economic activity across the globe. In the face of growing uncertainty in the US financial sector in the third quarter of 2008 (triggered by the collapse of Lehman Brothers), consumers, firms and investors adopted a "wait and see" approach to consumption and investment decisions—that is, a postponement in purchases of consumer durables and investment goods. Trade played a crucial role in this; the adverse demand shock that reduced incomes in the United States led to a decline in demand for foreign goods, resulting in shrinking exports from their trading partners. Similarly, as countries around the world saw global demand for their goods dropping, their incomes declined and they imported less. The impact was an overall reduction in trade, further depressing world output and perpetuating the global recession. Escaith *et al.* (2010) highlight the roles of vertical linkages in production processes and income elasticity

Table 2.1

OLS regression results for crisis impact versus exposure to potential transmission channels

	(1) GDP growth: 2009–average 2005–07	(2) Unemployment rate: 2009–07
Merchandise trade / GDP in 2007	**-0.032** (0.089)+	**0.014** (0.210)
Services trade / GDP in 2007	**0.162** (0.001)**	**-0.089** (0.026)*
Inflow of remittances / GDP in 2007	**0.029** (0.680)	**0.082** (0.285)
Aid inflows / GNI in 2007	**-0.049** (0.649)	**0.013** (0.935)
Stock of foreign direct investment / GDP in 2007	**0.015** (0.584)	**0.010** (0.561)
Short-term debt / (exports + income) in 2007	**-0.095** (0.004)**	**0.062** (0.001)**
ln of population size	**0.598** (0.180)	**-0.080** (0.787)
ln of per capita GDP (US$)	**-2.546** (0.002)**	**-0.059** (0.923)
Constant	**3.694** (0.752)	**1.097** (0.902)
Observations	**84**	**43**
R-squared	**0.454**	**0.370**

Note: p values in parentheses: + significant at 10%; * significant at 5%; ** significant at 1%.

Source: Regression results.

of trade in the severity and synchronicity of the trade collapse. The production and sale of a final tradable good can require the import of parts from abroad and the export of the final good. Therefore, the production chain of a good can cross many borders at various stages of production, and each of these stages depends on the other. Reduced demand for the final good, consequently, leads to declining demand for intermediate goods all along the supply chain. One consequence is that trade has become more volatile as the elasticity of world trade to GDP has increased from around 2 in the 1960s to 3, and that it is higher in turbulent times (Freund, 2009). Raw materials and fuel appear to be particularly strongly affected by this trend.

The next question of relevance for this study is how trade shocks are expected to affect labour markets, in particular in terms of employment

levels and income. With respect to the impact of crises on employment, Reinhart and Rogoff (2009) analyze a sample of 14 historical banking crises and find that, on average, unemployment peaked 7 percentage points above its pre-crisis level and the shock to the labour market lasted almost five years. For the United States, Knoteck and Terry (2009) find that unemployment after the last two recessions (1990/91 and 2001) continued to increase for 16 and 20 months respectively after the country moved out of recession. Furceri and Mourougane (2009) even argue that past crises in Organisation for Economic Co-operation and Development (OECD) countries raised the structural unemployment rate and thus had permanent effects. A potential explanation for this is provided by the concept of hysteresis, introduced by Blanchard and Summers (1986) and recently strongly supported by Ball (2009).

But focusing on the employment effects of financial crisis episodes may be misleading in the case of countries that were only hit by the real shock and whose financial sector was not affected. Trade shocks, for instance, may affect labour markets differently. Most empirical work on the employment effects of trade has analyzed the effects of a change in trade policy and thus a permanent change in trade flows. Changes in trade policy are likely to lead to increases in both job destruction and job creation and are often expected to have no or minimal net employment effects. The effects of a temporary trade shock may be different as there is an expectation that trade flows will return to their previous levels once the shock has passed. In this respect, the effects of a temporary negative trade shock are likely to be similar to the effects of a temporary appreciation in industry-specific exchange rates. Klein *et al.* (2003) find—based on US data—that changes in the cyclical component of exchange rate movements increase job destruction and leave job creation unaffected, thus leading to a decrease in net employment. The same phenomenon may occur as a result of a temporary negative trade shock.

The US labour market, on which the evidence in Klein *et al.* (2003) is based, is known for being very reactive to changes in economic activities. As a result, even a moderate drop in GDP can lead to a significant fall in employment and increased unemployment. However, this relationship between economic activity and official unemployment rates cannot be applied generally. Hoekman and Winters (2005) conclude from an overview

of the relevant literature that there is rather little evidence on a systematic relationship between changes in economic activity—caused by changes in trade policy—and changes in unemployment rates. This can be explained by the fact that a drop in the availability of jobs may have the effect that people stop actively looking for work and thus are not registered as unemployed (so-called "discouraged workers") or that they withdraw entirely from the labour force. In developing countries, characterized by a large informal sector, people may end up moving from formal to informal employment.[4] In most countries, it is hard to pick up such movements in official data. Last but not the least, a drop in economic activity might not lead to job destruction if workers agree to continue working at lower wages or if their wages are subsidized through policy interventions, such as the German *Kurzarbeit* scheme in the current crisis (ILO, 2009b).

The above analysis indicates that the employment impacts of a negative trade shock will be country-specific. The same is true for wage effects following the shock. In fact, adjustment mechanisms may even differ across sectors within the same country.[5] Economic theory, however, gives a hint as to where employment or wage effects, or a combination of both, should be expected to be largest in the absence of policy interventions. Traditional trade models based on the Heckscher-Ohlin model predict that countries specialize in sectors that intensively use the production factors abundant in those countries. Accordingly, a negative trade shock hitting export sectors is likely to affect most strongly the abundant production factors; that is, those that benefit most from trade in normal times. In addition and according to the specific factor model (Viner, 1931), a negative trade shock is likely to have a strong negative effect on production factors that cannot easily be re-employed in other sectors. Sector-specific capital is therefore likely to be negatively affected. Also, workers with skills that are specific to affected export sectors are more likely than other workers to experience unemployment, underemployment or wage reductions as a consequence of the trade shock.

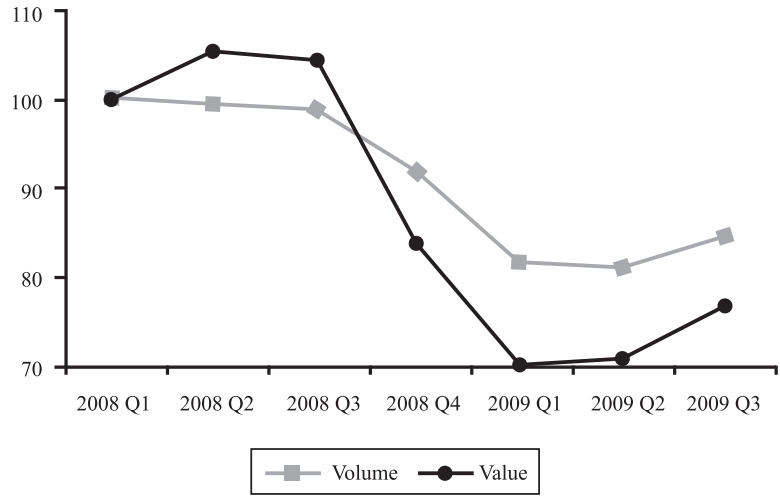
2.2 Global trade and price trends during the crisis[6]

The global economic and financial crisis has triggered a contraction in international trade that has been unprecedented in the past 60 years. In real terms, global trade flows started to decline as early as the first quarter

of 2008.[7] Price developments in international trade boosted the value of trade until the second quarter of 2008, but eventually it experienced a sharp drop of over 20 per cent in the fourth quarter of 2008 when many commodity prices started to decline (Figure 2.1). The decline in global trade came to a halt in the second quarter of 2009 in both volume and value terms and began to reverse in the third quarter, with GDP growth recovering around the world. However, trade still remains well below the levels reached in previous years.

Figure 2.1

Real and nominal world merchandise exports by quarter, 2008-09 Q3 (Q1 2008=100)



Source: Finger (2010), based on data from CPB, Trade Monitor.

While the overall trend for exports was downward, price and quantitative developments have differed significantly across product groups during the crisis. As a result, countries have been affected differently by the crisis-related trade shock, depending on the structure of their exports. Also, for some of the countries discussed in this study, the fluctuations in global food and commodity prices preceding the global financial crisis have had a significant impact.

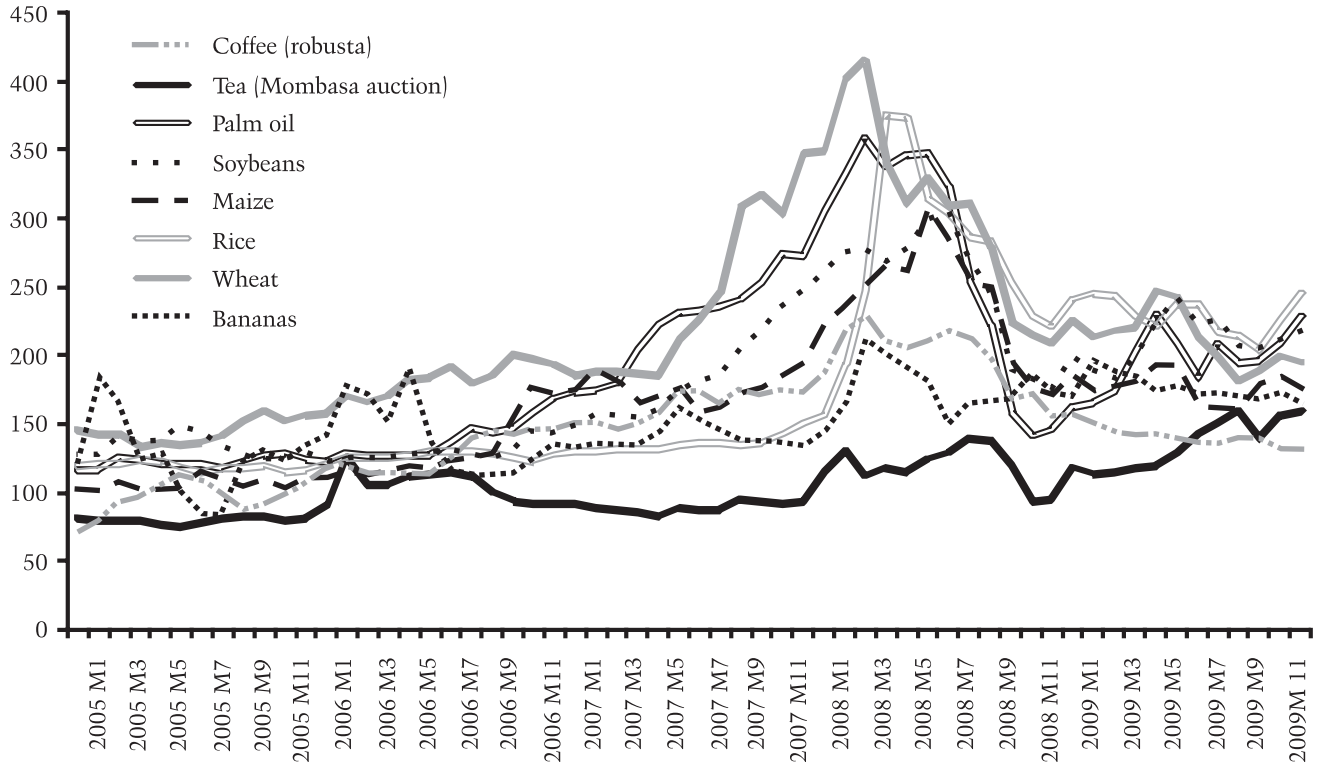
The food and commodity crisis that preceded the financial crisis

The global economic crisis unfolded at a time when the world was in the middle of what has rightfully been labelled a global food price crisis. Starting in 2007, world market prices for a number of important basic food items skyrocketed to unprecedented levels, lowering real incomes of workers around the world, and affecting the poor disproportionately as they tend to spend a higher share of their income on food. According to the UN Food and Agriculture Organization (FAO, 2009), this led to an increase in the number of undernourished people from 873 million in 2004-2006 to 915 million in 2008. This was the first increase in the share of undernourished people in the total world population since the beginning of the underlying time series data in 1969. While some producers benefit from high food prices, the majority of the population in developing countries are net-food buyers—even in rural areas. High food prices led to riots in a number of countries, leaving several people dead or severely injured, and induced governments to adopt emergency measures, including price controls and bans on food exports. A number of potential reasons for price inflation have been discussed in the literature, including increased world demand for livestock products, which competes for farmland with food crop agriculture, high oil and fertilizer prices, government subsidies for the growing of biofuels on farmland, droughts in important producer countries (sometimes attributed to climate change) and increased speculation in commodity markets through futures trading (Abott *et al.*, 2008; FAO, 2008; Mitchell, 2008). Using time-series analysis and price data for a number of key food commodities, Cooke and Robles (2009) find that speculation and financial activity in futures markets provides the most robust explanation.

Figure 2.2 shows monthly data on world market prices for important food commodities from the World Bank's Global Economic Monitor. The spike in 2007/08 in the prices for rice, maize, wheat, palm oil and soybeans is obvious. Bananas were affected less. The prices for tea and coffee increased only slightly, then suffered a moderate deterioration at the onset of the global economic crisis, but began to recover quickly. Following the beginning of the global economic crisis in September 2009, prices for rice, maize, wheat, palm oil and soybeans declined substantially. However, towards the end of the year, they remained well above their pre-2007 levels.

Figure 2.2

World market price indices for selected food items, 2005-09 (2000 M1 = 100)



Source: World Bank, Global Economic Monitor.

Box 2.1

Long-term trends in world market volatility

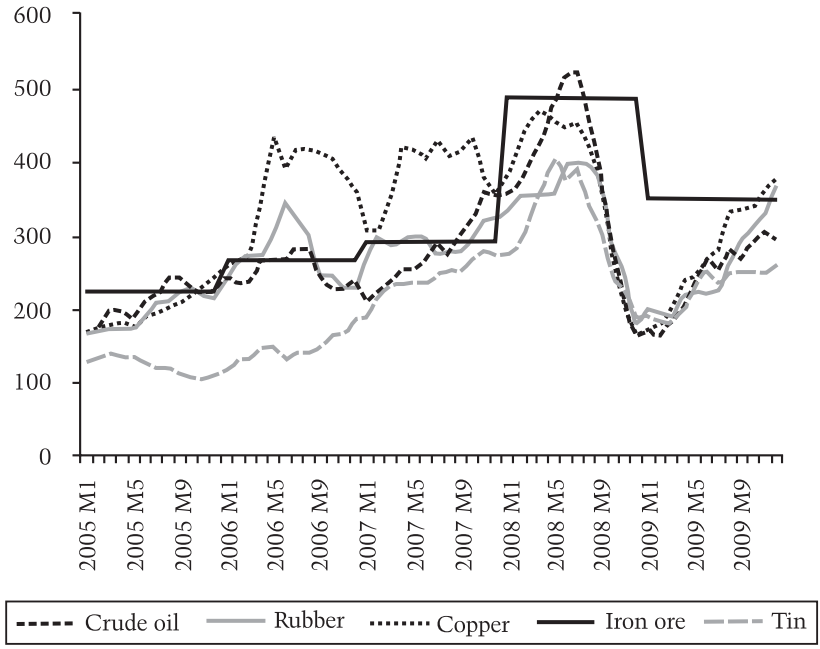
The question of whether there is a trend in the volatility of commodity prices remains debated in the literature. For example, analyzing a long-term time-series of commodity prices dating back to 1700, Jacks *et al.* (2009) find little evidence for an increase in volatility of commodity prices, but they do confirm that world market prices for commodities have been more volatile than prices for manufactured goods. Focusing on a shorter period, UNCTAD (2008, 2009) finds that non-oil commodity price volatility was higher in the past decade than in the 1980s and 1990s, but lower than in the 1970s. The International Monetary Fund (IMF, 2006) finds that non-fuel commodity price volatility has decreased over recent years; however, it also warns that food price volatility may well increase in the future (IMF, 2009a). The World Bank (2010) predicts that in the medium term, commodity prices will be fairly stable, but in the long run they may become more volatile as speculation in commodity markets increases.

It is commonly believed that the outbreak of the global economic crisis contributed to the decline in food prices by reducing global demand, bringing down oil prices and depressing futures speculation for commodities. A number of good harvests in important producer countries also played a role in bringing down food prices. Overall, there is some ambiguity regarding the effect of the economic crisis on consumers in poor countries. While some consumers may have benefited from the reduction in food prices, the net effect of the global economic crisis tends to have been negative due to the severe income losses it brought about. The FAO (2009) estimates that the number of undernourished people will increase from 915 million to 1,020 million, with most of the increase caused by the global economic crisis.

A number of other important commodities also experienced significant world market price fluctuations before and during the crisis, a phenomenon that is often attributed to China's increasing demand for raw materials. World market prices for crude oil, metals such as copper, iron and tin, and other raw materials, such as rubber, increased steadily from 2005 (Figure 2.3) and reached a highpoint in mid 2008, before dropping significantly when the crisis unfolded. Since early 2009, they have already begun to recover, and although they are still below their peak in 2008, they once again stand way above their historical levels. In combination with the food price shock described above, this led to strong volatility in the terms of trade of many developing countries, which are often significant exporters and importers of raw materials.

Figure 2.3

World market price indices for selected commodities, 2005-09 (2000 M1 = 100)



Source: World Bank, Global Economic Monitor.

The impact of the global food and commodity inflation in 2007/08 on employment and household incomes and its interaction with the global economic crisis are determined by a number of household- and country-specific factors. For example, the impact of price fluctuations on terms of trade will be very different depending on the composition of the country's import and export portfolio. The impact on employment and household income will to a large extent depend on local production patterns and consumer preferences. Food markets are often highly segregated and most food is traded locally and never reaches the world market, so global price fluctuations are not necessarily transmitted fully to the local level. Even within the same community, the impact of price fluctuations will depend on whether a household is a net consumer or a net producer of food items.

It also depends on the extent to which income is received in cash or in terms of food—the latter being a common practice for agricultural wage workers in developing countries. The country-level evidence on Liberia and Uganda, discussed in Chapter 3, provides more detailed insights into the country-specific patterns through which food and commodity inflation interacted with the impact of the global economic crisis.

Box 2.2

Exchange rate volatility during the crisis

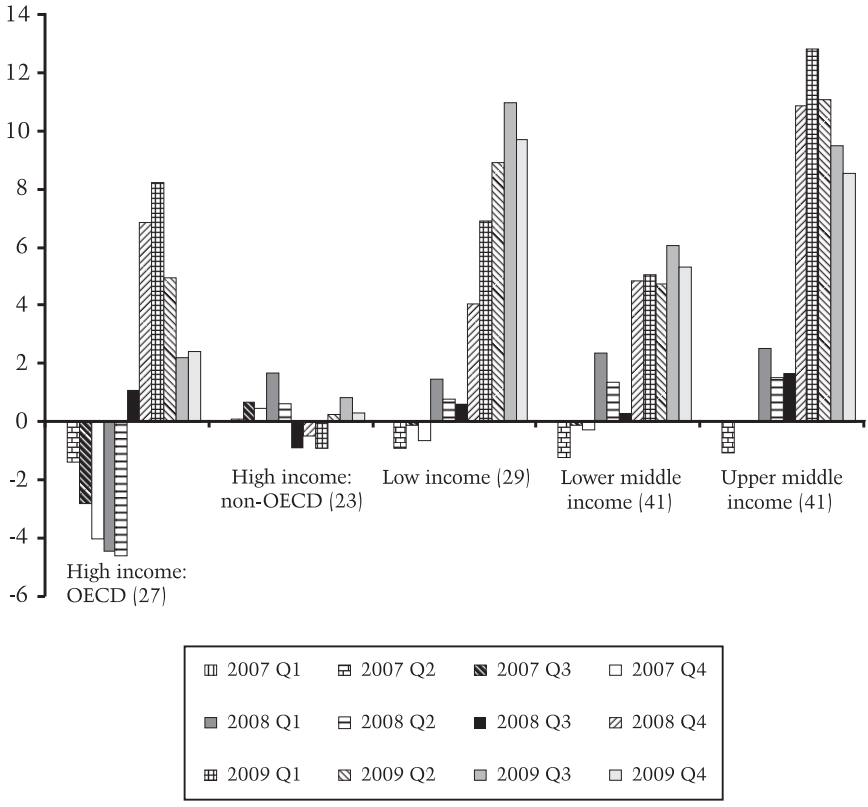
The global economic crisis led to substantial volatility in international exchange rates, which can have strong repercussions for trade. The depreciation of a currency increases the profitability of exporting in the domestic currency and makes imports more expensive. Thus, it increases the competitiveness of a country's exporters, but harms importers—and also harms consumers by contributing to inflation. Conversely, currency appreciation makes imports cheaper, but undermines the competitiveness of exporters in international markets. Volatility in the exchange rate can be problematic for both importers and exporters as it increases their uncertainty about future prices. This is particularly problematic for companies in countries with underdeveloped financial systems that do not have access to financial instruments to hedge the currency risk.

Figure 2.4 presents an overview of exchange rate movements during the crisis by income groups of countries. The sample was constructed based on IMF data on the exchange rate movements of 161 countries. Exchange rates are defined as local currency/special drawing right (SDR), so a positive bar means depreciation, and simple unweighted averages were used for each group. The value of SDRs is defined based on a basket of four reference currencies: the US dollar, the Euro, the Japanese yen and the British pound. This means that movements shown here represent currency value fluctuations relative to the weighted average of these four currencies.

With the exception of the high-income non-OECD countries, on average all groups depreciated against the SDR in the fourth quarter of 2008, when the crisis unfolded. The impact was the strongest for upper middle income countries, where on average currencies depreciated over 12 per cent against their value at the beginning of 2007 and then eventually regained some value. Low-income countries were also affected strongly by an initially smaller, but continuing, depreciation, which reached its peak in the third quarter of 2009 at 11 per cent below the level in early 2007. In high-income OECD countries, a trend towards appreciation was reversed at the beginning of the crisis, and the third and fourth quarters of 2008 saw substantial depreciation (from -4 per cent to +8 per cent) that was partially reversed in the second half of 2009. These average results were driven mainly by the strong depreciation of the Icelandic crown and, to a less a extent, the British pound and Korean won. Lower middle income countries were affected less severely, but remained on average at roughly 5 per cent below their 2007 values since the beginning of the crisis. Only the group of high-income non-OECD countries remained largely unaffected.

Figure 2.4

Average exchange rate fluctuation by income group, 2007-09 (percentages)



Note: Bars show the mean exchange rate index (2007 Q1 = 0) for each group where the exchange rate is defined, as local currency/SDR.

Source: Authors' calculations based on data from IMF.

Regional and sectoral trade patterns during the crisis

The trade shock experienced during the crisis was both acute and global, in that it affected all regions in the world, as illustrated in Table 2.2. World merchandise trade still experienced growth of around 15 per cent in 2008

and then dropped by 30 per cent in the first three quarters of 2009. All world regions experienced export drops of above 20 per cent, but the drop was particularly sharp in Commonwealth of Independent States (CIS) countries and in Africa and the Middle East, regions that are important exporters of fuel and metals and which had benefited from the price hikes in 2007 and 2008.

Table 2.2

World merchandise exports and imports by region, 2008-09

(Percentage change over preceding year, based on dollar values)

	Exports		*Imports*	
	2008	*2009 (Jan–Sept)*	*2008*	*2009 (Jan–Sept)*
World	15	-30	15	-30
Western Europe	11	-30	12	-32
Asia	14	-24	20	-27
North America	11	-27	8	-30
South/Central America	21	-25	30	-32
CIS	35	-45	32	-41
Africa and Middle East	31	-50	26	-21

Source: Finger (2010), based on data from WTO, CPB and author's calculations.

Within manufacturing (Table 2.3), trade in automotive products experienced the steepest decline towards the end of 2008 and in the first half of 2009, seriously affecting major car-exporting countries such as Germany and Japan. Iron and steel recorded an above average decrease after the first quarter of 2009, and became the manufacturing sector with the strongest contraction in the second and third quarter of 2009. This contraction has significantly affected Ukraine, one of the countries discussed in Chapter 3. Sectors that are highly relevant for developing countries, such as office and telecom equipment and textiles and clothing, have also been affected by the crisis, but less so than durable goods sectors, such as automobiles. The reported decreases in world exports of textiles and clothing, for instance, have remained below 20 per cent during 2008 and 2009 as reported in Table 2.3.

Table 2.3

World manufacturing exports by quarter, 2008-09 Q3

(percentage changes, year-on-year, current dollar values)

	2008 Q1	*2008 Q2*	*2008 Q3*	*2008 Q4*	*2009 Q1*	*2009 Q2*	*2009 Q3*
Manufacturing	**15.4**	**17.9**	**12.5**	**-11**	**-28**	**-29.9**	**-20.8**
Iron and steel	13.8	25.9	41.4	3.7	-38	-55.5	-54.8
Automotive products	14.8	15	2.6	-26.5	-47.1	-45.8	-16.8
Office and telecom equipment	9.3	12.4	6.6	-14.7	-28.4	-22	-29.6
Chemicals	18.4	23.5	20.4	-6.7	-23.5	-24.6	-12.4
Textiles and clothing	9.6	9.5	6	-7.2	-16	-19.8	-14.5

Source: Finger (2010), based on data from WTO.

Trade in services also declined in 2009, but significantly less than merchandise trade and with substantial variation between different types of trade. Trade in financial, transport and tourism services dropped significantly during the crisis, but trade in a range of business, technical and professional services continued to grow (Borchert and Mattoo, 2009). Trade in transport services followed the cyclical downturn of merchandise trade. In air transport, the downturn was—not surprisingly—driven by air freight. International passenger traffic only declined by 4.7 per cent in the first nine months of 2009 and increased slightly in October 2009. This relatively early recovery of passenger air traffic mirrors the development of international tourist arrivals. The United Nations World Tourism Organization (UNWTO) reports a 7 per cent decline in arrivals for the first eight months of 2009 and estimates that the decline for the whole of 2009 will be around 5 per cent. A noteworthy feature in world tourism in 2009 is the outstanding development of tourism in Africa. In the first eight months of 2009, the number of international tourist arrivals continued to increase in Africa, by nearly 4 per cent, while all other regions reported declines of between 5 per cent and 8 per cent (UNWTO, 2009).

2.3 Global employment and wage trends during the crisis

This section discusses global and regional trends in employment, unemployment, labour force participation and wages during the global economic crisis. The year 2007 is used as a benchmark for comparison as

the crisis began to take effect in the second half of 2008. While employment was quick to fall following the effect of the shock on output, it may take much longer to recover.

Regional patterns

World GDP contracted by 1.1 per cent in 2009 (Table 2.4). The slowdown was truly global, in the sense that growth declined in every region of the world in comparison to 2007. However, only the developed economies and European Union (EU), Central and Southern Europe and CIS, and Latin America and Caribbean actually experienced negative growth over 2009, whereas the rest of the world experienced positive growth but at a lower rate. The highest growth rates were in East Asia (+6.1 per cent) and South Asia (+5.0 per cent). While global employment growth was still positive in 2009 (+0.7 per cent), it also slowed down substantially in all regions of the world except for the Middle East, and turned negative in the worst affected regions: developed economies and EU and Central and Southern Europe and CIS.

Table 2.4

GDP and employment growth by region, 2009 versus 2007

(percentages)

	Real GDP growth			*Employment growth*		
	2007	*2009*	*diff*	*2007*	*2009*	*diff*
World	5.2	-1.1	-6.2	1.9	0.7	-1.2
Developed economies and European Union	2.6	-3.5	-6.2	1.4	-2.5	-3.9
Central and South Eastern Europe (Non-EU) & CIS	7.6	-6.5	-14.1	2.1	-2.2	-4.3
East Asia	11.2	6.1	-5.1	0.9	0.9	0.0
South-East Asia and the Pacific	6.5	0.5	-6.1	2.5	1.7	-0.8
South Asia	8.7	5.0	-3.7	2.4	1.8	-0.6
Latin America and the Caribbean	5.7	-2.5	-8.2	2.1	0.2	-1.9
Middle East	6.1	1.4	-4.7	3.0	3.7	0.7
North Africa	5.8	3.7	-2.1	2.7	2.4	-0.3
Sub-Saharan Africa	6.8	1.2	-5.7	3.0	2.8	-0.2

Source: ILO (2010). *Global Employment Trends*, January.

Table 2.5

Unemployment by region, 2009 versus 2007

(percentages)

	Total			*Male*			*Female*			*Youths*			*Adults*		
	2007	*2009*	*diff*	*2007*	*2009*	*diff*	*2007*	*2009*	*diff*	*2007*	*2009*	*diff*	*2007*	*2009*	*diff*
World	5.7	6.6	0.9	5.5	6.3	0.8	6.0	7.0	1.0	11.8	13.4	1.5	4.2	5.0	0.8
Developed economies and European Union	5.7	8.4	2.6	5.5	8.2	2.7	6.0	8.6	2.6	12.2	17.7	5.5	4.8	7.0	2.3
Central and South Eastern Europe (Non-EU) & CIS	8.3	10.3	2.0	8.4	10.6	2.2	8.1	9.8	1.7	17.5	21.5	4.0	6.6	8.3	1.7
East Asia	3.8	4.4	0.6	4.3	5.0	0.7	3.2	3.7	0.5	7.8	9.0	1.2	3.0	3.5	0.5
South-East Asia and the Pacific	5.4	5.6	0.2	5.2	5.5	0.3	5.8	5.9	0.1	14.9	15.3	0.4	3.1	3.4	0.3
South Asia	5.0	5.1	0.1	4.7	4.8	0.1	5.8	5.9	0.2	9.9	10.7	0.8	3.5	3.5	0.0
Latin America and the Caribbean	7.0	8.2	1.2	5.8	6.9	1.1	8.8	10.1	1.4	14.1	16.6	2.4	5.1	6.1	1.0
Middle East	9.3	9.4	0.2	7.7	7.7	0.0	14.4	15.0	0.7	21.4	22.3	1.0	5.6	5.8	0.2
North Africa	10.1	10.5	0.4	8.4	8.6	0.2	14.6	15.6	1.0	23.6	24.7	1.0	6.1	6.5	0.3
Sub-Saharan Africa	8.0	8.2	0.2	7.6	7.8	0.2	8.5	8.8	0.3	12.3	12.6	0.3	6.3	6.5	0.3

Source: ILO (2010). *Global Employment Trends*, January.

The latest preliminary estimates for 2009 from the ILO's *Global Employment Trends* (January 2010) had global unemployment increasing by 0.9 percentage points to 6.6 per cent (Table 2.5). While the increase was strongest in the Developed economies and EU (+2.6 per cent) and Central and Southern Europe and CIS (+2.0 per cent), all regions of the world experienced increases in the unemployment rate due to the slowdown in employment growth and growing labour forces.

At the global level, female unemployment rose (+1 per cent) slightly more than male unemployment (+0.8 per cent), but there were substantial differences at the regional level. The crisis affected women more severely than men in regions where the gender disparities in unemployment rates were already high, such as North Africa (female: +1 per cent; male: +0.2 per cent), the Middle East (female: +0.7 per cent; male: no change) and Latin America and Caribbean (female: +1.4 per cent; male: +1.1 per cent). Conversely, men were affected by the crisis more severely than women in those regions where male unemployment was higher than female unemployment in 2007: Central and Southern Europe and CIS (female: +1.7 per cent; male: +2.2 per cent)and East Asia (female: +0.5 per cent; male: +0.7 per cent). Thus, while there is no strong gender bias in the unemployment effect of the crisis at the global level, where strong gender disparities already existed, these seem to have been aggravated by the crisis.

Youths were already facing a substantially higher unemployment rate in 2007. This was aggravated by the crisis, which had a disproportional impact on employment of youths. At the global level, youth unemployment increased by 1.5 percentage points, whereas unemployment for adults increased by 0.8 percentage points. The disproportionate impact on youths is apparent throughout all regions of the world and is a phenomenon often observed during crisis episodes (Islam *et al.*, 2000).

Employment losses can also affect people's decisions regarding whether or not to seek employment, and thus can alter the rate of labour force participation (Islam *et al.*, 2000). The effect of a downturn can go either way. On the one hand, a decline in the number of available jobs can discourage job seekers and lead them to withdraw from the labour force (note that the labour force by definition contains both workers and job seekers). Verick (2010) argues that this was the main effect of the crisis on

the South African labour market. On the other hand, some households, especially in very poor countries, react to income losses by increasing the number of household members that seek employment.

The evidence on labour force participation during the global economic crisis is ambiguous: while there does not appear to be a significant change at the aggregate global level, there are differences between regions (Table 2.6). Labour force participation declined by 0.3 percentage points in East Asia and by 0.2 percentage points in the developed economies and European Union. It increased the most in North Africa (+0.5 per cent) and the Middle East (+0.4 per cent). While the evidence is too scattered to allow a firm conclusion, it does appear that among the opposing effects discussed above, discouragement was stronger in richer countries. In all regions other than North Africa, discouragement is more pronounced for men than for women, or the effect of additional household members being added to the workforce is stronger for women than for men. The latter could imply a pattern where women step in as income earners to substitute for lost income if their husband loses his job. The labour force participation ratio is significantly higher for adults than for youths across all regions, but there are marked differences in the change between 2007 and 2009. For example, in Latin America and Caribbean, the labour force participation rate for adults increased (+0.4 per cent) while that for youths declined (-0.7 per cent). In East Asia (youths: +0.3 per cent; adults: -0.6 per cent) and North Africa (youths: +0.9 per cent; adults: no change), the pattern was the other way round.

Comprehensive global data to track the impact of the crisis on wages was not yet available at the time this study was written. However, the ILO (2009c) provides some figures for a sample of 53 countries for which data was already available in the Global Wage Database in early 2010. The median growth rate for real wages in this sample fell from 4.3 per cent in 2007 to 1.4 per cent in 2008, with over a quarter of the countries in the sample experiencing stagnant or falling real wages. In the first quarter of 2009, more than half of the countries in the sample experienced a decline in real wages compared with 2008. Country-level evidence presented in the report also suggests a decline in the weekly number of hours worked in most countries and an increase in wage arrears.

Table 2.6

Labour force participation by region, 2009 versus 2007

(percentages)

	Total			*Male*			*Female*			*Youths*			*Adults*		
	2007	*2009*	*diff*	*2007*	*2009*	*diff*	*2007*	*2009*	*diff*	*2007*	*2009*	*diff*	*2007*	*2009*	*diff*
World	64.7	64.7	0.0	77.8	77.7	-0.1	51.6	51.6	0.0	51.1	51.0	-0.1	69.2	69.1	-0.2
Developed economies and European Union	60.7	60.5	-0.2	69.1	68.6	-0.5	52.8	52.9	0.0	50.7	50.3	-0.4	62.6	62.4	-0.2
Central and South Eastern Europe (Non-EU) & CIS	59.3	59.2	0.0	69.2	69.0	-0.2	50.5	50.6	0.1	41.5	41.6	0.1	64.3	63.9	-0.3
East Asia	73.4	73.1	-0.3	79.6	79.4	-0.3	66.8	66.5	-0.3	58.9	59.2	0.3	77.4	76.8	-0.6
South-East Asia and the Pacific	69.4	69.5	0.1	81.9	82.0	0.1	57.2	57.4	0.2	52.0	51.6	-0.3	75.6	75.7	0.1
South Asia	58.9	58.8	-0.1	81.7	81.6	-0.1	34.8	34.9	0.1	46.8	46.6	-0.2	63.9	63.8	-0.1
Latin America and the Caribbean	65.2	65.4	0.2	80.1	79.7	-0.3	51.0	51.7	0.7	53.0	52.3	-0.7	69.4	69.8	0.4
Middle East	51.2	51.5	0.4	75.1	75.3	0.2	24.8	25.4	0.6	36.5	36.4	0.0	58.2	58.3	0.0
North Africa	51.3	51.8	0.5	75.5	76.4	1.0	27.3	27.4	0.1	37.2	38.0	0.9	57.7	57.7	0.0
Sub-Saharan Africa	71.4	71.7	0.2	81.1	81.2	0.2	61.9	62.6	0.3	57.5	57.5	0.3	79.1	79.5	0.3

Source: ILO (2010). *Global Employment Trends*, January.

The ILO (2008) highlights the fact that the real wages of poor workers in developing countries, who spend a high share of their income on food, had already come under pressure in 2008 due to global food price inflation. While world market prices for most food products declined somewhat in 2009, the recent declines in workers' real wages have to be understood as a complex combined effect of the two crises, the interaction of which varies strongly across countries. This is discussed in greater detail in Chapter 3 (Section 3.3). The ILO (2008) also shows that during the past decade, the elasticity of real wages to per capita GDP growth—that is, the percentage change in real wages resulting from a 1 per cent change in per capita GDP—was 0.65 in times of positive GDP growth, but 1.55 in times of negative GDP growth. In other words, wage earnings increased more slowly than per capita GDP in times of growth, but decreased more rapidly in times of recession. This implies that a negative GDP shock may result in permanent losses for wage earners that are not compensated after economic growth has resumed.

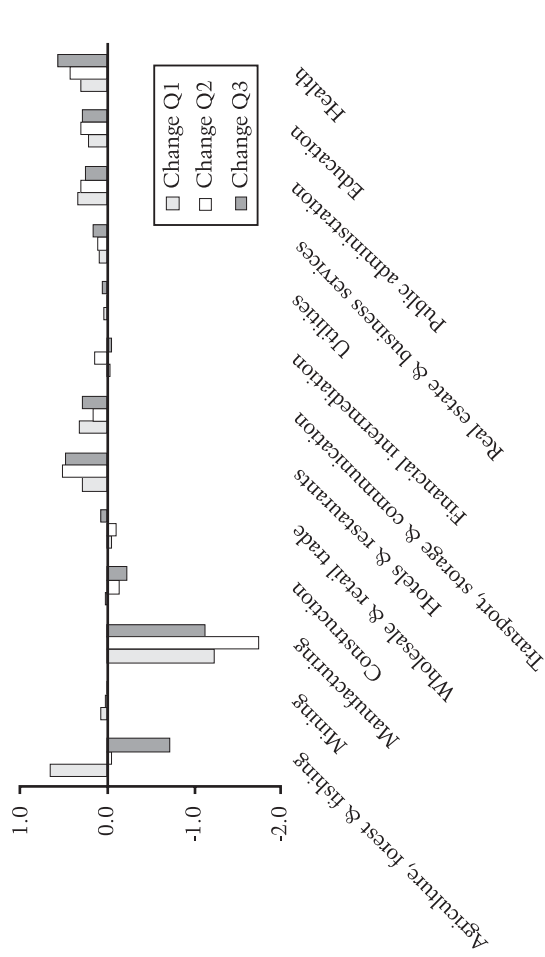
Sectoral patterns

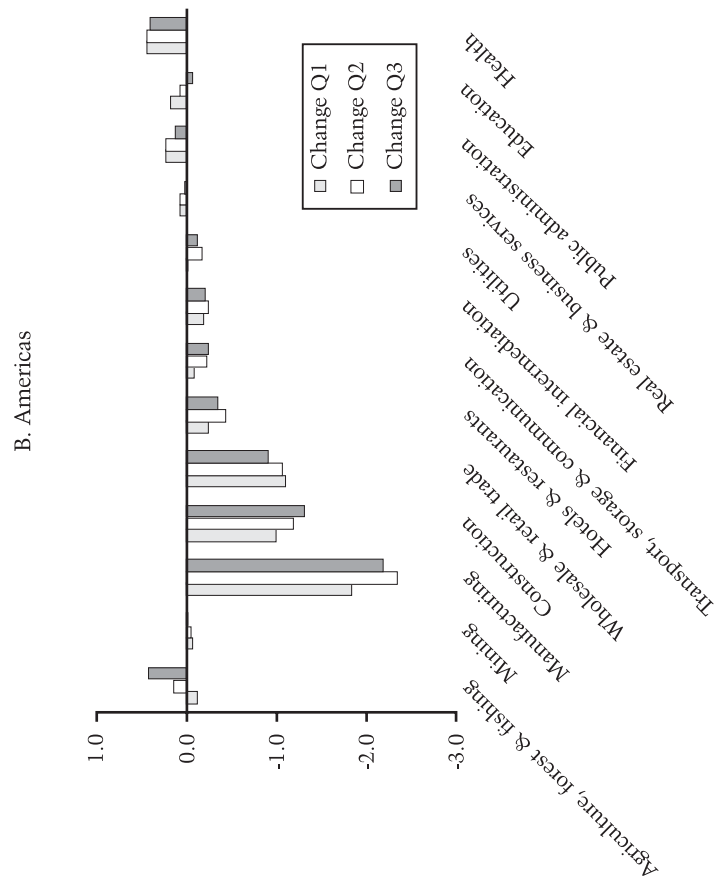
Employment changes during the crisis differed significantly across sectors, as reflected in Figure 2.5. For the sample of 56 countries covered by the data below, job losses in manufacturing alone reached 9 million in the third quarter of 2009 when compared with the same quarter in the previous year. Job losses were also severe in construction and mining, while sectors characterized by a significant level of public employment—such as education and health—experienced employment growth. The sectoral pattern of employment changes also differs across regions. Overall, employment in Asia and the Pacific has shown greater resilience in most economic activities than in Europe and the Americas. Employment effects in construction and mining, for instance, have been minor in Asia and the Pacific. Only in manufacturing has the extent of employment declines been similar to that in Europe and the Americas, probably reflecting that this sector is the one most integrated in global production networks.

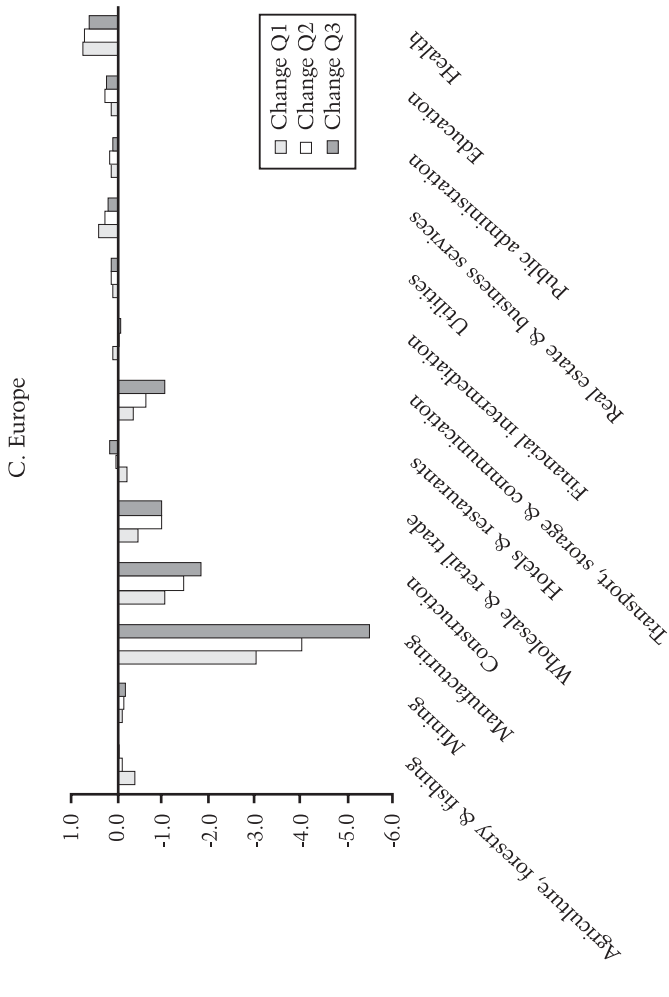
Changes in employment levels have been more significant than wage changes. Figure 2.6 shows percentage changes in wages for a sample of nine countries.[8] Wage reductions were most significant in the hotel and restaurant sector, a sector that has not experienced employment reductions

Figure 2.5

Employment changes by economic activity, 2008-09 (selected economies, millions)




B. Americas
Change Q1
Change Q2
Change Q3
1.0
0.0
-1.0
-2.0
-3.0
Agriculture, forest & fishing
Mining
Manufacturing
Construction
Wholesale & retail trade
Hotels & restaurants
Transport, storage & communication
Financial intermediation
Utilities
Real estate & business services
Public administration
Education
Health

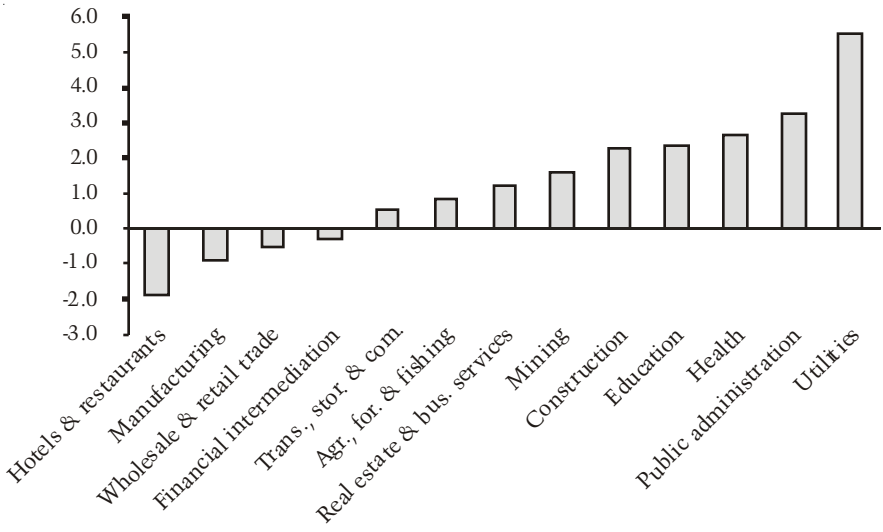


Source: ILO (2010a). Sectoral Activities Department, based on national Labour Force Surveys, Eurostat and official estimates of 56 countries.

in Europe or Asia and the Pacific.[9] Manufacturing and wholesale and retail trade experienced both wage and employment reductions, according to the evidence reported in Figures 2.5 and 2.6.

Figure 2.6

Average change in wages by economic activity, Q1:Q3 2008-09 (selected economies, percentages)

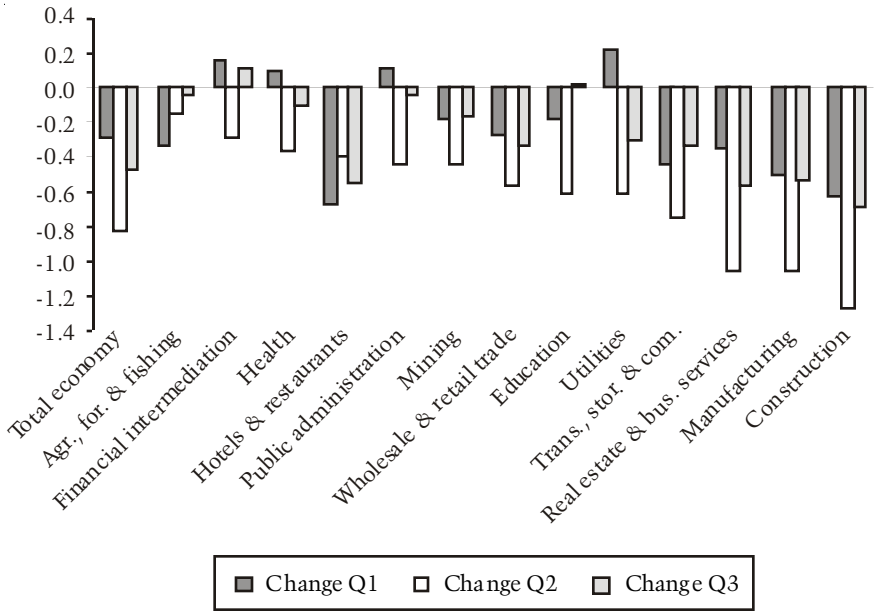


Source: ILO (2010a). Sectoral Activities Department, based on national Labour Force Surveys and official estimates of 9 countries.

The phenomenon of a reduction in the average weekly hours worked, by contrast, appears to be of a general nature as it has affected all sectors at some stage during the crisis (Figure 2.7). The reduction is strongest in manufacturing and construction, the two sectors that are also characterized by the largest employment reductions. The real estate and business services sector has also experienced a reduction in average weekly hours of work, while employment levels and wages on average showed a slight increase.

Figure 2.7

Average change in weekly hours of work, 2008-09
(selected economies, percentages)



Source: ILO, based on National Labour Force Surveys, Eurostat and official estimates of 37 countries.

Notes

1 Recent evidence on fluctuations in Mexico's maquiladora industry even suggests that global production networks are a means to export volatility, in the sense that suppliers—typically located in low- or middle-income countries—experience higher fluctuations in economic activity than the corresponding industry in the country where the final product is consumed, and often where it is produced (Bergin *et al.*, 2009).

2 Annex 1 presents summary statistics for the sample of 84 low- and middle-income countries used in the exercise.

3 The contrary holds true for services trade: a higher level of services exports/GDP was associated with a smaller decline in GDP. One reason for this rather surprising observation could be the finding by Borchert and Mattoo (2009) that services trade has been much more resilient during the crisis than merchandise trade.

4 See Bacchetta *et al*. (2009a) for an exhaustive overview of the literature on globalization and informal jobs.

5 As illustrated in the case study of Egypt discussed in Chapter 3 (Section 3.6) of this study.

6 This section is partially based upon Finger (2010).

7 Seasonally adjusted volume data for international trade on a monthly basis is provided by the CPB Netherlands Bureau for Economic Policy Analysis, available at *http://www.cpb.nl/eng/research/sector2/data/trademonitor.html*

8 The countries included in the sample are: Australia, Canada, Japan, Russia, Singapore, South Africa, Thailand, the United Kingdom and the United States.

9 This is in line with the findings reported in the Egypt case study Chapter 3 (Section 3.6).

3 The impact of the crisis at the country level and trade as a transmission channel

3.1 Introduction to the ILO's country-level work on the crisis: What, where and how?

In order to provide a nuanced picture of the effect of trade on employment during the global crisis, the ILO has conducted or commissioned several country-level studies using a variety of methodologies and approaches. This section is built upon the findings of six different studies for seven countries: Brazil, Egypt, India, Liberia, South Africa, Uganda and Ukraine. Six of the seven countries have in common that they had an above world average growth performance as well as double digit average export growth in the 2000-2007 period (Table 3.1). The exception is Liberia, which went through a period of conflict during this time. The countries differ significantly in their levels of trade intensity (trade per capita), ranging from US $4,000 for South Africa and $3,000 for Ukraine to below $500 for India and around $230 for Liberia. In terms of trade to GDP, Liberia (114 per cent) and Ukraine (98 per cent) are the most open countries, while openness is lowest in India (48 per cent) and Brazil (26 per cent).[1] Annex 2 provides information on the major export products for the different countries.

It should be noted that most of the 2009 data, and in some cases even the 2008 data, in Table 3.1 is preliminary or based on forecasts by the respective sources. All countries were to some extent affected by the crisis, but there is substantial variation in terms of the magnitude of the shock. According to the latest IMF estimates for growth in 2009,[2] Ukraine (-14.0 per cent), South Africa (-2.2 per cent) and Brazil (-0.7 per cent) went into recession over the year as a whole. The other countries still grew, and some of them quite substantially (Uganda: +7.0 per cent; India: +5.4 per cent),

Table 3.1

Major economic indicators for countries covered by ILO crisis studies

	Population (million) 2007	*GDP per capita (US$ PPP) 2007*	*Income group 2007*	*Real GDP growth*			*Trade / GDP*	*Trade (US$) per capita*	*Total exports of goods on a free-on-board basis (% change per annum)*		
				av. 2000–07	*2008*	*2009*	*2006–08*	*2006–08*	*av. 2000–07*	*2008*	*2009*
Brazil	190	9 684	Upper middle	3.5	5.1	-0.7	26.2	1 854	16.6	23.2	-22.7
Egypt	80	5 042	Lower middle	4.7	7.2	4.7	72.9	1 217	21.6	22.1	-19.3
India	1 125	2 753	Lower middle	7.2	7.3	5.4	47.6	467	20.8	34.5	-17.9
Liberia	4	371	Low	0.0	7.1	4.9	114.5	227	6.3	32.7	-38.5
South Africa	48	9 768	Upper middle	4.2	3.1	-2.2	67.5	3 837	13.2	15.7	-22.1
Uganda	31	1 075	Low	7.3	9.0	7.0	53.6	212	21.3	35.2	17.8
Ukraine	47	6 933	Lower middle	7.5	2.1	-14.0	98.0	3 026	20.4	35.8	-40.7
World	6 614	9 996		4.2	3.0	-1.1	56.8	4 267	12.1	14.9	-23.0

Source: World Bank, IMF, WTO and National Central Banks.

but in all countries growth in 2009 was lower than in 2008, and only in Liberia was growth in 2009 higher than the average rate in 2000-2007. With the exception of Uganda,[3] all countries experienced a sizeable export contraction in 2009, suggesting that those countries that managed to still realize positive GDP growth in 2009 did so based on strong performance of the domestic economy. The export contraction was strongest in Ukraine (-41 per cent) and Liberia (-38 per cent). The impact was even more drastic when comparing the export growth rates of 2009 with 2008, where most countries achieved exceptionally high export growth. In most cases, those were fuelled by the boom in international commodity prices in 2007/08 (note that the figures reported are value changes). All countries in the sample achieved double digit export growth rates in 2008, with Ukraine (+36 per cent), Uganda (+35 per cent) and India (+35 per cent) leading the way.

Table 3.2 provides selected labour market statistics for the seven countries, drawn from the ILO's *Key Indicators of the Labour Market* (KILM) for the latest available years. This information pre-dates the crisis, and its purpose is to give some context and highlight the differences in employment conditions in the countries covered by the studies. Data for 2009 was not yet available in the KILM database when this study was written. To the extent that post-crisis labour market data was available from national sources, it is presented in the respective sections.

South Africa had the highest pre-crisis unemployment rate of the seven countries at 23 per cent, with a bias against women (female: 26 per cent; male: 20 per cent). It also has the largest share of wage employment (82 per cent) in the sample. In Brazil (64 per cent), Egypt (62 per cent) and Ukraine (81 per cent), the majority of jobs were also in wage employment. Among these countries, unemployment was highest in Egypt (9 per cent), followed by Brazil (8 per cent) and Ukraine (6 per cent). In Brazil, and especially in Egypt, unemployment was much higher among women, while in Ukraine it was slightly higher among men. India (5 per cent), Liberia (6 per cent) and Uganda (3 per cent) had the lowest rates of unemployment of the seven countries. The data on status in employment for Uganda shows that a high proportion of the workforce is classified as own account workers (60 per cent) or contributing family members (26 per cent). The low unemployment rate thus mainly reflects the fact that in the absence of

Table 3.2

Selected labour market statistics (pre-crisis) for countries covered by ILO crisis studies

	Unemployment				*Labour force participation (15–64)*				*Status in employment (%)*					
	Total	*Male*	*Female*	*Data year*	*Total*	*Male*	*Female*	*Data year*	*Wage workers*	*Employers*	*Own account workers*	*Contributing family workers*	*Unknown / unclassified*	*Data year*
Brazil	7.9	6.1	10.0	2008	74.4	85.2	64.0	2008	63.6	4.5	21.2	6.0	4.7	2006
Egypt	8.7	5.9	19.3	2008	50.5	76.4	24.4	2008	61.8	13.4	11.7	13.1	0.0	2006
India	5.0	4.9	5.3	2004	61.0	84.5	35.7	2008	n.a.	n.a.	n.a.	n.a.	n.a.	
Liberia	5.6	6.8	4.2	2007	72.9	76.8	69.1	2008	n.a.	n.a.	n.a.	n.a.	n.a.	
South Africa	22.9	20.0	26.3	2008	58.9	67.0	51.0	2008	82.4	14.7	2.3	0.4	0.2	2007
Uganda	3.2	2.5	3.9	2003	85.8	91.2	80.5	2008	14.5	0.3	59.1	26.1	0.0	2003
Ukraine	6.4	6.7	6.0	2008	67.3	72.6	62.3	2008	80.7	n.a.	n.a.	0.4	n.a.	2007

Note: n.a. = data not available.

Source: ILO, *Key Indicators of the Labour Market*.

unemployment benefits, people cannot afford to be unemployed and thus have to revert to precarious forms of employment if they are unable to find a formal job. The information on status in employment is not available for India and Liberia in the KILM database, but it is likely that the relatively low unemployment rates reflect similar underlying patterns.

Labour force participation in the age group 15-64 was highest in Uganda (86 per cent) and lowest in Egypt (51 per cent). It was higher for males than for females in all countries, but the gender disparities were particularly strong in India and in Egypt.

Different methodologies were chosen to examine the effect of trade on employment in the seven countries discussed in this Chapter. The choice of methodology for each country was determined by data availability and by time constraints where country analyses were carried out upon the request of governments and with a view to contributing to urgent policy decisions during the crisis.

For the India and South Africa study, quantitative analyses were carried out on the basis of a social accounting matrix (SAM)-based Leontief multiplier model. This approach makes it possible to trace the impact of a trade shock from one sector of the economy to another. It also simulates the impact on households and the repercussions in terms of income-induced consumption effects. The Leontief multiplier model has been widely used in the literature on trade and employment, but has well-known limitations, in particular that it is linear and non-dynamic. As a result, positive dynamic effects through economic growth or negative dynamic effects through labour displacing technical change cannot be assessed using this model. However, given this study's focus on short-term effects, these limitations are less relevant for the exercise conducted in the context of the ILO crisis work.

The Brazil study uses a computable general equilibrium (CGE) model which is also based on a SAM. General equilibrium models are able to deal with dynamic aspects. In the context of trade, such models are typically used to determine how trade flows change in reaction to a change in trade policy. Therefore, for the purpose of the present exercise, the model had to be adjusted to take into account an exogeneous trade shock. Furthermore,

being more sophisticated than Leontief multiplier models, CGE models are also more complex, which makes them less user-friendly.

In both the India and South Africa study and the Brazil study, the crisis-related trade shocks are defined at the sectoral level (following the sectors in the SAMs) on the basis of the changes in exports in the period February-April 2008 and February-April 2009. These observed trade shocks were used to estimate the impacts on employment and income. The models are described in more detail in the respective sections (3.4 and 3.5) and technical documentation can be found in Annex 3 and Annex 6.

The remaining four country studies—on Liberia, Egypt, Uganda and Ukraine—are based on rapid assessments of the impact of the economic crisis on employment which were sponsored by the ILO under its Global Jobs Pact. These assessments were guided by a methodology developed by the ILO in its guide on country-level impact assessment (ILO, 2009a). This takes a four-step approach: (1) an assessment of the pre-crisis situation, including existing vulnerabilities; (2) an assessment of the impact of the crisis at the macro level, in key sectors, as well as on the labour market; (3) an assessment of the mitigation capabilities of both households and government; and (4) an assessment of mitigation measures undertaken so far. The assessments were undertaken by teams of ILO staff from various departments and external experts. They are based on descriptive analyses of available data as well as the results of interviews in the countries. Focus group discussions conducted with main stakeholders (workers and employers) provided useful micro-level information, in particular on household-level effects of the crisis and coping strategies. Special attention was paid to the sectors most affected by the economic crisis, and in some cases special reports on specific sectors were commissioned, such as for textiles and tourism in the case of Egypt and the metallurgy sector in Ukraine.

Each methodology used has strengths and limitations. The SAM-based modelling can illustrate the mechanisms through which a trade shock is transmitted and can generate estimates of general equilibrium impacts on employment and income levels. It can also give an *ex ante* idea of what the impact of the crisis may be on household aggregates and the entire economy before empirical data is available or effects have even

materialized. They give a *ceteris paribus* scenario of the impact of just the trade shock in the absence of any other disturbances, most notably the financial impact of the crisis. They generate measurable results for the impact of a shock on different aggregates and it is possible to generate relative outcomes; that is, it is possible to compare the income or employment effects across different regions, household types or production factors.

The modelling-based exercises, however, have the disadvantage that they have to make *ex ante* assumptions on the behaviour of different entities during the crisis. They can therefore not be used to find out whether certain entities change their behaviour. For example, a recent study by Kang *et al.* (2009) found that rural households in Cambodia reacted seemingly irrationally to the crisis by sending more family members to work in the cities when jobs there became scarce. The motivation for this behaviour was to compensate for the decline in household once a family member working in the city had lost their job. Such a change in behaviour will typically not be predicted with standard models. Standard models will also not capture whether shocks have affected workers' bargaining power, as appears to have been the case in Liberia.

The main drawback with SAM-based modelling approaches is that they are quite data intensive and require substantial technical knowledge and time to construct and calibrate. They can, therefore, only be used to inform policy design during a crisis if they have been developed beforehand and are ready to be used when the crisis hits. The combination of descriptive data analysis, interviews and structured focus group discussions applied for the rapid assessments represents a more flexible tool. Yet, this method also has weaknesses. The methodology was designed to be applied under tight-time constraints and thus depends strongly on the availability of data and qualitative information in the country. The studies have generally done a good job in showing a comprehensive picture of the impact of the crisis on a country. They have delivered a broad picture of the crisis that takes into account not just the various channels through which the crisis may affect a country, but also the reactions by government, the private sector and households. In many cases, this has led to the formulation of hands-on policy proposals to deal with the impact of the crisis. The methodology is well suited to delivering quick responses to

governments seeking analytical support from the ILO in the midst of the crisis, as the studies were put together over a very short period. However, as dictated by the methodology, the arguments presented in these studies often have to be based on anecdotal evidence, the reliability of which can be questioned. While they provide detailed micro-level information, it is not necessarily appropriate to extrapolate insights for macro-level policy decisions as the microsample is not necessarily representative of the entire economy. Crucially, the quality of the evidence provided will ultimately depend on the quality of the choices made by those who conduct the studies. While this is also the case for modelling exercises, the effects of judgement or interpretations on findings can be discerned more easily in the latter.

The following overview of six country-level studies represents an attempt to draw together the results of very different methodological approaches and to take advantage of the synergies that emerge from the complementarity of their respective strengths. The presentation is structured around a number of themes that have been identified as salient features of the employment impact of trade in specific countries during the recent crisis episode.

3.2 Ukraine: The role of export concentration

This section takes a closer look at the link between export concentration and the impact of the global economic crisis on employment. It begins with a general review of the recent literature on export concentration, growth and volatility and then provides some stylized facts from the available data on the role of export concentration in the transmission of the global economic crisis. Subsequently, it presents country-level findings on the role that export concentration played in the impact of the crisis on Ukraine. Among the seven countries examined in this study, Ukraine experienced the sharpest drop in exports. Metal and metal products, mainly iron and steel, represent over 40 per cent of Ukraine's exports, and almost all exports are in heavy industries.

Export concentration, growth and volatility

The question of whether and how export concentration affects growth and a country's vulnerability to shocks has received a lot of attention in the

recent literature on trade. The renewed interest in the role of diversification in development was probably triggered by the influential contribution by Imbs and Wacziarg (2003). They find that countries typically diversify their production structure during the early development process but then begin to specialize again once they reach a certain level (this was confirmed by Koren and Tenreyro, 2007). Cadot *et al.* (2007) and Klinger and Lederman (2006) find that the same holds true for the structure of exporting, but the turning point after which countries start to specialize again probably is at a higher level of development for exports than for domestic production.

This evidence has led to new research into the relationship between diversification and growth. In the 1990s a number of studies dealt with the question of whether concentration in certain products—typically natural resources—is bad for growth. Sachs and Warner (1997) found that a high ratio of resource exports in GDP was associated with slower economic growth in the period 1970-1990. Hausmann *et al.* (2007) argue that the structure of a country's exports influences its future growth and that exporters of products exported by rich countries have higher growth prospects. This somewhat contradicted the earlier finding of Martin and Mitra (1999), who found that total factor productivity growth was higher in agriculture than in manufacturing in the period 1967-1992. In one of the more recent papers,Feenstra and Kee (2008) estimate a monopolistic competition model with heterogeneous firms for 48 countries and find that higher variety in exports to the United States is associated with higher total factor productivity, but this holds true mainly for within-country variation among firms, while the across-country effect is small. Lederman and Maloney (2007) apply several econometric tests to confirm that overreliance on just a few products has a negative effect on total exports. Hesse (2009) also finds that export concentration has a negative impact on per capita income, but argues that the effect may be non-linear in the sense that low-income countries benefit from higher export diversification, while high-income countries may be better-off specializing in fewer products.

One channel through which concentration can negatively affect growth is income volatility. For example, Jansen (2004) and Malik and Temple (2006) find that export concentration leads to higher volatility in terms of trade and thus also to higher volatility in income. Bacchetta *et al.*

(2009b) also emphasize the importance of geographical diversification of exports to reduce volatility resulting from country-specific shocks.

A few studies have already looked at the role of export concentration during the current crisis. Te Velde *et al.* (2009) find that in low-income countries where exports to high-income countries comprise a large component of GDP, reductions in trade were particularly strong. The IMF (2009b) suggests that exporters that were less diversified were hit even harder, particularly when export goods were relatively income elastic. Sub-Saharan African countries primarily focused on oil exports (such as Angola, the Democratic Republic of the Congo and Nigeria) experienced marked declines in their exports as US demand for oil fell (Kandiero and Ndikumana, 2009). Furthermore, shrinking demand for consumer durables and investment goods reduce export volumes of commodities such as iron and steel via global supply chains (Francois and Woerz, 2009). This was the case in Ukraine, the country discussed in this section. In some developing countries (such as Laos and Bangladesh), where simple manufactured goods comprise a large component of exports, the high income elasticity of demand of these goods contributed to a large decline in exports (Meyn and Kennan, 2009).

Ukraine: Export diversification and the impact of the global crisis[4]

Impact of the crisis

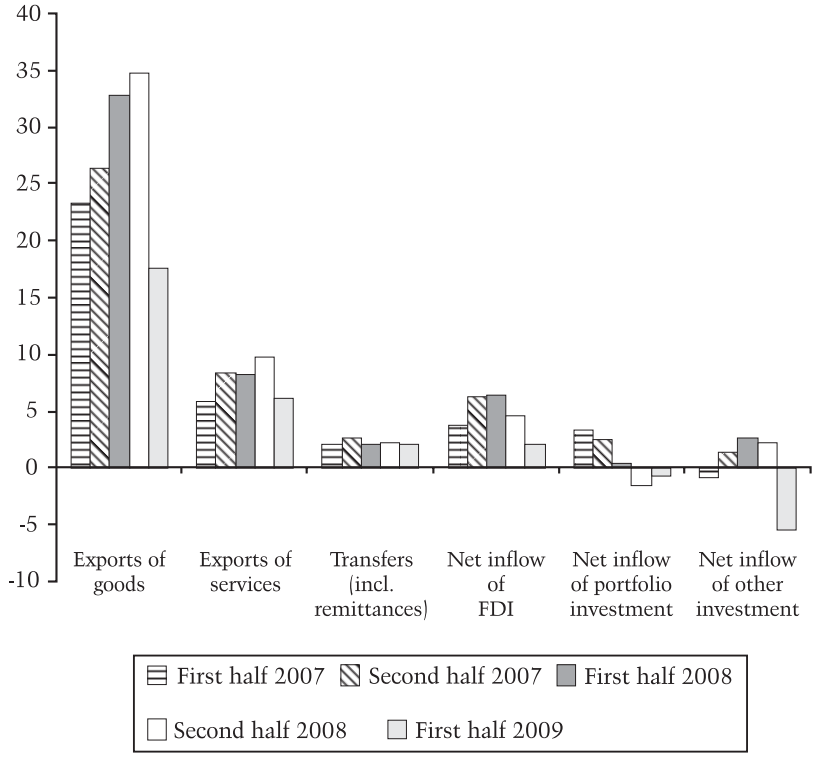
According to the latest IMF data,[5] Ukraine's GDP shrank by 14 per cent in real terms in 2009. For 2010, moderate recovery of growth, at around 3 per cent, is predicted, but at this pace it would take five years for Ukraine to return to its 2008 GDP level.

As shown in Figure 3.1, the first signs of crisis in Ukraine appeared in the second half of 2008, when net flows of portfolio investment turned negative and FDI inflows also began to decline. The category other investment contains foreign currency held by Ukrainians outside the banking system, which declined very strongly. Transfers, such as remittances from Ukrainians working abroad, seem to have held up during the crisis. However, the main shock in the real economy occurred in the

first half of 2009, when the value of merchandise exports collapsed by 50 per cent and services exports by 37 per cent.

Figure 3.1

Ukraine: Impact of the global economic crisis by balance of payment positions, 2007-09 (US$ billion)



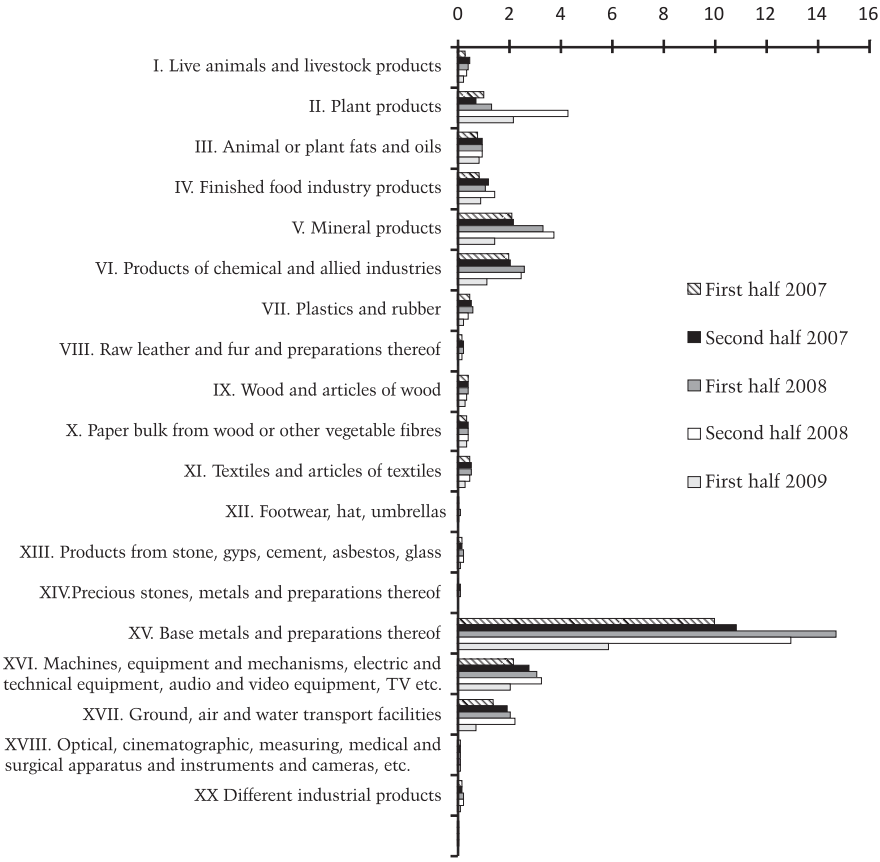
Source: Ukraine State Statistics Committee.

Figure 3.2 breaks down the export shock by sector of the economy. The strongest impact, both in absolute and relative terms, was in the sector base metals and preparations thereof, which in 2008 accounted for 41 per cent of total exports. In the first half of 2009, exports in this sector were 55 per cent below their value in the second half of 2008 and 42 per cent below their value in the first half of 2007. Thus, the shock was not simply a reversal of positive trends in 2008 but a very significant decline in Ukraine's main export industry. A decline of similar relative magnitude

took place in the sector chemical products, while the decline in mineral products was also very sizeable, but to a large extent a reversal of extreme increases in 2008. The drop in the machines, equipment and mechanisms sector was not quite as large, but exports of transport facilities also declined very strongly. Plant products, mainly grain and oil seeds, experienced a very strong increase in 2008, probably driven by the hike in global food prices, and although they declined in the first half of 2009, they remained substantially higher than in 2007. Other export sectors are very limited in size.

Figure 3.2

Ukraine: Change in exports by product category, 2007-09 (US$ billion)



Source: Ukraine State Statistics Committee.

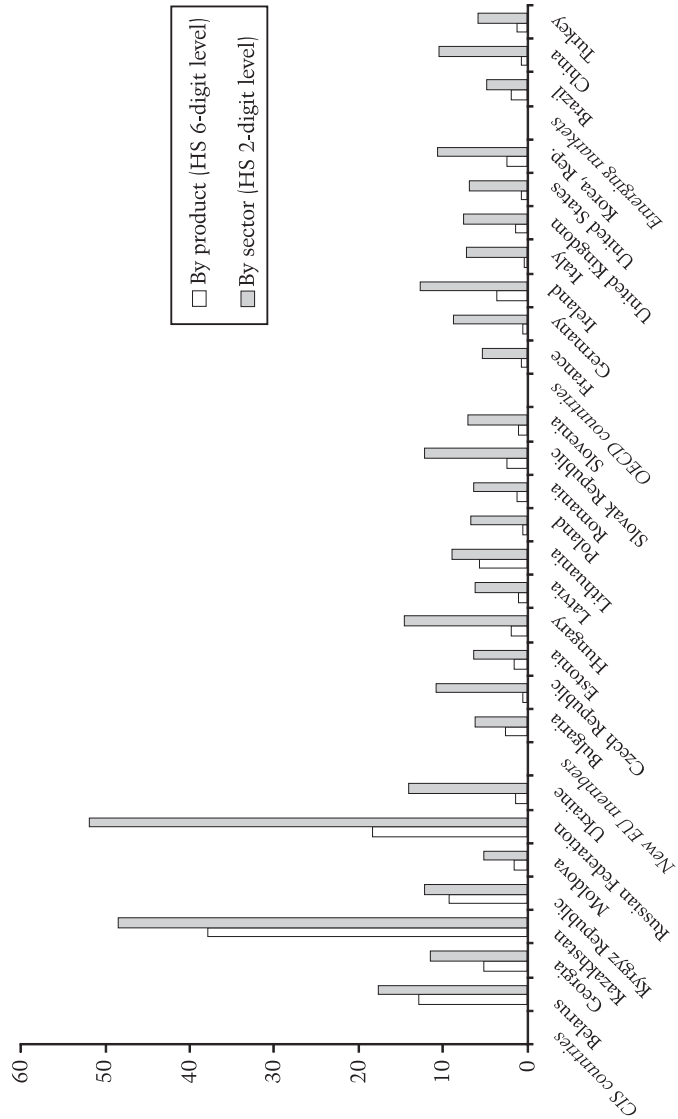
The role of export concentration

Figure 3.3 presents the Herfindahl index of product concentration for Ukraine in comparison with a number of other countries. It also presents an alternative measure of the Herfindahl index, calculated at the sectoral level (that is, at the 2-digit HS chapter headings). The difference is that the first Herfindahl index measures differentiation at the product level—the way that exports are distributed between approximately 6,000 different types of products—whereas the second one only looks at differentiation within 100 sectors. If, for example, a country has sizeable exports in a number of different products, but most of these products fall into the same sector, it would compare well in terms of diversification on the first indicator, but less so on the second indicator.

Among the CIS countries, many of which have export portfolios heavily concentrated on hydrocarbons, Ukraine is the one with the lowest export concentration at the product level. Ukraine's level of product concentration is similar to that of most Eastern European new EU Member States, but slightly above that of most OECD countries, such as Germany, Italy, France and the United States. Ukraine is more diversified in terms of products than Brazil, but less than China. However, if the Herfindahl index is defined at the sectoral level, Ukraine's degree of export concentration increases significantly, both in absolute terms and in comparison with other countries. On this index, Ukraine's export concentration is, among CIS countries, only exceeded by Belarus and the hydrocarbon exporters Russia and Kazakhstan (Figure 3.3). In all the other comparator groups, only Hungary has a higher level for the sectoral Herfindahl index. This indicates that while Ukraine's exports are relatively well diversified in terms of products, the degree to which most of them fall into just a few sectors (mainly base metals and preparations thereof, mineral products, machines and chemical products) is high in international comparison. Unfortunately for Ukraine, these sectors were among those that experienced the strongest contraction in world demand. The base metals and preparations thereof sector is also one characterized by a relatively uncertain trade policy environment. The sector has traditionally been one of the sectors most affected by anti-dumping investigations. During the crisis, anti-dumping investigations regarding iron and steel imports

Figure 3.3

Ukraine: International comparison of Herfindahl index of export product concentration (percentages)



Source: Authors' calculations based on data from COMTRADE for 2008.

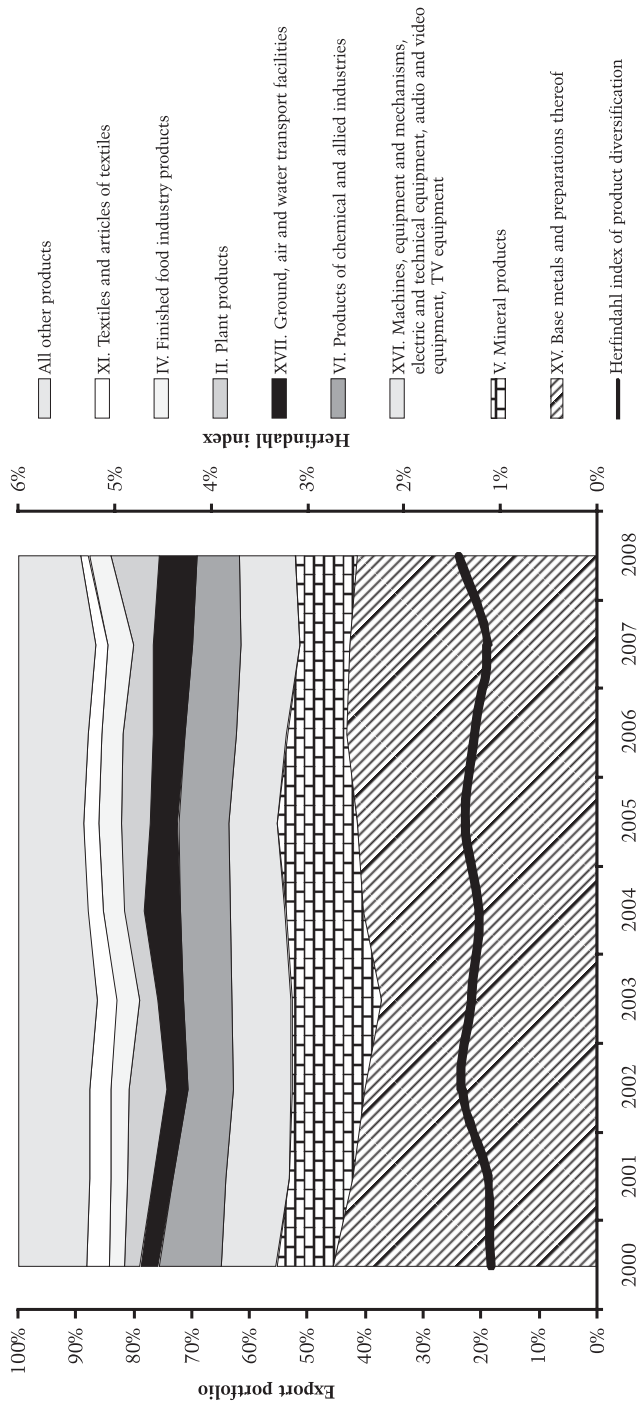
increased and Ukraine was among the most frequently targeted exporting countries (see Chapter 4).

Throughout the past decade, world market conditions have been very favourable for Ukraine, with the world market for all of Ukraine's large export sectors achieving high average annual growth rates (base metals and preparations thereof: +16 per cent; mineral products: +22 per cent; machines: +9 per cent; chemical products: +14 per cent). As a result, Ukraine experienced average annual export growth of more than 20 per cent over that period. But this period of growth was not exploited to diversify the country's economic structure. In fact, one of the remarkable features of Ukraine's export portfolio is that it remained practically unchanged during the past decade. Figure 3.4 shows that Ukraine did not establish any sizeable new export sectors between 2000 and 2008. Base metals and preparations thereof, mainly iron products, remains by far the most important export sector, accounting for around 40 per cent of total exports. Mineral products, machines and chemical products are all around 10 per cent of total exports, meaning the four largest sectors combined account for about 70 per cent of total merchandise exports. All these sectors typically rely heavily on traditional heavy industry.

With respect to geographical diversification, a similar argument can be made as for product *vs.* sectoral diversification: Ukraine's exports are diversified among a reasonably high number of countries. In fact, measured by a Herfindahl index based on the share of each destination in a country's total exports, Ukraine compares favourably with most other CIS countries, and also with some of the new Eastern European EU Member States. However, much like the way in which most of its export products are concentrated in a few sectors, most of Ukraine's export destinations are in its own region. In 2007, the CIS regions, the European Union and Turkey jointly accounted for 73 per cent of Ukraine's exports (data from Ukraine State Statistics Committee). Figure 3.5 shows how exports performed across destination regions during the crisis. In 2008, there was still substantial growth in exports across most regions. The collapse in 2009 was particularly strong in the United States, where the crisis originated, resulting in a dramatic reduction in exports to the United States. There were also very steep reductions in exports to Ukraine's main trading partners in the CIS region,the European Union and Turkey, which was the

Figure 3.4

Ukraine: Composition of export portfolio, 2000-08 (percentages)

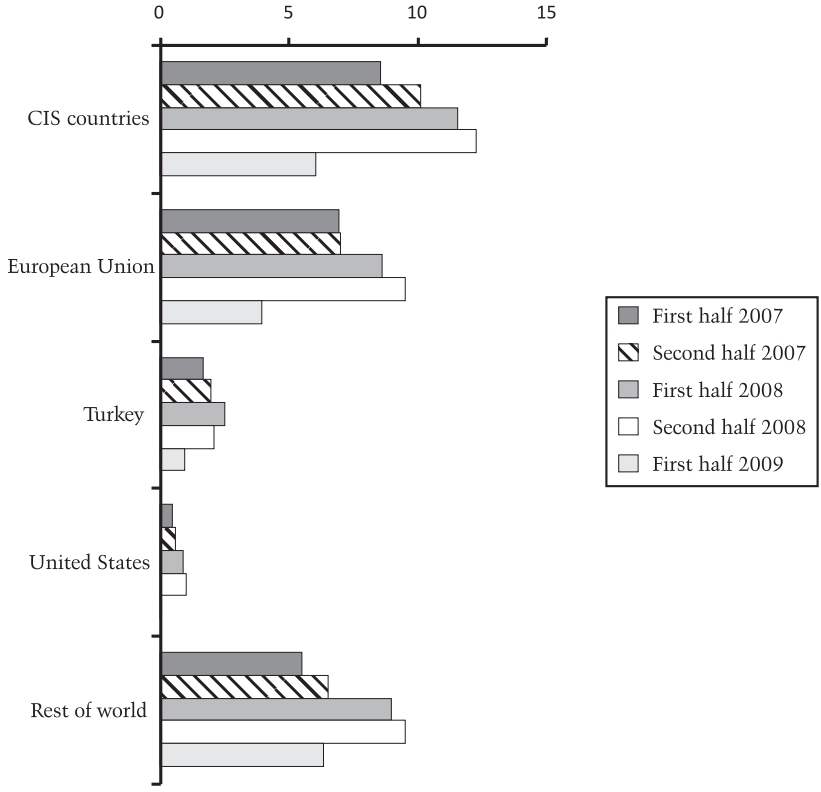


Source: Authors' calculations based on data from COMTRADE.

main driver for the very strong overall export contraction. Interestingly, exports to the rest of the world contracted much less, and—compared with the first half of 2007, before the hike in commodity prices—even grew slightly. Exports to important emerging markets such as China and India continued to grow throughout the crisis, but were too small to make a difference in total exports. It thus appears that Ukraine was unlucky in two ways: being strongly exposed to both the types of exports and the markets that contracted particularly strongly during the crisis. Beyond the immediate impact of the crisis, accessing new dynamic markets for its export products will remain an important challenge for Ukraine to ensure continued export growth in the future.

Figure 3.5

Ukraine: Change in exports by destination, 2007-09 (US$ billion)



Source: Ukraine State Statistics Committee.

Impact of the crisis on employment

Table 3.3 presents the available information on the impact of the crisis on Ukraine's labour market. Unfortunately, this data is reported using a slightly different classification system than the sectoral trade data so a direct comparison between sectors is not possible. The largest sectors in terms of employment are education and health and social work, with 1.6 and 1.3 million people employed respectively. These two sectors do not seem to have been affected by the crisis as total employment increased slightly in 2009. Given that a lot of employment in these sectors is public, there may well be a delayed effect if the impact of the crisis forces the government to cut public spending. The largest relative changes in terms of employment were registered for construction (-26 per cent), non-metallic mineral products (-26 per cent), machinery and equipment (-21 per cent), other manufacturing (-22 per cent) and motor vehicles and transport equipment (-20 per cent). Construction is to a large extent a non-tradable sector, and while some negative secondary effects may have taken place through the trade channel, it seems more likely that the main impact of the crisis was through financial channels and the turmoil in international housing markets that spurred the crisis.

A similar pattern is seen in changes in wages, but when interpreting the wage changes it is important to bear in mind that these are nominal wage changes and that the consumer price level increased by 17 per cent over the same period. Also, data from the Ukraine State Statistics Committee indicates that wage arrears more than doubled in 2009 compared with 2008, to UAH 1.6 billion (roughly US $200 million). Table 3.3 shows that in terms of wages, construction was again the sector characterized by the highest losses, at -22 per cent in nominal terms. Motor vehicles and transport equipment (-15 per cent), non-metallic mineral products (-15 per cent) and other manufacturing (-11 per cent) also experienced significant contractions in nominal terms. All sectors except other community, social and personal services (+20 per cent) and electricity, gas and water supply (+17 per cent) experienced real wage declines, as nominal wages either decreased or increased less than prices. Based on this data, there does not appear to be a pattern in which sectors that experienced a strong decline in wages were able to retain more workers.

Table 3.3

Ukraine: Sectoral impact of the crisis on the labour market

	Total employment (thousand)	*Employment change 2008–09 (Aug)*	*Average wage 2008 (thousand UAH / month)*	*Wage change 2008–09 (Jan–Aug) (%)*
A, B: Agriculture, hunting and forestry; fishing	794	-9%	975	5
C: Mining and quarrying	480	-7%	2 677	7
15,16: Manufacture of food products and beverage; manufacture of tobacco products	436	-11%	1 619	4
17,18: Manufacture of textile; manufacture of wearing apparel; dressing and dyeing of fur	89	-15%	1 018	0
19: Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	19	-9%	1 035	9
20: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	40	-16%	1 353	-1
21,22: Manufacture of paper and paper product; publishing, printing and reproduction of recorded media	72	-11%	1 949	5
23: Manufacture of coke, refined petroleum products and nuclear fuel	50	-9%	2 689	3
24: Manufacture of chemicals and chemical products	119	-9%	2 055	-7
25: Manufacture of rubber and plastics products	55	-17%	1 593	-8
26: Manufacture of other non-metallic mineral products	149	-26%	1 818	-15
27,28: Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment	407	-15%	2 411	-6
29: Manufacture of machinery and equipment NEC	293	-21%	1 800	-8
30,31,32,33: Manufacture of office, accounting and computing machinery; manufacture of electrical machinery and apparatus NEC; manufacture of radio, television and communication equipment and apparatus; manufacture of medical, precision and optical instruments, watches and clocks	165	-12%	1 629	-2
34,35: Manufacture of motor vehicles, trailers and semi-trailers; manufacture of other transport equipment	229	-20%	1 900	-15

contd...

...contd...

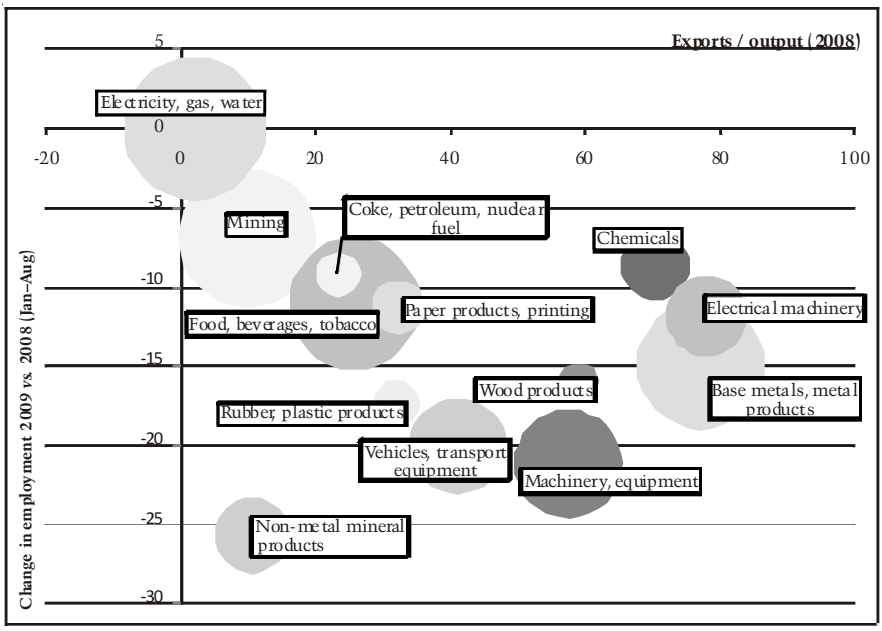
	Total employment (thousand)	*Employment change 2008–09 (Aug)*	*Average wage 2008 (thousand UAH / month)*	*Wage change 2008–09 (Jan–Aug) (%)*
36: Other manufacturing	69	-22%	1 343	-11
E: Electricity, gas and water supply	516	0%	2 112	17
F: Construction	497	-26%	1 832	-22
G: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	947	-13%	1 513	4
H: Hotels and restaurants	94	-6%	1 236	5
I: Transport, storage and communications	974	-5%	2 209	7
J: Financial intermediation	339	-19%	3 748	8
K: Real estate, renting and business activities;	631	-3%	2 095	7
L: Public administration and defence; compulsory social security	627	1%	2 591	0
M: Education	1 642	1%	1 451	15
N: Health and social work	1 267	1%	1 178	14
O: Other community, social and personal service activities	389	-8%	1 518	20

Source: Ukraine State Statistics Committee.

Figure 3.6 plots the change in employment by sector against the share of the sector's output that is exported.[6] The size of each bubble corresponds to total employment in the respective sector. This figure illustrates two important phenomena. First, job losses affect virtually all sectors of the economy except for those with very high public involvement (education, health and social work, public administration). Second, there appears to be a certain trend for higher employment losses to occur in sectors with higher export shares, but there are important outliers to this trend. In particular, the sector with the highest employment losses, non-metal mineral products (-26 per cent), is among those with the lowest export exposure.

Figure 3.6

Ukraine: Employment change versus share of output exported, by sector (percentages)



Note: The size of each bubble corresponds to total employment in the sector.

Source: Authors' calculations based on data from Ukraine State Statistics Committee.

Four explanations can be put forward for the two phenomena:

- As mentioned above, in some sectors (such as construction) employment has been negatively impacted through channels other than trade.
- Government interventions during the crisis have affected sectors differently. In particular, a memorandum of mutual understanding between the Government and metallurgical companies was signed in 2008. In this memorandum, producers took the obligation to maintain production, employment and wages at agreed levels. In exchange, the Government guaranteed to provide the sector with cheap credit resources to support domestic consumption of metal products, freeze transportation tariffs, reduce tariffs for electricity and provide VAT refunds within five days of presenting the declaration for the previous month.
- Reduced activity in exporting sectors also affects suppliers to these sectors. This indirect effect of trade is likely to have played an important role in Ukraine; the metallurgy sector alone consumes 88 per cent of the country's coke production, 25 per cent of fuel-energy mineral mining, 68 per cent of other mineral mining, 15 per cent of non-metallic mineral products and 15 per cent of electricity, natural gas and water. Beyond that, the metallurgy sector significantly influences the development of infrastructure, in particular transport, and construction.
- Lower employment, reduced wages or delays in wage payments in exporting sectors affect incomes and thus reduce demand for the products provided by other sectors, through the so-called "income-induced effect".[7]

Conclusions

The crisis was truly global in nature and affected almost all trade, so no degree of export diversification could provide complete protection against its impact. After a phase of high export growth, Ukraine was hit hard by the crisis, including a very sizeable shock to its main export sectors. The example of Ukraine illustrates that strong export performance is not necessarily a reflection of an underlying strong and resilient

economic structure. In Ukraine, exports grew significantly in the decade preceding the crisis, but the country failed to diversify in terms of both products and export destinations, which made the economy very vulnerable to external shocks. An increased focus on building an innovative and dynamic economy is required for the future. The analysis in this section has also shown that the employment effects of export shocks, even if they are temporary, are not restricted to workers in the sectors that are directly affected, but are likely to spread quite rapidly through the economy. The relative importance of such secondary effects will be further discussed in the case studies of India and South Africa (Section 3.4).

3.3 Liberia and Uganda: Interaction between global food and commodity price inflation in 2007/08 and the global economic crisis of 2008/09

Chapter 2 (Section 2.2) has highlighted how the combination of extreme price increases for many food items and commodities and the subsequent crash during the global economic crisis have led to substantial volatility in world markets. Economic literature suggests that volatility is generally bad for economic growth. For example, Ramey and Ramey (1995) find a negative relationship between volatility and growth in a sample of 92 countries and argue that this is because volatility creates uncertainty, which reduces innovation. Aizenman and Marion (1999), in a study covering mainly developing countries, find that volatility suppresses private investment. Aghion *et al.* (2004) build an endogeneous growth model that predicts a reduction in research and development investment due to volatility if companies are credit-constrained. These findings indicate that temporary shocks and increases in volatility can have long-term effects.

While most of the relevant literature is focused on the investment decisions of companies, the rapid assessment reports on Liberia and Uganda presented in this section show that food and commodity price volatility during the crisis also had an impact on household investment decisions. Negative income shocks can, for instance, lead to migration or influence decisions regarding schooling of individual household members, with possible long-term consequences for a country's economic structure and growth performance.[8] The studies also touch upon another

phenomenon that can perpetuate the negative effects of volatility: the stickiness of prices and wages, and differences in their upward and downward flexibility. As Liberia and Uganda were hit by both the food crisis and the subsequent financial crisis, the following subsections cover the impact of this twin-crisis and the resulting volatility faced by households.

Liberia: Hit hard at the wrong time[9]

The trade shock

Liberia's merchandise exports, totalling US $254 million in 2008, according to the Central Bank of Liberia, are very heavily concentrated in rubber, which accounted for roughly 80 per cent of total exports in 2008. Imports of US $768 million comprised food products (26 per cent, mainly rice), machinery and equipment (26 per cent) and petroleum products (20 per cent).

On the export side, Liberia benefited from high rubber prices during the 2007/08 commodity price inflation, but then was affected very negatively at the onset of the global economic crisis, when the rubber price dropped by over 60 per cent. Other commodity prices—such as iron ore, palm oil and diamonds—have also fallen. These currently constitute a small fraction of the total value of Liberia's exports. However, significant increases in the production of iron ore, palm oil and timber were expected to occur in 2009/2010 or to accelerate in the near future.

There are no formal terms of trade statistics for Liberia and high-frequency information on trade flows is not readily available. Mirror data (imports from Liberia reported by trading partners) from the European Union and the United States show an increase in export revenue by over 50 per cent for August-October 2008 *versus* the same three months in 2007, and eventually a 55 per cent decline by April-June 2009.

On the import side, Liberia suffered heavily from the price hikes in crude oil and food prices in 2007/08. The subsequent global downturn provided at least some temporary relief with respect to import prices. It is also important to bear in mind that Liberia's imports are roughly three times its exports (with the difference financed mainly by aid), so with

respect to the terms of trade, the price drop for imports resulting from the global economic crisis may well have offset the negative impact on exports.

Food price inflation, according to the Central Bank of Liberia, was at 24.6 per cent in the second quarter of 2008, and declined to 3.2 per cent in the second quarter of 2009. This may have to some extent been driven by the fall in world market prices for food. However, the Government also intervened and put pressure on importers to keep rice prices low, in accordance with Liberia's more than three-decades-old policy to control domestic rice prices. Furthermore, the Government of Japan donated US $30 million worth of rice to Liberia. It is also important to note that even though food prices did not continue to rise as fast as they had before, they did not fall or return to their pre-inflation levels.

The crisis and the resulting decline in international commodity prices had a serious negative impact on Liberia's government revenue. International trade taxes made up about half of total tax revenue, and ad valorem taxes on imports represent a significant component of these trade taxes. Thus, while lower import prices may have been favourable to consumers, they also translated into a significant reduction in government revenue. Furthermore, the strong volatility in commodity prices added to the complication and uncertainty of budget planning in a country that, given its overburdening debt level and the requirements of the debt relief process, currently has no means to compensate for revenue losses.

Information on the labour market impact of the crisis in Liberia remains scattered in the absence of any formal labour market data. Some anecdotal labour market evidence on job losses in the most important sectors of the economy is presented in the following subsections. The broad picture is that the global economic crisis has led to some layoffs, and also to deteriorations of working conditions. In some cases, workers were dismissed and then rehired on a casual basis with higher insecurity and without the benefits they had been entitled to before. The main impact, however, may be through delays in crucial investments that were expected to generate employment in the coming years.

The following subsections present the findings of the rapid assessment on a number of crucial sectors of the Liberian economy (rubber, iron ore and rice) in order to analyze the impact of volatility in world market prices

on present employment and the prospects for employment creation in the future.

Rubber

Rubber is currently Liberia's most important export commodity by far—the value of rubber exports totalled US $266 million, or about 80 percent of total exports, in 2008. The five largest companies in Liberia operate in the rubber sector, and it is estimated that more than 20,000 people are employed by commercial rubber farms and up to 60,000 smallholder households are involved in some way in growing rubber trees. Exports grew strongly in 2008 following favourable world market conditions, but with the onset of the crisis, the world market price for rubber and the quantity of Liberia's rubber exports declined substantially. Demand for tyres directly influences demand for rubber, so demand is strongly linked to the health of the global automobile industry—which was hit hard by the crisis.

Figure 3.7 presents selected indicators for the world market price for Liberian rubber. According to the World Bank's Global Economic Monitor database of world commodity prices, the world market rubber price peaked at US $3.22 per kilogram in June 2008 and then dropped dramatically in the last quarter of 2008 to reach US $1.20 in December 2008. Subsequently, it recovered slowly, reaching US $1.69 in May 2009. Predictions from the Global Economic Monitor suggest that it will continue to increase slowly, but will remain well below its peak during the years of the commodity boom. Trends in unit values of EU rubber imports from Liberia largely confirm the validity of these world market figures for Liberian rubber, although with a time lag of about three months.

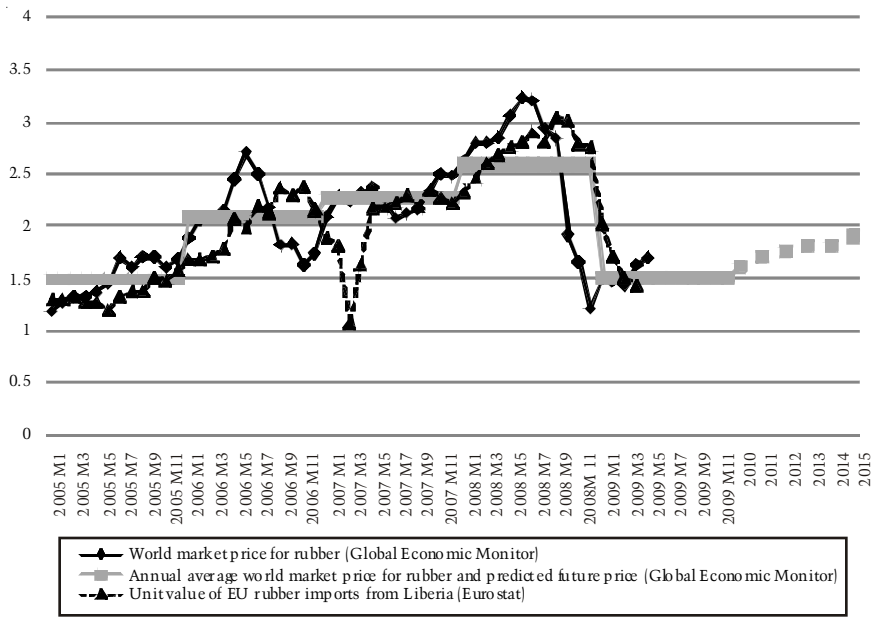
According to mirror data from the European Union and the United States, the drop in Liberian rubber exports in the first months of 2009 was significant, not just in value, but also in terms of the quantity exported. In the last three months with data availability (February-April 2009), exports to the European Union declined by 56 per cent in value and 25 per cent in quantity terms compared with the same months in 2008.

The rapid assessment found that companies in the rubber sector were strongly affected by the fall in prices and cancelled contracts with external suppliers. These cancellations led to some cutbacks in the employment of

contract workers. Estimates at one plantation indicated that up to 2,000 workers, most of them contract workers, had been laid off. Smallholder rubber plantations were also affected and the impact led to some shutdowns and reductions in activity. The Ministry of Agriculture indicated that many of the smaller Liberian-owned producers had to lay off people and significantly downsize their operations. Labour relations on some plantations became very tense, with unrest on two major plantations, leading to destruction of a police station at one site and the vandalizing of another's fleet of vehicles. According to workers' representatives, some workers who had been laid off were rehired on a casual daily-wage basis, without the usual benefits of housing, free schooling for children, a rice allowance and medical support.

Figure 3.7

Liberia: Selected indicators of world market price for rubber, 2005-2014 (US$/kilogram)



Source: ILO (2009d), based on data from Global Economic Monitor and Eurostat.

The crisis struck Liberia at a crucial time for the rubber industry because the Government was beginning to renegotiate concession agreements with two of the major plantations. Some sources interviewed for the assessment argued that companies had used the crisis and the resulting decline in world market prices for rubber as an argument to push for more favourable terms, and the bargaining position of the Government was weakened given the urgent need to secure employment in the midst of the crisis. Of particular concern is the companies' resistance to provisions in the concession agreements that require them to provide finance and other support to smallholders to replant rubber trees. While world market prices for rubber are already recovering, an unfavourable outcome of the concession negotiations could affect the sector's future development. Among smallholders, insecurity increased, creating uncertainty on whether to invest in replanting of rubber trees given the high volatility of prices. Rubber trees are a long-term investment as it takes about seven years before they can be harvested.[10] Some smallholders are said to have already cut down their old rubber trees to plant other crops instead.

Iron ore

Liberia was not producing iron ore in 2009, but it has substantial reserves of iron ore and used to be an exporter before the civil war. At the time of the assessment, there were two international companies already holding mining concessions, and a third concession was being auctioned. One company had already begun its investment and was expecting to start shipping iron ore in 2011.

As has been discussed in Chapter 2, the world market prices for iron were extremely volatile between 2007 and 2009, experiencing strong increases followed by a sharp decline at the onset of the global economic crisis. Unit values for EU iron ore imports (from the rest of the world) of the type exported by Liberia before its civil war followed this trend, reaching a peak of US $116 per tonne in December 2008 and dropping to US $89 in March 2009. Import data from the European Union shows a dramatic drop in demand for iron ore after the beginning of the economic crisis. After being relatively stable in quantity terms between 2005 and early 2008, imports into the European Union dropped by 55 per cent in

value terms and 46 per cent in quantity terms between the first three months of 2008 and the first three months of 2009.

Although iron ore production had not yet resumed in Liberia at the time the crisis unfolded, the drop in the world market price as well as the tightening of international credit had negative impacts on investment for future production. One concession-holder put on hold its investment in the rehabilitation of a mine and transport infrastructure for exporting ore, leading to the layoff of 1,200 contract construction workers. It was reported that another company, after winning the bid for a concession, approached the Government and negotiated a reduction in the royalty fees, arguing that world market conditions had changed since the bidding process.

Companies apparently attempted to use short-term fluctuations in the world market price as an argument in their favour in dealing with the Government, whether to justify delays in agreed investments or to push for lower royalties. While the legitimacy of these arguments can be doubted given the long time horizon of investment projects and the fact that world prices for iron ore remained above their 2007 level, the crisis put the Government in a weak bargaining position given the urgent need to secure employment and government revenue.

Rice

Rice is Liberia's most important food crop and has tremendous importance for food security and political stability in a country where, in 2006, 81 per cent of the rural population were found to be vulnerable to food insecurity, and another 10 per cent acutely affected by it (Republic of Liberia, 2008). Since the rice riots of 14 April 1979, rice has been considered a "political" crop.[11] Regardless of the world market price, Liberian presidents have made concerted efforts to ensure that the price of rice is affordable by the population. As such, the price is determined by the Government through the Ministry of Commerce and Industry.

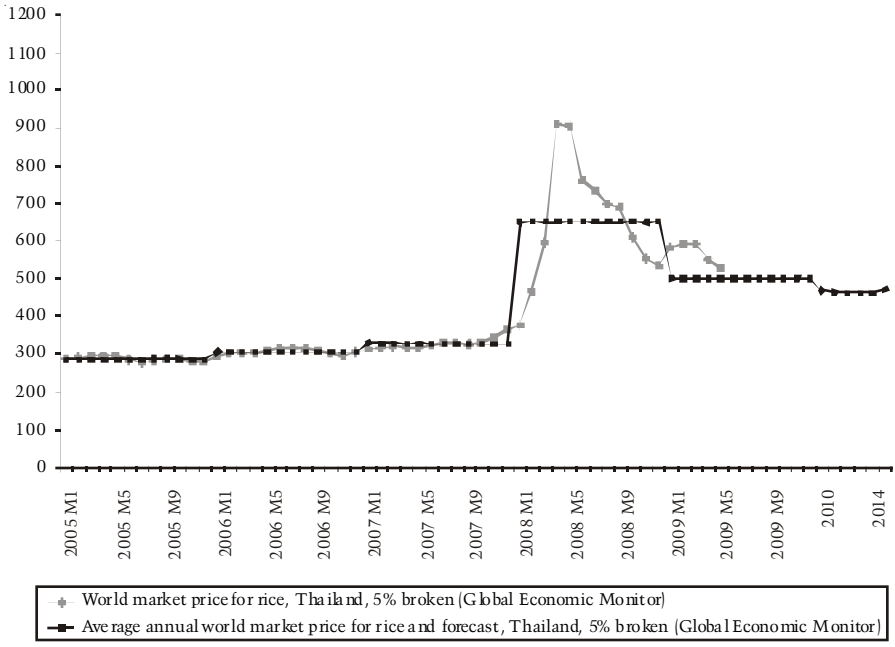
Ad hoc calculations based on figures reported by the Ministry of Agriculture of the Republic of Liberia (2006) indicate that employment in rice cultivation was equivalent to about 380,000 full-time jobs. Given that rice is farmed mainly by smallholders, who often plant a number of different crops, it is reasonable to assume that these jobs will be spread

between a much higher number of people, who are engaged in multiple livelihood activities. Based on estimates in the same report, if Liberia were to reach self-sufficiency in rice (assuming a constant labour to land ratio), this would generate the equivalent of an additional 470,000 jobs.[12] While these are extremely rough estimates, they demonstrate that rice cultivation is not only important for food security, but also has tremendous potential for employment creation.

As shown in Figure 3.8, the Global Economic Monitor reports that the price for a tonne of rice (Thailand, 5 per cent broken) was stable for years at around US $300, but then tripled in 2008 to reach US $907 in April 2008. The price then fell back, but remained above $500, and was showing no signs of returning to its pre-2008 levels in mid-2009.

Figure 3.8

Liberia: Selected indicators of the world market price for rice, 2005-14 (US $/tonne)



Source: ILO (2009d), based on data from Global Economic Monitor.

Liberia is a net importer of rice. According to the Ministry of Commerce, in 2008 almost US $200 million had to be spent on importing rice due to the spike in international food prices and the continuing strong demand that could not be met by domestic production.

Three major Liberian companies were importing rice into the country at the time the crisis unfolded. Importers noted that they lost close to US $20 million in the first quarter of 2009 as a result of the fluctuations in the global price of rice and pressures from the Government to keep domestic rice prices low. The companies were subsequently not in the position to pay their suppliers. These payments have been rescheduled over a period of three years, beginning late 2009, but they severely endanger food supply in the future as importers are becoming more restricted in their ability to finance major shipments.

Revitalizing the agricultural sector remains a top priority for Liberia, which was once a food exporter. Rice has tremendous importance for food security, and it is also arguably the only sector that has the capacity to create employment on a sufficient scale to absorb the country's growing labour force. However, the sector is currently affected by a number of problems, including undefined land tenure rights and deficient rural infrastructure, and investment to improve productivity is badly needed. The fluctuations in world market prices for rice have demonstrated the urgency of resolving these issues. They have burdened households, producers and importers with substantial adjustment costs for unpredictable price fluctuations, which in Liberia also increases the risk of renewed conflict and violence.

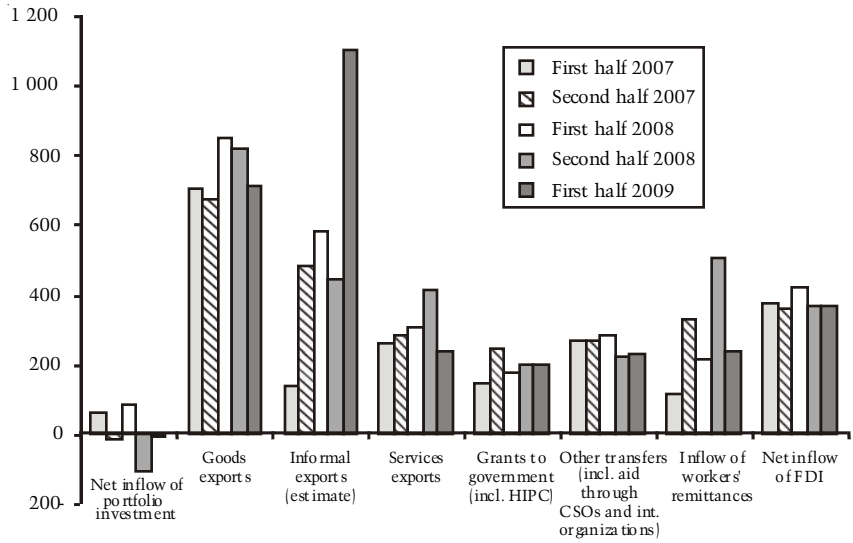
Uganda: Improving terms of trade and falling wages[13]

The trade shock

Uganda's exports, mainly coffee (24 per cent), manufactured goods (14 per cent), machinery (11 per cent), crude materials (8 per cent), beverages and tobacco (7 per cent) and fish (7 per cent), totalled US $1.7 billion in 2008. Imports were mainly machinery (28 per cent), mineral fuels (19 per cent), manufactured goods (18 per cent) and chemicals (14 per cent), and totalled US $4.5 billion in 2008.[14]

Figure 3.9

Uganda: Channels of crisis impact, 2007-09 (US$ million)



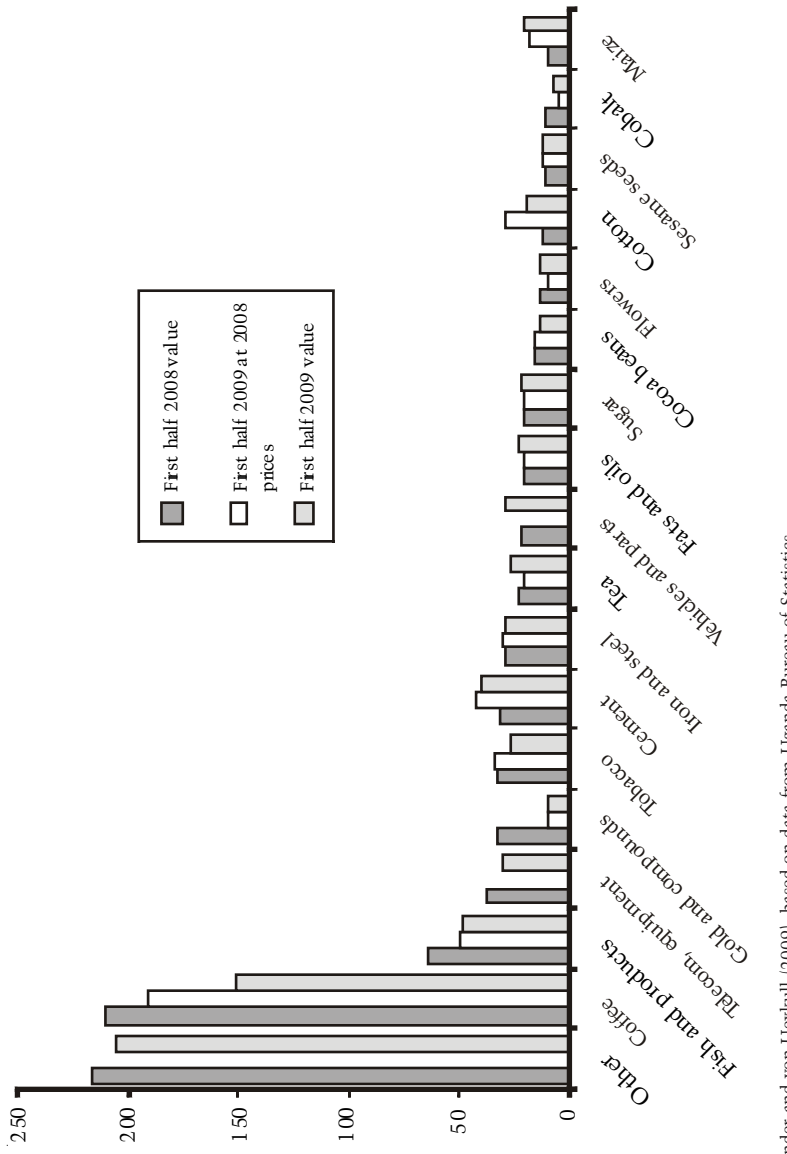
Source: Sender and von Uexkull (2009), based on data from Bank of Uganda.

Figure 3.9 presents an overview of selected balance of payment aggregates to demonstrate the role of trade and other international transfers in transmitting the crisis to Uganda. The first impact of the crisis was a substantial outflow of portfolio investment in the second half of 2009. Exports of goods increased quite substantially in the first half of 2008, but dropped somewhat in early 2009, although remaining above their 2007 level. This was more than offset by a massive increase in informal cross-border exports to neighbouring countries in the first half of 2009, which was fuelled by a strong depreciation of the Ugandan shilling. Services exports, which are mainly in tourism, suffered a significant decline in the first half of 2009.

Figure 3.10 details the change in exports by product group, and also distinguishes between value and quantity effects where possible.[15] The figure shows the changes for the most important individual product groups.[16] Coffee, the single largest export product, suffered a decline in value from US $210 million in the first half of 2008 to US $152 million in

Figure 3.10

Uganda: Export changes by product group, 2008-09 (US $ million)



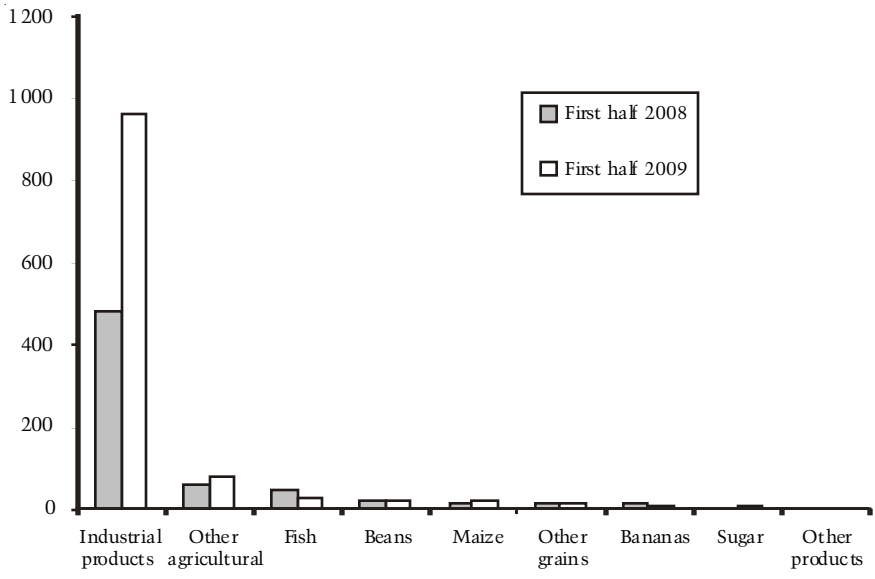
Source: Sender and von Uexkull (2009), based on data from Uganda Bureau of Statistics.

the first half of 2009. This was caused mainly by a decline in the world market price, but export volumes also contracted significantly; coffee exports in 2009 would have totalled US $190 if valued at 2008 prices. Reductions in fish, gold, flowers and cobalt exports can clearly be attributed to a contraction in export volumes rather than price effects. The assessment found evidence for supply-side problems with fish and flowers that were unrelated to the crisis. All other sectors experienced insignificant reductions, or even increases in exports.

Figure 3.11 presents information on the growth in informal exports, based on a survey conducted regularly at a number of land borderposts by the Uganda Bureau of Statistics. Most of the increase in informal exports was accounted for by industrial products; these increased from US $475 million to US $963 million between the first half of 2008 and the first half of 2009. Agricultural food exports, including beans, maize, sugar and other

Figure 3.11

Uganda: Informal export changes by product group, 2008-09 (US$ million)



Source: Sender and von Uexkull (2009), based on data from Bank of Uganda.

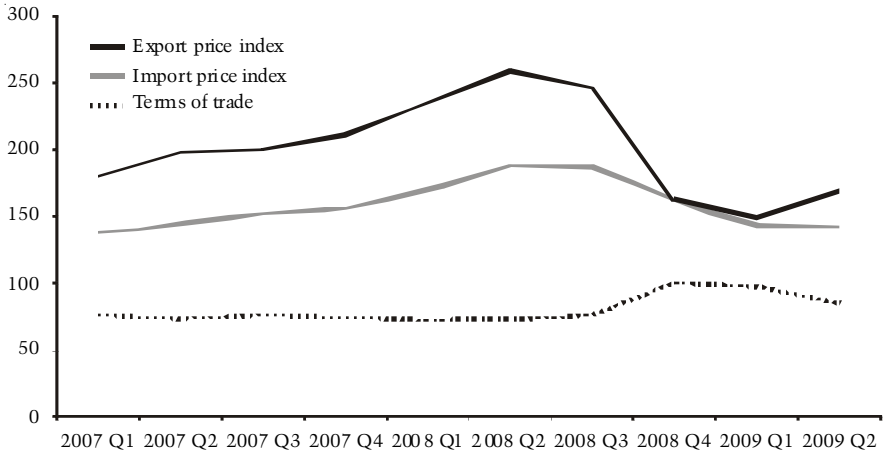
grains, also increased across the board, but from a much lower base and not as dramatically. Informal fish exports declined. The main trading partners in 2008 were Sudan (69 per cent), Democratic Republic of the Congo (15 per cent) and Kenya (8 per cent).

Informal exports cushioned the losses in world market exports and will probably continue to be an important part of Uganda's export portfolio. The strong increase in informal trade, especially with Sudan, demonstrates the potential for trade with a region that has close historical and ethnic ties with Uganda, a vast market with currently very little domestic productive capacity. However, it is striking that the massive expansion in regional trade in the first half of 2009 was driven entirely by informal exports.

The sustainability of these trade flows is questionable. The expansion in informal trade was not accompanied by a significant increase in industrial production in Uganda of the products exported, which means it is unlikely that the increase in trade was caused by the entrance of Ugandan companies into regional markets. Rather, it probably reflected ad hoc transactions by individuals or small traders, who saw an opportunity

Figure 3.12

Uganda: Export and import price index and terms of trade, 2007-09



Source: Sender and von Uexkull (2009), based on data from Bank of Uganda.

for profit in response to the sharp depreciation of the Ugandan shilling in late 2008 and early 2009. The rapid expansion in informal exports thus probably did not reflect a sustainable competitive advantage of Ugandan farms or firms to export to regional markets that would lead to employment creation in Uganda in the future. It may also be short-lived, given that the exchange rate began to appreciate in the second half of 2009.

Exchange rate and inflation

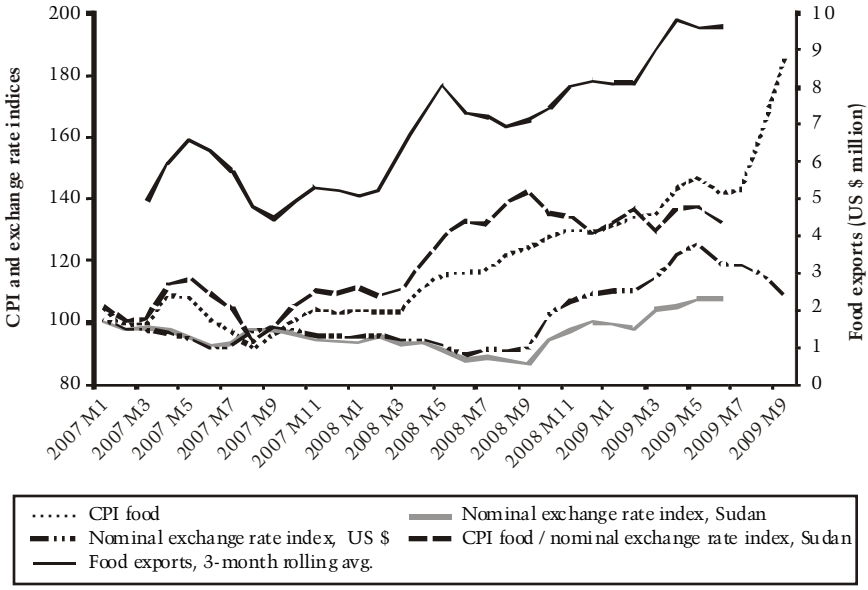
The price indices for imports and exports increased roughly proportionately in 2007 and the first half of 2008, leaving the terms of trade at a constant level. When the global economic crisis struck, the price index for imports declined by 43 per cent between the second quarter of 2008 and the first quarter of 2009, and the export price index declined by 23 per cent (Figure 3.12). Thus, Uganda's terms of trade improved during the crisis.[17] Perhaps surprisingly given the improvement in terms of trade, Uganda's exchange rate depreciated substantially during the crisis (Figure 3.13), with the value of the Ugandan shilling in US dollars declining by 28 per cent between August 2008 and May 2009, driven mainly by fluctuations in portfolio investments.

As shown in Figure 3.13, food prices in Uganda increased sharply from the middle of 2007 in the context of the global food price crisis, and continued to increase after the beginning of the global economic crisis, notwithstanding the drop in global food prices. A number of factors, both global and local, that pre-dated the global economic crisis have contributed to the acceleration of food inflation. These include increased demand for food imports in neighbouring Kenya and Sudan and shortages in regional production due to problems with flooding in some production areas and the delayed start of the rainy season, leading to severe drought in others. The exchange rate depreciation also contributed to maintaining high food prices in terms of the local currency. Uganda is a net exporter of food and, despite the strong increases in domestic food prices, has continued to export increasing amounts of food to neighbouring countries. In fact, with the strong depreciation of the Ugandan shilling against both the US dollar and the currencies of neighbouring countries, there were increased incentives to export food from Uganda to the region. Figure 3.13 shows this by presenting the food CPI divided by the bilateral

exchange rate with Uganda's main regional trading partner, Sudan. Since the beginning of the crisis in September 2008, the price of Ugandan food expressed in Sudanese currency decreased slightly, despite the strong domestic food price inflation.[18]

Figure 3.13

Uganda: Exchange rate, inflation and food exports, 2007-09



Source: Sender and von Uexkull (2009), based on data from Bank of Uganda and Uganda Bureau of Statistics.

Impact on households

No reliable high frequency wage and employment data is available for Uganda so it is not possible to track systematically the impact of the crisis on the labour market. In interviews and focus group discussions, Sender and von Uexkull (2009) found little evidence for employment losses that could be traced directly to the impact of the crisis, but there were some examples of employers increasingly hiring workers on a casual basis with no job security or benefits. They also found anecdotal evidence that nominal wages for most workers in Uganda, especially in the low-wage sector, had not been increased since 2007, notwithstanding sharp increases in food prices. In most cases, employers argued that because of the global

economic crisis, they could not afford to increase wages. Whether in each individual case this was true could not be determined, but in general the pessimistic climate resulting from the global economic crisis seems to have tipped wage bargaining power in favour of employers in Uganda.

Poor households suffered the most from the rapid increase in food prices since they spend a much larger proportion of their total expenditures on food.[19] The overwhelming majority of poor households in Uganda live in rural areas, where mean consumption expenditure per adult equivalent is about half that in urban households (Office of the Prime Minister of the Republic of Uganda, 2009), and the majority of rural households (about 60 per cent) are net purchasers of staple foods. Even before the 2007/08 price shock, average consumption in poor households was 28 per cent below the official poverty line; by early 2008, the rise in food prices had caused the severity of poverty to worsen—this average fell to 32 per cent below the poverty line.

Box 3.1

Policy responses to the crisis in Uganda and Liberia

Liberia is running a cash-budget, meaning that that Government can only spend what it earns in a given fiscal year. Thus in Liberia, there was no space for a fiscal stimulus to counteract the crisis. On the contrary, the crisis severely reduced government revenue through drops in taxes and royalties. As a reaction to the global economic crisis and the previous hike in food and commodity prices, the Government reduced corporate and personal income tax rates and abolished an import tariff on rice. However, given the Government's inability to borrow, these will have to be offset by either higher taxes or lower spending in other areas, so the net effect on households is not clear. Liberia is also maintaining a number of emergency employment programmes that pre-date the crisis.

In its 2008/09 budget, Uganda adopted an infrastructure investment programme planned over a timeframe of three years and financed partially by external borrowing. Thus, to some extent, a fiscal stimulus was already in place when the crisis hit. However, execution of the investment programme fell short of the planned expansion in 2008/09 and when the rapid assessment was conducted it was not clear whether the full expansion would take place in 2009/10. In the summer of 2009, the IMF saw room for an additional fiscal stimulus (IMF, 2009c). In terms of monetary policy, the Bank of Uganda intervened only at the margin to manage the decline of the Ugandan shilling by selling some US $64 million of its total of US $2.7 billion in foreign reserves but did not stop its depreciation by more than one-third of its US dollar value.

A number of underlying long-term problems contributed to the extreme vulnerability of the workforce that led workers to bear a

disproportionate share of the crisis in Uganda. These include a large discrepancy between the supply of and the demand for unskilled labour, caused by a rapidly growing workforce and underinvestment in key employment-intensive sectors; weak labour market institutions, including the absence of a decent wage floor and weak labour organization; insufficient education of labour force entrants; and a social protection system that only covers a small minority of the population.

Conclusions

The combination of the food and commodity price hikes in 2007/08 and the global economic crisis in 2008/09 have led to strong fluctuations in world market prices of goods that are crucial for many developing countries. The examples of Liberia and Uganda have revealed a number of mechanism through which this volatility has affected workers and their households. In most cases, the effects were negative, and may to some extent last beyond the immediate phase of the global economic crisis.

Investment uncertainty for producers played a crucial role in perpetuating the impact of the crisis, especially in Liberia. Global commodity price fluctuations before and during the crisis have illustrated the risks inherent in a development strategy that is mainly focused on export-oriented natural resource sectors, while relying on imports of basic food items. The study on Liberia has also highlighted another investment-related channel through which temporary volatility can have lasting effects: price drops in the world market and the urgent need to secure employment and income during the crisis have undermined the Government's bargaining position for concession agreements in a number of sectors. These concession agreements typically have a lifespan of over 20 years, so any concessions that the Government has to make to investors now—such as reductions in royalty payments, employment guarantees, infrastructure investment, or support to smallholders via outgrower schemes—could harm the country's development well into the future. The above cited literature on the impact of volatility on investment mainly focuses on the effect of volatility on levels of investment. The example of Liberia illustrates that volatility can also significantly affect the distribution of the returns from investments.

Both Liberia and Uganda experienced substantial increases in food prices in 2007/08, and despite the subsequent reduction in world food prices, the domestic prices did not return to their previous levels, and in Uganda even continued to increase. Nominal wages have not followed this increase in living costs, probably reflecting in part the fact that the elasticity of wages to GDP tends to be more responsive to negative GDP shocks than to GDP growth (ILO, 2008). As a result, both studies find evidence of deterioration in real income at the household level, especially for already poor households. Even if these shocks are temporary, they can have long-term adverse effects in terms of health damages through malnutrition and a decline in education, when children are taken out of school to contribute to family income. According to Bjorkman (2006), in Uganda this has been the case—mainly for girls—during previous economic downturns.

The two case studies found that food prices, while quick to adjust upward during the international food price hike, did not revert to their previous levels, even after the situation in the world market normalized. There were a number of reasons for this, including exchange rate fluctuations and regional supply issues. It is also important to bear in mind that food markets in developing countries are typically far from perfectly competitive, especially if food has to be imported. In both countries, food price inflation reduced the purchasing power of wage earners, affecting the poor disproportionately as they spend a high share of their income on food. In the absence of strong labour market institutions and an effective social protection system, the weakest members of society are very likely to bear an important share of adjustment to shocks.

3.4 India and South Africa: Secondary effects of the trade shock

A story of secondary effects

The Ukraine study presented in Section 3.2 touched upon the issue of trickle-through effects of the trade shock—caused by the economic crisis—on other sectors. However, with the methodology applied in that study, it was not possible to evaluate the full effect of the trade shock or to separate that effect from the effects of other mechanisms through which the crisis has been transmitted. Using quantitative methods, such as the one

presented here for India and South Africa, it is possible to estimate general equilibrium effects; that is, to estimate the employment impacts that go beyond the sector directly affected by the trade shock.

Impact of the trade shock on India and South Africa[20]

Methodology

The study on India and South Africa (Kucera *et al.*, 2010) uses social accounting matrix (SAM)-based Leontief multiplier models for the two countries. The models were shocked using the change in the volume of exports in each industrial sector in February-April 2009 compared with the same period in 2008 in order to estimate the effects of trade contraction on employment and income. Leontief multiplier models have been criticized for being static, but this is not a significant concern for the analysis presented here as it focuses on the short-term impact of a crisis-related shock. Such models are also relatively simple to set up, which makes them very suitable for use in informing the policy debate in crisis-situations, where rapid policy reactions are required. The approach chosen allows for the assessment of the effects of crisis-related changes in trade flows on factor income distribution. It also generates results by income group and by gender, and makes it possible to distinguish between the direct effects of the trade shock, indirect effects through input-output linkages among sectors and income-induced effects resulting in lower consumption spending. Annex 3 provides the technical description of the model.

Due to a lack of data availability at a sufficient level of detail from national sources, the export shock used for the simulations was defined based on imports from South Africa and India reported by the European Union (Eurostat) and United States (US International Trade Commission). This data is reported at the tariff-line level and includes quantity information, which made it possible to calculate constant price changes in exports. The exact procedure is also reported in Annex 3.

Previous studies based on similar models that analyzed the effects of trade on employment and incomes typically used a trade demand vector defined not just in terms of changes in exports, but also in terms of changes in net exports (exports – imports) relative to domestic production (Sachs and Shatz, 1994; Wood, 1994; Kucera and Milberg, 2003). In other

words, those studies model the effects of the changing structure of trade. The idea in those studies is that a reduction in imports, just like an expansion of exports, creates jobs as it reflects replacement of imports with domestic produce. However, the issue under question here is the effect of a one-off temporary shock, not a lasting structural change. It seems reasonable to assume that the steep reductions in imports during the crisis reflect a general drop in demand, rather than the replacement of imports with domestic products. Therefore, one would not expect to see a positive impact on employment creation or household income from the reduction in imports. To account for this, the trade demand vectors for the simulations are based on the change in exports, rather than net exports, and thus do not take into account the import contraction that occurred simultaneously.

India: Background

Between October 2008 and April 2009 (the last month of data covered by the study), the value of India's exports contracted in every month in comparison with exports in the same month of the previous year, by between -20 per cent and -40 per cent. Import growth turned negative in December 2008 at similar magnitudes. However, part of this reduction was a price effect, so the observations are not directly comparable with the volume trade shock used for the modelling exercise that is described below. The Reserve Bank of India also reported declines in service exports in the first quarter of 2009. While inflows of FDI remained relatively stable, there was a strong net outflow of portfolio investment as many foreign investors divested in the Indian capital market.

Real GDP growth slowed down when the crisis began, dropping to 5.8 per cent in the first quarter of 2009 as compared with 8.6 per cent in the same quarter of the previous year. While most sectors experienced positive growth, albeit slower, manufacturing contracted by 0.5 per cent in the first quarter of 2009, compared with a positive 5.9 per cent in the previous year.[21] Anecdotal evidence suggests that export-oriented sectors, such as jewellery and gemstones and textiles, were hit particularly hard. Construction, too, experienced a major slowdown. Tourism dropped significantly following the onset of the economic crisis and the terrorist attack on Mumbai in November 2008.

Only limited empirical information on the employment impact of the economic crisis is available for India. The most recent data at the time the study was written was from an ad hoc quarterly survey of selected industrial sectors conducted by the Labour Bureau of the Ministry of Labour and Employment. These numbers are presented in Table 3.4 and show a sharp drop in employment in October-December 2008 of more than half a million jobs, then some recovery in January-March 2009 and a further drop in employment in April-June 2009. Overall, job losses in the sectors covered are estimated at 827,000 since October 2008, but given that a number of new jobs have also been created, the net employment effect for the group of industrial sectors covered was -333,000. The sectors most affected were gems and jewellery, automobiles and textiles.

Table 3.4

India: Change in employment in selected sectors, April 2008 to June 2009

Sector	*Apr–Sep 2008*	*Oct–Dec 2008*	*Jan–March 2009*	*Apr–Jun 2009*	*Total since Oct 2008*
Textiles	206 000	-107 000	208 000	-154 000	-53 000
Leather	8 000	6 000	-33 000	7 000	-20 000
Metals	-1 000	-100 000	-29 000	-1 000	-130 000
Automobile	-8 000	-169 000	2 000	23 000	-144 000
Gems and jewellery	22 000	-159 000	33 000	-20 000	-146 000
Transport	7 000	4 000	-4 000	-1 000	-1 000
IT-BPO	258 000	66 000	92 000	-34 000	124 000
Handloom, powerloom	-14 000	-16 000	7 000	49 000	40 000
Total job losses	-23 000	-551 000	-66 000	-210 000	-827 000
Total net change	478 000	-475 000	276 000	-131 000	-330 000

Source: Kucera *et al.* (2010), compiled from various issues of the Report on the effect of the economic slowdown on employment in India, Labour Bureau, Ministry of Labour and Employment, India.

South Africa: Background

In US dollar terms, South Africa's exports fell by between 19 per cent and 35 per cent compared with the previous year in every month between November 2008 and April 2009 (the last month of data covered by the study). The beginning of the crisis also saw a substantial devaluation of the

rand (-24 per cent against the US dollar between August 2008 and January 2009), which has partially reversed since February 2009.

According to data from the South African Reserve Bank, the impact of the crisis was not just in terms of lower world market prices, but the quantity of exports also decreased across all sectors. The impact was strongest for mining. Agriculture was affected the least, while in manufacturing, strong increases in late 2007 and early 2008 were reversed in the first quarter of 2009.

South Africa's imports also contracted notably. While the decline began less abruptly than for exports, it reached -45 per cent in April 2009 (compared with April 2008).

According to Reserve Bank data, South Africa experienced contraction in real GDP in the last quarter of 2008 (-1.8 per cent annualized) and the first two quarters of 2009 (-6.4 per cent and -3.0 per cent annualized). The contraction in the first quarter of 2009 was in all three broad sectors (primary, secondary, tertiary) of the economy. Within the primary sector, Agriculture contracted moderately (-2.9 per cent) in the first quarter but then plummeted in the second quarter (-17.1 per cent) of 2009, following a bad harvest in most summer crops, after strong growth in 2008. Mining contracted by a massive -32.8 per cent in the first quarter of 2009 but recovered slightly in the second quarter (+5.5 per cent), following an already bad performance in 2008 (-6.5 per cent over the year, with a strong drop in the first quarter of 2008). Manufacturing also declined significantly (Q1 2009: -22.1 per cent; Q2 2009: -10.9 per cent) and seems to have been hit by the crisis earlier than the rest of the economy (-21.8 per cent in the last quarter of 2008). The tertiary sector was affected the least (Q1 2009: -0.8 per cent; Q2 2009: -1.2 per cent) after relatively slow growth in 2008 (+3.5 per cent in 2008).

The latest available data on employment from the Quarterly Labour Force Survey (third quarter of 2009) shows a negative development across most sectors. In total, 770,000 jobs were lost between the third quarter of 2008 and the third quarter of 2009. The largest job losses were in trade (-324,000), manufacturing (-194,000), agriculture (-114,000) and employment in private households (-108,000). The only sectors that

reportedly gained employment were finance (+50,000) and community and social services (+24,000). The unemployment rate over the same period rose from 23.2 per cent to 24.5 per cent. (Verick, 2010) argues that the main effect of job losses was to discourage workers from seeking a job and that, therefore, the crisis mainly manifested itself in terms of a decline in labour force participation. He finds discouragement to be strongest among those with low education, and finds that discouraged workers typically reverted to income support from household members and sometimes engaged in activities such as household work or helping on a plot of land owned by the household.

Box 3.2

Policy responses to the crisis in South Africa and India

In response to the crisis, the South African Government in February 2009 announced a stimulus package strongly focused on employment. The package had four elements:

- heavy investment (roughly US $60 billion) in public infrastructure over three years, with a focus on power generation and transportation;
- an extension of public employment, including the recruitment of 20,000 additional police officers by 2010;
- an increase in social transfers, including an increase in the age limit for child support to 18 years, a reduction in the pension age, an increase in school meals and additional resources for the fight against HIV/AIDS; and
- active labour market policies to mitigate job shedding in the private sector; for example, through extended holiday and training periods.

The Government of India announced a number of subsequent stimulus measures. These included:

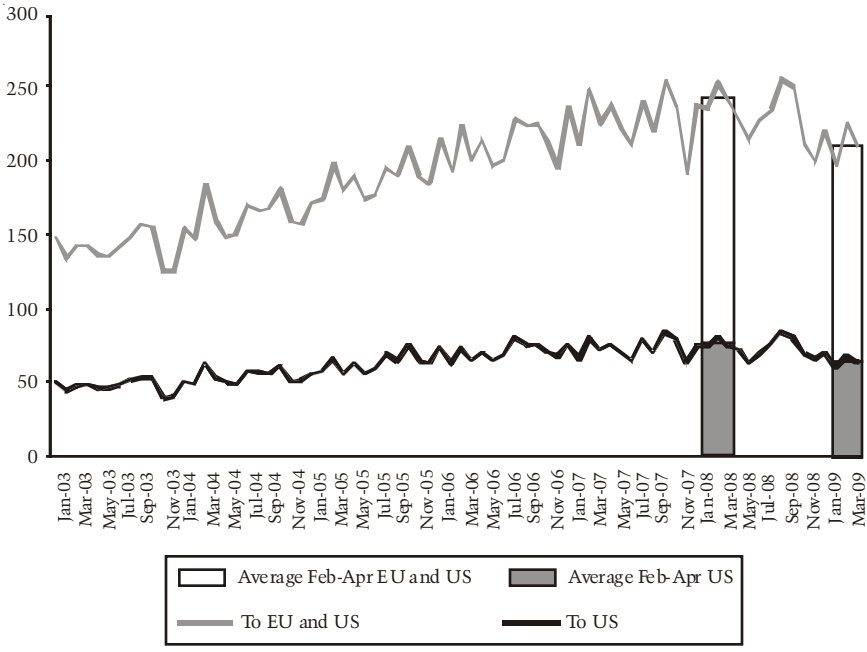
- a capital injection, purchase of foul assets and guarantees to stabilize the banking sector;
- a reduction in excise duties on cars and subsidized loans for automobile purchases;
- investment in infrastructure, mainly roads, ports and power generation, as well as the construction of 350 new food-processing units;
- an extension of the Software Technology of India Parks scheme, which was supposed to end in 2009, by one year to support the IT industry;
- a reduction on various taxes, aimed mainly at export industries;
- a government subsidy for trade credit for the textiles, handicrafts, carpets, leather, jewellery and marine products sectors; and
- the foundation of sector-specific tripartite committees as forums for social dialogue on crisis mitigation.

Description of trade data as used for the model simulation

Given that export data at the necessary frequency and level of detail was not available for India, mirror data (imports from India reported by the European Union and the United States) on the volume of India's exports was used for the modelling exercise. The data cleaning and preparation procedure is described in Annex 3. The resulting data on exports at constant prices is presented in Figure 3.14. Exports to the European Union and United States declined by 11.4 per cent between February-April 2008 and February-April 2009, mainly driven by a contraction of exports to the United States (-17.4 per cent; EU: -6.1 per cent).

Figure 3.14

India: Exports to European Union and United States at constant 2003 prices, 2003-09 (billion rupees)



Source: Kucera *et al.* (2010), based on data from USITC and Eurostat.

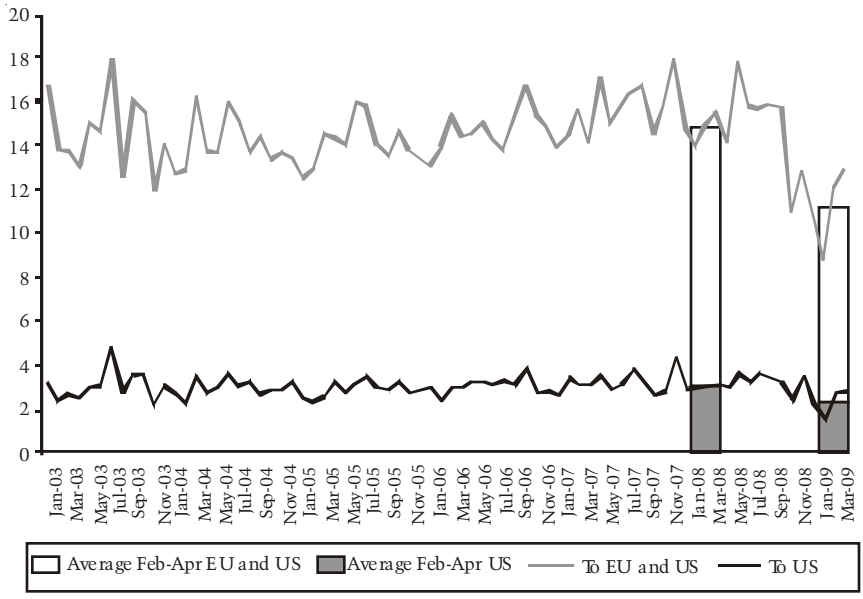
Annex 4 shows a detailed breakdown of the trade shock by sector as well as the estimated employment effects. In terms of absolute change, the strongest contraction is for the miscellaneous manufacturing sector, which

includes jewellery and gemstones (-30.6 per cent). In relative terms, the strongest contraction is for iron ore, other minerals (-53.6 per cent), followed by jute, hemp, mesta textiles (-42.7 per cent), and food (-32.8 per cent).[22] Surprisingly, exports in rail equipment, other transport equipment, which includes cars, increased by 12 per cent. This was driven by a strong expansion of exports to the European Union in the first months of 2009, which more than compensated for a contraction in the US market, and can to some extent be explained by the fact that as part of their stimulus packages, several European governments introduced a premium that encouraged consumers to scrap their old car and buy a new one, which led to a boom in small car sales in Europe.[23]

Figure 3.15 shows the results for the export shock for South Africa, based on the same data source and cleaning and preparation procedure as the India data. Exports to the European Union and the United States declined by 24.1 per cent, distributed rather evenly between the United States (-20.6 per cent) and the European Union (-25.6 per cent).

Figure 3.15

South Africa: Exports to the European Union and the United States at constant 2000 prices, 2003-09 (billion rand)



Source: Kucera *et al.* (2010), based on data from USITC and Eurostat.

The sectoral breakdown is reported in Annex 5. The strongest absolute changes are in iron and steel, non-ferrous metals (-40.2 per cent), other manufacturing (-38.8 per cent) and machinery (-36.5 per cent). In relative terms, non-metal minerals (-58.0 per cent) contracts the most, but from a very small base. Furniture (-41.3 per cent) also contracts considerably. Rather surprising is the increase (+20.0 per cent) of food exports. This was mainly driven by a substantial export transaction of sugarcane to the United States in April 2009.

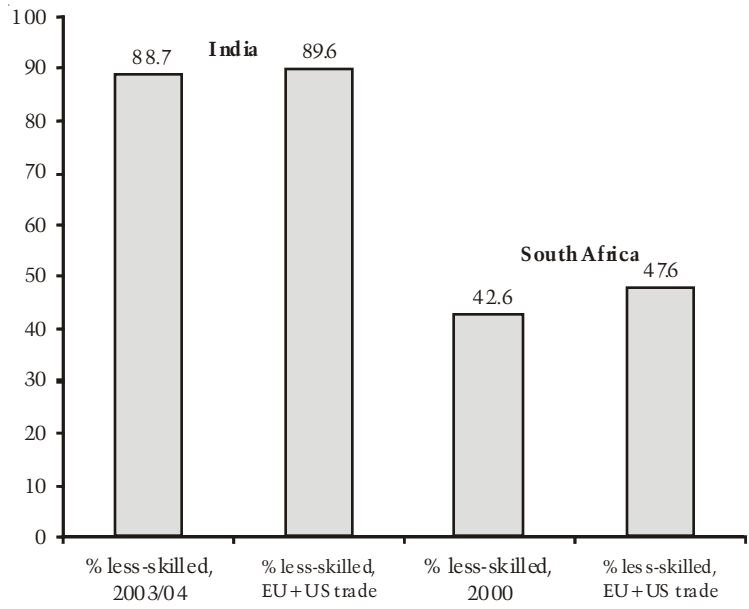
Estimation results

Under these scenarios, total job losses are estimated to amount to almost 4 million (or 1.1 per cent of the workforce) in India and close to 900,000 (7.2 per cent) in South Africa (Kucera *et al.*, 2010). These job losses are estimated full-time equivalents; in other words, they reflect the availability of paid full-time jobs. In reality, they are likely to manifest themselves as a combination of job and work-time losses as well as loss of income. The models estimate the combined effect of the direct trade shock, indirect effects through input-output connections between the sectors (the combination of these two effects is referred to as "Type I" effects) as well as income-induced effects; for example, reductions in consumer spending when household income declines. Of the total 4 million estimated job losses in India, only 1.9 million are caused by Type I effects and the remainder by income-induced effects (Kucera *et al.*, 2010). In South Africa, 510,000 jobs are lost through Type I effects and another 390,000 through income-induced effects (Kucera *et al.*, 2010). This implies that the employment effects caused by income losses in trading or trade-related sectors represent around half of the total employment losses in the two countries. These magnitudes are significant and they indicate that stabilizing household revenue can be an effective way to avoid crisis transmission.

In terms of the impact of the trade shock on different types of labour (Figure 3.16), the estimation results suggest that employment contractions in South Africa are characterized by a slight bias against less-skilled workers in the sense that they are overrepresented among those losing their job. For India, the results do not show a significant bias.

Figure 3.16

South Africa and India: Skill bias in employment effects of trade shock (percentages)



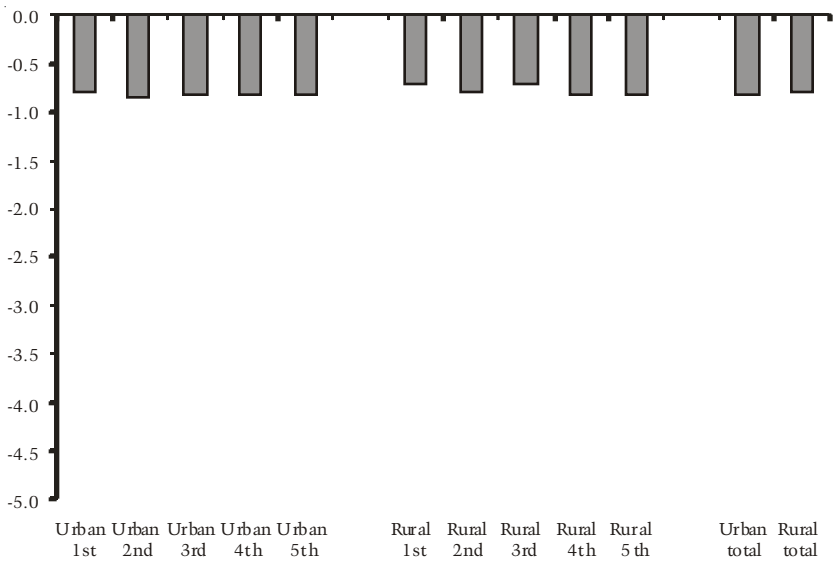
Source: Simulation results from Kucera *et al.* (2010).

Figures 3.17 and 3.18 show the results for the estimated impact of the trade shock on household incomes. For India, the effects of the shock are quite even between rural and urban households, and also between different income quintile households. Income losses are generally between 0.7 per cent and 0.8 per cent (Kucera *et al.*, 2010).

For South Africa, the income losses are much larger, and are also more diverse between different groups of households. Rural households (-4.7 per cent) lose slightly more than urban households (-4.3 per cent), and the share of income lost tends to increase for households with a higher income. The differences are more marked for rural households, where losses range from -3 per cent for the lowest household income quintile to -4.7 per cent for the highest income quintile (Kucera *et al.*, 2010).

Figure 3.17

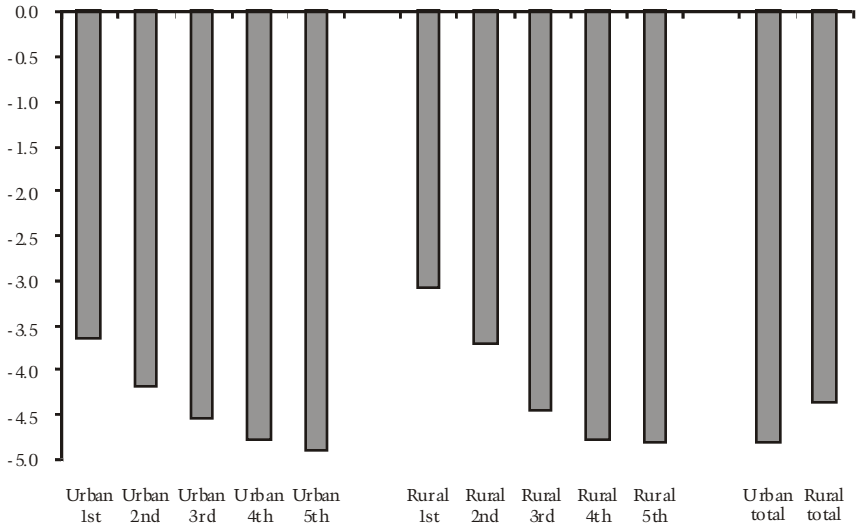
India: Impact of trade shock on household income (percentages)



Source: Simulation results from Kucera *et al.* (2010).

Figure 3.18

South Africa: Impact of trade shock on household income (percentages)

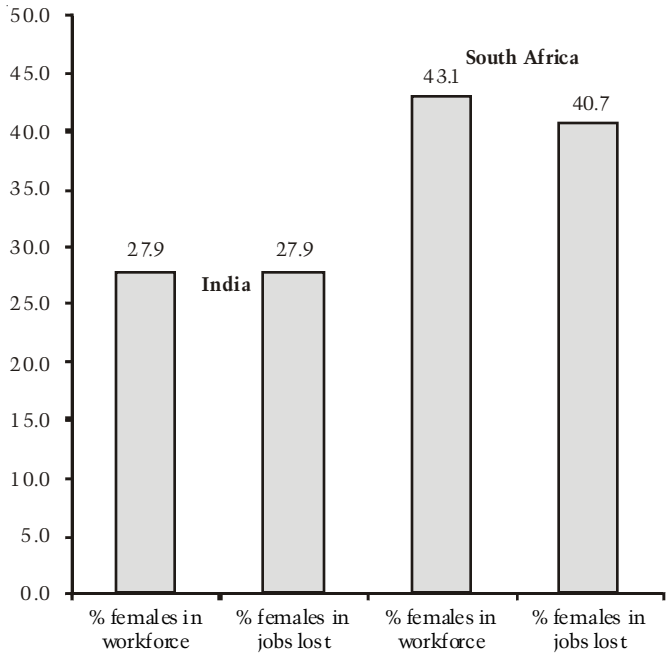


Source: Simulation results from Kucera *et al.* (2010).

Figure 3.19 shows the results for gender bias of job losses for South Africa and India. It shows the share of females in the total workforce *versus* the share of females in the predicted job losses. In India, there does not appear to be a gender bias in either direction, indicating that male and female workers have been affected more or less equally by the trade shock. In South Africa, women are slightly underrepresented among those losing their job, indicating that men were at a higher risk of losing their job due to the crisis.

Figure 3.19

South Africa and India: Gender bias in employment effects of trade shock (percentages)



Source: Simulation results from Kucera *et al.* (2010).

In terms of sectors, the largest absolute losses in both countries are in agriculture (India: -2.2 million jobs or 1.1 per cent of the workforce in this sector; South Africa: -240,000 jobs or 11.6 per cent of the workforce). For agriculture, roughly 0.8 million job losses in India and more than 145,000 in South Africa are caused by income-induced effects. In South Africa, the

employment losses in agriculture is quite surprising given that agricultural exports actually increased, but this is more than offset by declines through indirect and income-induced effects. It should be noted that the employment results from the model are estimated as changes in the full-time equivalents of paid labour demand. These can manifest themselves not only as actual job losses, but also as a reduction of working time or income losses. The latter is probably particularly relevant for agriculture, with its high prevalence of self-employment—a peasant who suffers temporary income losses is unlikely to give up his land and stop working, yet the decline in (paid) demand for his labour is real.

For India, only two of 37 industries are estimated to gain employment (Kucera *et al.*, 2010): fishing (+1.4 per cent) and rail equipment and other transport equipment (+0.4 per cent). Both are small in terms of absolute employment, and actually experienced an export expansion during the crisis. In relative terms, the industries with the largest estimated employment declines in India are miscelleneous manufacturing (-7.8 per cent), Jute, hemp and mesta textiles (-4.3 per cent), iron and steel and non-ferrous basic metals (-3.9 per cent), non-electrical machinery(-3.2 per cent), Furniture and wood products (-3.2 per cent) and metal products (-3.1 per cent). Compared with data for India reported in Table 3.4, the predicted job losses in the textiles and metal products sectors are relatively accurate, and the strong employment losses for jewellery and gemstones would explain a high share of the predicted loss in the SAM sector miscelleneous manufacturing, into which these products are mapped. A strong discrepancy is found for cars, which map into the rail equipment, other transport equipment sector. Here, the model predicted slight increases in employment, given the strong export performance, but survey data reported in Table 3.4 show significant employment losses. Given that the Indian car industry produces mainly for the domestic market, the most likely explanation seems to be that the increases in exports were more than offset by declines in sales in the domestic market.

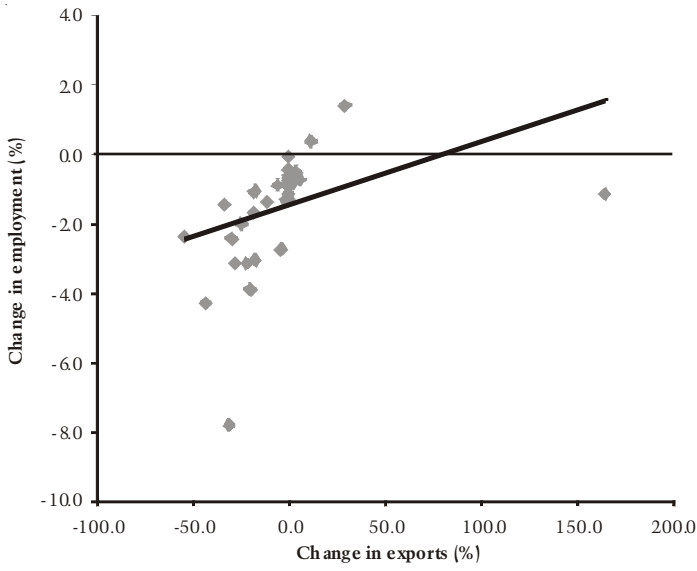
For South Africa, only construction had estimated employment gains (+0.6 per cent). In relative terms, the industries with the largest estimated employment declines are wood products (-141.5 per cent of 2000 employment), glass products (-60.9 per cent), printing and publishing (-35.5 per cent) and metal products (-29.6 per cent). The total predicted job losses

of 886,000 are very close to the empirical finding of 770,000 jobs lost between the third quarters of 2009 and 2008. In accordance with the empirical data, the model predicts significant job losses in trade services, hotels and catering and agriculture, as well as in several manufacturing sectors. However, the observed job losses in construction were not predicted by the model.

Figures 3.20 and 3.21 show the correlation between the percentage change in exports in a sector and the percentage change in employment. Bearing in mind that the employment changes are simulation results based on the export shock, it is quite remarkable how strongly some of the sectors deviate from a direct linear relationship. While the results for India show at least some correlation between the export shock and the employment shock, this does not seem to be the case for South Africa. Some sectors are affected strongly in terms of employment, even though their exports actually increased. This demonstrates the importance of indirect and income-induced effects and the need to take them into account in policy design.

Figure 3.20

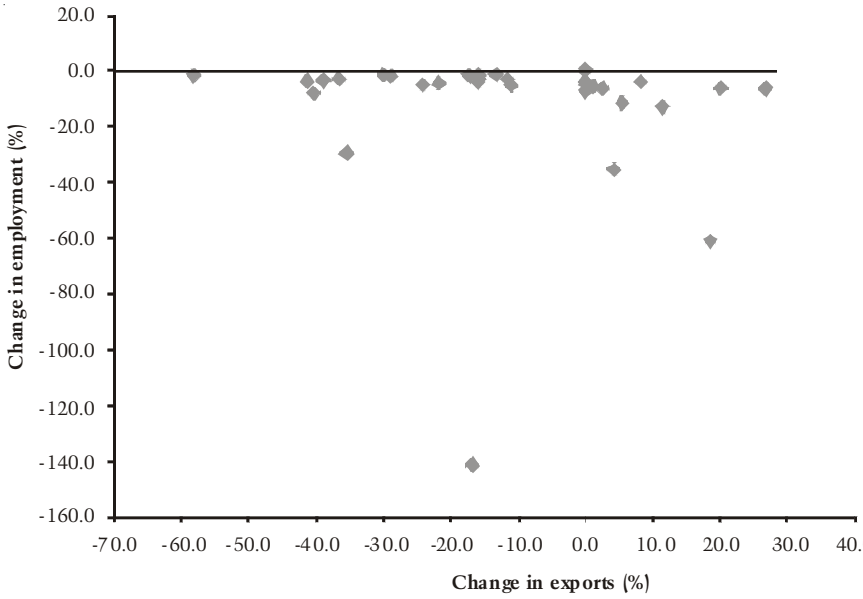
India: Correlation between trade and employment shocks



Source: Simulation results from Kucera *et al.* (2010).

Figure 3.21

South Africa: Correlation between trade and employment shocks



Source: Simulation results from Kucera *et al.* (2010).

Conclusions

The modelling results for South Africa and India, as well as some of the other case studies, have highlighted the importance of understanding the effect of the crisis at the household level rather than just focusing on the sectors hit directly by the trade shock. Through secondary and income-induced effects, a trade shock—even if temporary—can quickly spread and affect workers in other sectors of the economy, including the non-tradable sector. Policy measures targeting incomes of those active in exporting sectors and in companies supplying those sectors are, therefore, likely to be effective for stopping transmission. Subsidizing exporters to do "business as usual" would have similar effects, but it would create distortions in final markets because of the excess supply created. Measures targeting workers do not have the same negative side effects.

Another conclusion from the analysis provided in this section is that general equilibrium approaches should be used to evaluate crisis effects whenever data and available expertise allow for such approaches. Partial equilibrium analysis focusing on sectors directly affected by a shock only gives a partial picture. The employment effects estimated for India and South Africa are remarkably close to those observed, indicating that relatively user-friendly Leontief multiplier models applied here may represent a useful tool for crisis analysis.

3.5 Brazil: Distributional effects of trade during the crisis[24]

Distributional effect of a trade shock

Traditional trade models based on the Heckscher-Ohlin model predict that a country will specialize in sectors that intensively use the production factors abundant in that country. Accordingly, labour-abundant developing and emerging economies are expected to export labour-intensive goods, in particular those that require intensive use of low-skilled labour.[25] If the economy is hit by a negative trade shock, low-skilled labour would be expected to suffer. Other production factors that are likely to be hit hard by a trade shock are those that are specific to the exporting sectors; that is, those that cannot easily be reemployed for other economic activities (Viner, 1931). Land is, for instance, considered specific to agricultural activities and land prices would suffer from negative shocks to agricultural trade. Capital in the form of machinery can also be sector specific. Negative trade shocks are expected to lead to significant levels of obsolescence or revenue losses among sector-specific factors. The methodology used in the Brazil study discussed here allows for the analysis of adjustment mechanisms in factor markets and the evaluation of distributional effects of trade shocks.

Brazil: Who gets hit by the trade shock?

Methodology

The Brazil study uses the STAGE_LAB computable general equilibrium (CGE) model. The model allows for the analysis of labour market and income effects in detail, including a breakdown of results by income level and region. It includes a number of innovations, including the ability to model endogeneously determined unemployment for all labour types and

the migration of labour between different segments of the labour market. This class of model usually considers trade flows to be endogeneous variables that are determined by exogeneous policy variables. For this study the model has been configured to simulate the effect of an exogeneous trade shock on the variables of interest. Annex 6 presents a technical description of the model.

The model is similar to a version used in a previous study which analyzed the gains from trade in Brazil and the potential impact of a number of future scenarios for trade policy (Polaski *et al.*, 2009). That study found relatively small overall gains from trade, but significant reallocation of resources as a result of trade liberalization.

For this study, the model was configured to accommodate the short-term nature of the trade shock. Two main adjustments were made. First, as with South Africa and India, it is assumed that the strong decline in imports during the crisis reflects a drop in demand rather than the replacement of imports with domestic production and therefore cannot be expected to lead to employment and income creation in Brazil. Therefore, the trade shock is defined only on the basis of observed changes in exports. Import quantity is kept endogeneous and can adjust in response to the export shock under the assumption that the world market price for imports does not change.

Second, capital use by each sector is fixed and the economy adjusts through the reallocation of labour. This is a classic short-term response, where sectors do not reallocate capital if a shock is reasonably expected to be temporary.

As for South Africa and India, detailed monthly data on Brazil's export values and quantities at the product level is not available and thus mirror data was used on imports from Brazil reported by the United States and the European Union. Together, they accounted for 41 per cent of Brazil's total exports in 2007.[26] Data for the months February-April 2009 was compared with February-April 2008 figures, and the calculated percentage changes were applied to the trade vector in the model. The procedure for preparing and cleaning the data was the same as reported for South Africa and India in Annex 3, except for the base time period for the constant prices, which for Brazil was 2007 in accordance with the base year of the SAM.

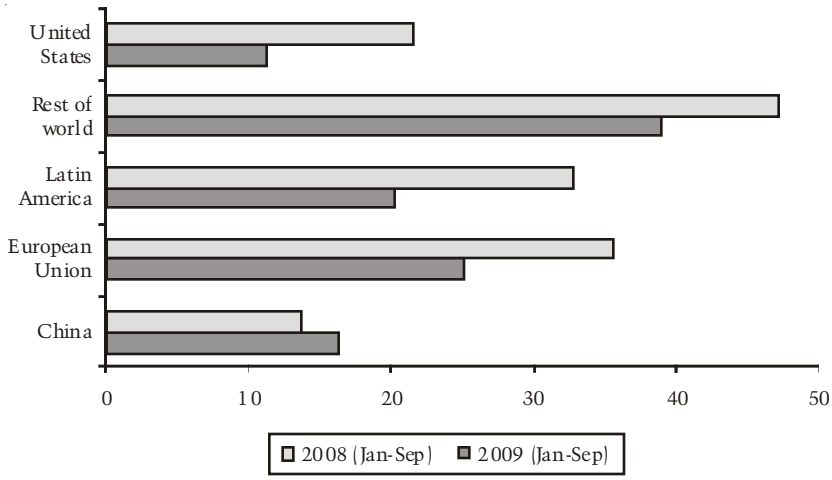
Background: Brazil during the crisis

After strong growth performance in 2008, exceeding 5 per cent, Brazil's GDP dropped by approximately 0.7 per cent in 2009. The value of Brazil's imports and exports declined substantially in the last quarter of 2008 and the first quarter of 2009. Since then, they have recovered slightly. In the first quarter of 2009, exports were 19 per cent and imports 22 per cent below their value in the same quarter of 2008. It is important to note that these are value changes, which to some extent were driven by changes in world market prices.

Data from Banco Central do Brasil suggests that the decline in exports was stronger for manufactured products than for primary and semi-manufactured products, but all product categories experienced a decline. Geographically, the strongest decline was in exports to the United States and Latin America, followed by the European Union and the rest of the world. Exports to China continued to grow (Figure 3.22).

Figure 3.22

Brazil: Impact of the crisis on exports by destination (US$ billion)

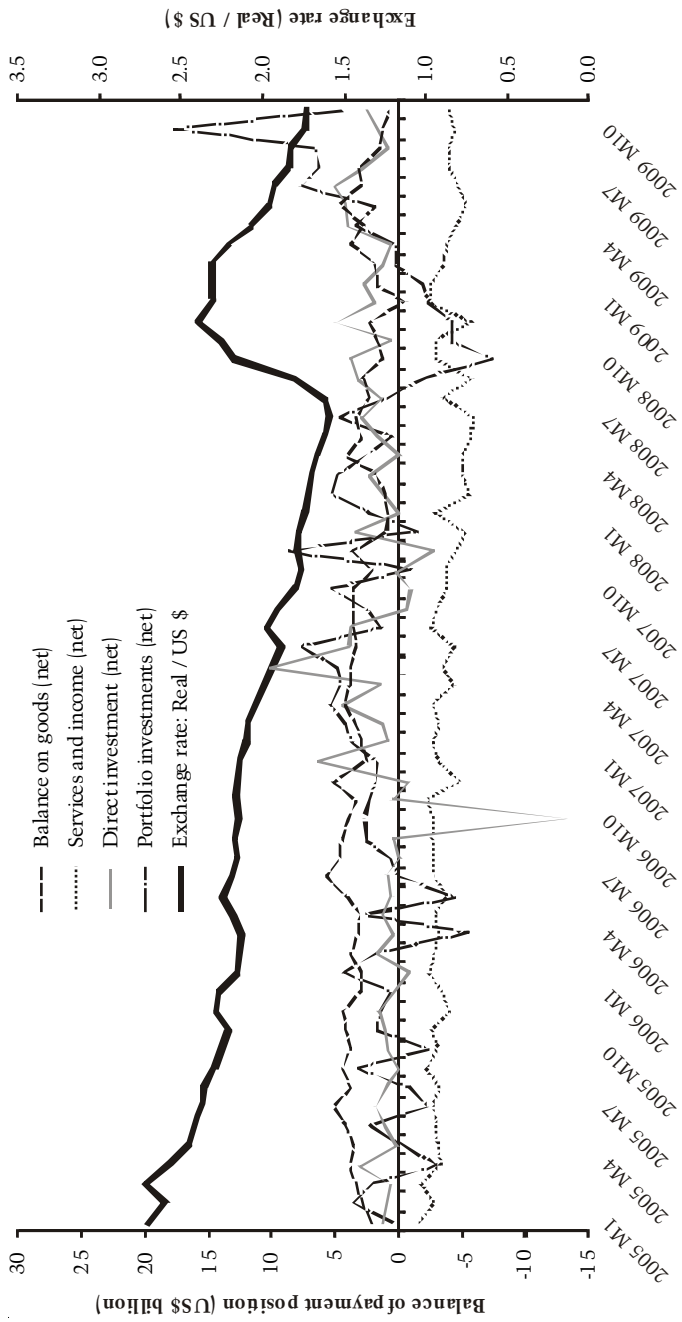


Source: McDonald *et al.* (2010), based on data from Banco Central do Brasil.

As Figure 3.23 shows, the real depreciated steeply at the beginning of the economic crisis. Between August and December 2008, the exchange

Figure 3.23

Brazil: Balance of payment and exchange rate fluctuations, 2005-09



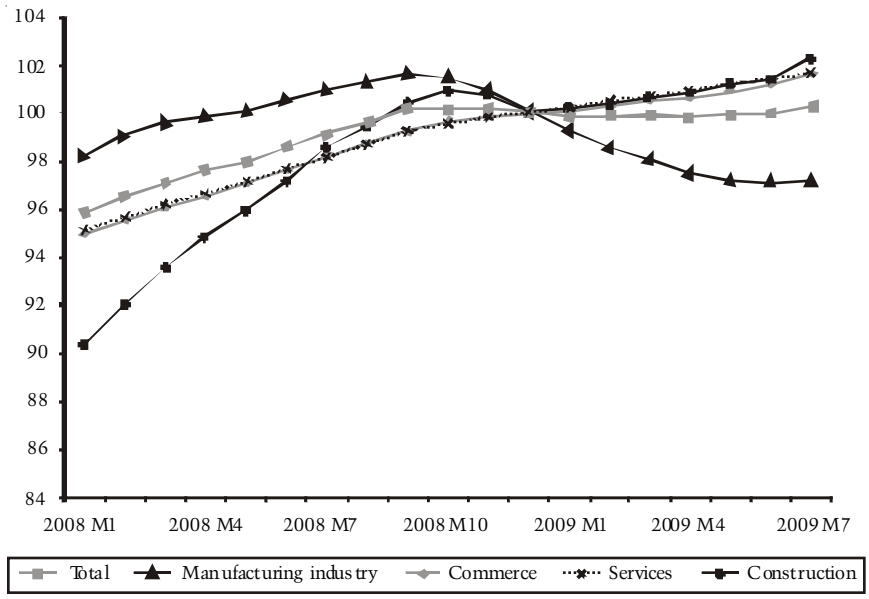
Source: McDonald *et al.* (2010), based on data from Banco Central do Brasil.

rate went from 1.6 to 2.4 real per US dollar. It has subsequently recovered and was close to its pre-crisis level at the end of 2009. Figure 3.23 also illustrates the balance of payment dynamics that caused this fluctuation. While the trade balance, both for goods and for services, and the balance for direct investment remained fairly stable throughout the crisis, the fluctuation in the exchange rate seems to have been driven by a rapid outflow of portfolio investment. This outflow has since reversed, with strong inflows from the second quarter of 2009 onwards.

Figure 3.24 shows the available data on the impact of the crisis on employment by sector of the economy. Total employment dropped slightly in the first quarter of 2009, but the data for July shows a modest recovery. The decline in employment was caused mainly by a sharp drop in manufacturing. Construction employment also declined slightly at the beginning of the crisis, but it picked up again quickly. Employment in services and commerce was not strongly affected and continued to grow.

Figure 3.24

Brazil: Employment index by sector, 2008-09 (2008 M12 = 1000)



Source: McDonald *et al.* (2010), based on data from Ministry of Labour and Employment of Brazil.

The average unemployment rate increased from 6.8 per cent in December 2008 to 9.0 per cent in March 2009, but quickly fell again to 7.7 per cent in November 2009. It is interesting to note that the impact of the crisis on unemployment was considerably stronger in the industrial region of Sao Paulo, where unemployed exceeded 10 per cent in some months, while unemployment in the region of Rio de Janeiro remained fairly stable, at around 6 per cent, during the crisis. According to data from the Banco Central do Brasil, average earnings in real terms remained stable, and even saw an increase in early 2009 when the Government raised the minimum wage. This holds true for both registered and unregistered employment, although for registered employment there seems to be a pattern where a part of the increase in early 2009 was reversed in the following months.

Box 3.3

Policy responses to the crisis in Brazil

In terms of monetary policy, Brazil responded to the crisis by cutting interest rates and reducing reserve requirements to increase liquidity in the banking system. The banking sector was stabilized through a capital injection, the purchase of foul assets and the provision of government guarantees. Fiscal stimulus measures included:

- an extension of the *Bolsa Familia* (family allowance) conditional cash transfer programme to cover an additional 1.3 million households over the previous 11.1 million;
- extension of unemployment benefits by two months for workers in the most affected industries who lost their job after November 2008, and a 12 per cent increase in the minimum wage;
- a vow by the Government to maintain and expand a previously adopted US $213 billion investment programme focused on social infrastructure, transport and energy;
- US $6.5 billion for the agriculture sector, to be spent through a number of different mechanisms;
- tax breaks for car manufacturers, on the condition that they do not lay off workers;
- a reduction in taxes on construction; and
- a reduction in import tariffs for a number of capital goods.

Source: ILO (2010b). Sectoral Activities Department.

Trade data description

Table 3.5 presents the detailed data for the trade shock as used for the modelling exercise and described in the methodology section. The first

Table 3.5

Brazil: Trade shock as used in the model

		Export volume change: EU & US (%)	*Export volume change: world (%)*
cCana	Sugar cane	0.0	0.0
cSoya	Soybean	31.2	12.8
cOagr	Other agriculture	-21.5	-14.2
cLstoc	Livestock	-13.6	-4.3
cMinex	Mineral extraction	-57.8	-18.3
CPGex	Petrol and gas extraction	39.0	21.9
cNmetex	Non-metallic minerals	-32.8	-19.1
cIron	Iron	-62.6	-30.5
cNfer	Non-ferrous metals	-56.9	-26.9
cOmet	Other metal products	-39.0	-13.1
cMach	Machinery	-45.0	-16.5
cEmat	Electric materials	-22.5	-6.9
cEquip	Electronic equipment	-22.5	-6.9
cAuto	Automobiles	-14.5	-2.5
cOveh	Other vehicles and spare parts	-48.0	-17.8
cFurn	Wood and furniture	-29.9	-20.6
cPap	Paper and graphic	20.2	5.9
cRub	Rubber products	-23.6	-8.6
cChem	Chemical elements	-12.2	-5.0
cPetro	Refined petrol products	-17.3	-2.4
cOchem	Other chemical products	6.8	1.1
cPharm	Pharmaceuticals	66.7	15.7
cPlas	Plastics	-7.7	-2.0
cText	Textiles	-35.9	-12.0
cApp	Apparel	-26.9	-17.2
cLeath	Leather products	-26.9	-13.1
cCoff	Processed coffee products	-24.7	-21.0
cLprod	Livestock products	-8.2	-2.4
cSug	Sugar	-25.6	-1.3
cOfd	Other food products	-2.0	-1.1
cOman	Other manufacturing	-10.8	-6.7
	Total	-23.0	-9.4

Source: McDonald *et al.* (2010), based on data from USITC, Eurostat and COMTRADE.

column of values presents the percentage change in export volumes with the European Union and the United States. Simply applying these percentage changes to Brazil's total exports would probably lead to an overestimation of the trade shock as Figure 3.25 suggests that, at least in value terms, the contraction in exports to the European Union and the United States was stronger than the contraction in exports to the rest of the world. Thus, the final column shows a hypothetical export shock with all trading partners if it is assumed that exports to the rest of the world remain unchanged (it is thus a function of the previous column and the shares of European Union, United States and rest of the world in total exports for each sector). This very conservative estimate of the export shock was used for the simulations.

Exports declined for 26 out of 31 sectors. The strongest declines in exports to the European Union and the United States were in the iron (-62 per cent), mineral extraction (-58 per cent) and non-ferrous metals (-57 per cent) sectors. Vehicles other than automobiles (-48 per cent), machinery (-45 per cent) and other metal products (-39 per cent) also declined very strongly. The total volume of exports to the European Union and the United States declined by 23 per cent. Assuming that exports to the rest of the world remained unchanged, this would translate into a 9 per cent decline in total exports. Along with the previously mentioned sectors, wood and furniture (-21 per cent) and processed coffee products (-21 per cent) appear among the most affected sectors, given their high share of exports to the European Union and the United States.

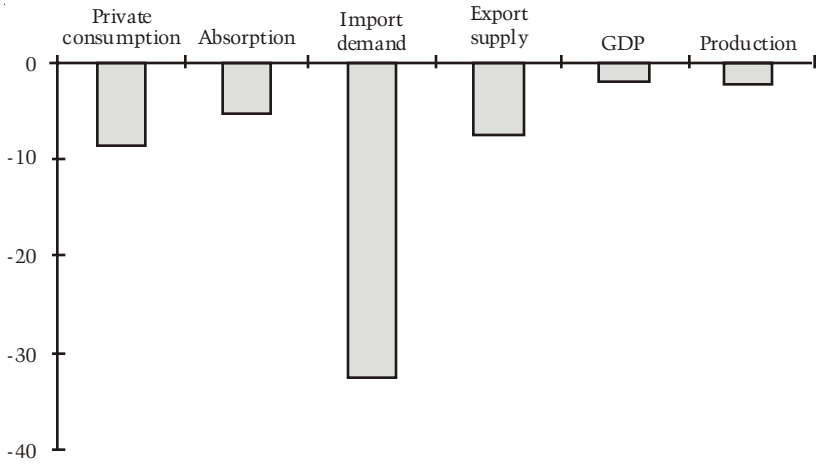
Estimation results

Aggregate-level impacts of the trade shocks are summarized (in real terms) in Figure 3.25. These reflect an estimated small but appreciable reduction in GDP (2.1 per cent) and reduction in domestic production, absorption and private consumption (8.7 per cent) (McDonald *et al.*, 2010).[27]

There is a notable tendency for the reduction in welfare, expressed in consumption expenditure, to be greater in the relatively richer—more developed—regions of Brazil. The magnitudes of the impacts on per capita welfare are illustrated in Figure 3.26 for different regions. The figures reflect how the trade shock affects regions differently, with Sao Paolo suffering a significantly larger loss than other regions. Losses are also

Figure 3.25

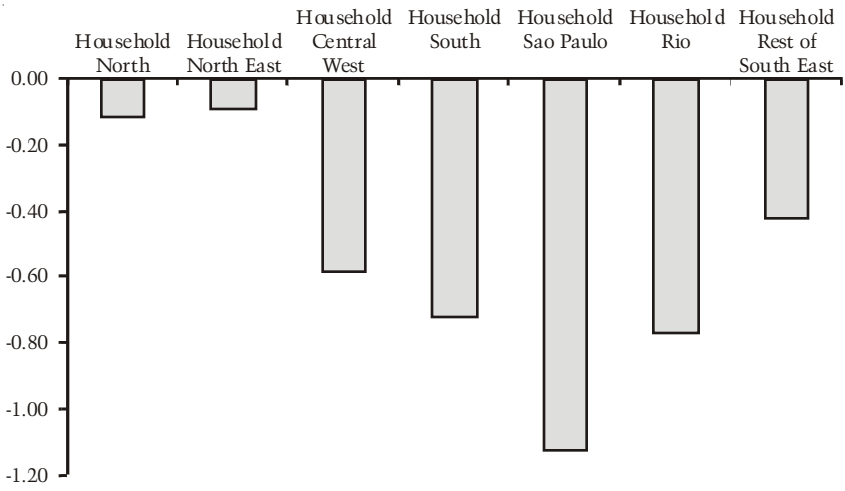
Brazil: Changes in real macroeconomic aggregates (percentages)



Source: Simulation results from McDonald *et al.* (2010).

Figure 3.26

Brazil: Real welfare per capita (equivalent variation, in 2000 real)



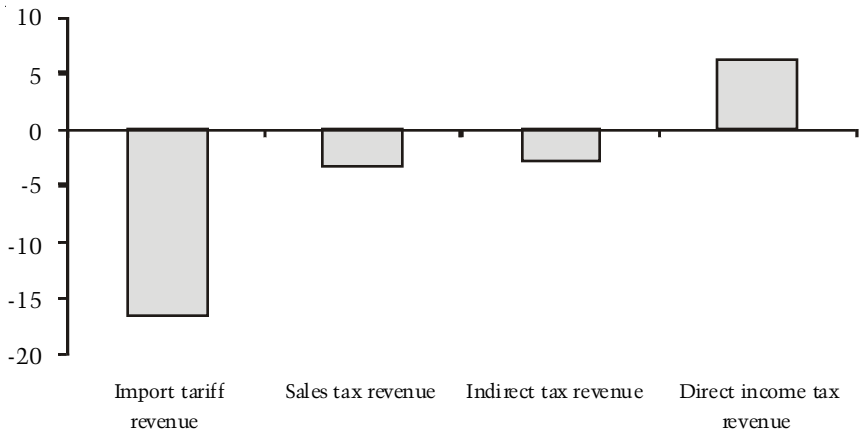
Source: Simulation results from McDonald *et al.* (2010).

significant in Rio and in households in the Central West, South and South-East regions. The North and North-East regions only experience small reductions in absolute per capita welfare levels.

The model used also allows for an evaluation of the impact of the crisis on government revenue, which is of interest in the context of the ongoing debate on government deficits triggered by the crisis. The model assumes that the Government collects revenue through import tariffs, sales taxes, indirect taxes and direct income taxes. The model is set up in such a way that revenue from import tariffs, sales taxes and indirect taxes automatically adjusts with changes in the aggregates that are taxed. The direct income tax rates, however, will be changed by the Government in order to achieve a balanced budget. Figure 3.27, showing changes in tax revenue, therefore indicates that the Government would need to raise an additional 5 per cent of revenue in direct income taxes in order to balance the losses from other revenue sources triggered by the trade shock (McDonald *et al.*, 2010). The figure of 5 per cent is only valid for the pure export shock simulated in this model and under the particular assumptions used in the model. It is nevertheless striking that the trade shock alone

Figure 3.27

Brazil: Changes in tax revenue (percentages)



Source: Simulation results from McDonald *et al.* (2010).

would trigger the need for a significant 5 per cent increase in tax revenue to keep the government budget balanced. This indicates that even in the case of a country such as Brazil, which has been hit relatively mildly by the crisis, the effect on the government budget can be significant, even when the need to support the financial system has been assumed away.

The main driving forces behind the changes in household consumption and welfare reported above are the induced changes in the factor markets and the consequent implications for factor incomes that are passed down to households to generate their incomes. The model assumes that land and capital are fixed and sector specific, while labour is mobile across sectors and regions. These assumptions therefore correspond to a specific-factor type of model, where capital and land are assumed not to adjust (in the short run). The trade shock hit Brazil through the manufacturing sector. If Brazil was exporting manufacturing products that require intensive use of low-skilled—that is, low-wage labour, we would expect low-skilled labour to be among the biggest losers from the shock, and we would expect this to be the case across sectors, because workers are mobile across sectors. This expectation is confirmed in our findings, as illustrated in Table 3.6.

Table 3.6

Brazil: Changes in factor incomes

(percentages)

	North	*North East*	*Central West*	*South*	*Sao Paulo*	*Rio*	*South East*
Very low wages	-11.15	-7.27	-1.60	-6.00	-7.43	-7.71	-8.80
Low wages	-9.24	-6.78	-2.13	-5.64	-6.48	-6.80	-7.99
Medium wages	-7.37	-6.09	-2.06	-5.94	-5.68	-5.96	-6.71
High wages	-2.85	-2.48	-0.95	-2.44	-2.56	-2.44	-2.86
Very high wages	-2.83	-2.19	-1.08	-2.36	-2.77	-1.41	-2.94
Capital	-4.64	-3.73	-5.26	-4.75	-5.10	-2.39	-5.16
Land	-9.51	-5.48	6.37	-1.01	-3.37	-8.69	-6.97

Source: Simulation results from McDonald *et al.* (2010).

The incomes of different types of labour decline, in particular for the very-low-wage and low-wage labour types. The same patterns emerge for capital, with declines in all regions. It is, however, notable that returns to

land increase in one region—Central West; this is because of increases in demand for agricultural products that are predominantly produced in the Central West region. Central West is also the only region where the lowest wage earners are not the biggest losers from the trade shock.

Given the set-up of our model, our simulations should also find significant losses in capital revenues in the sectors that experience strong declines in trade. The findings shown in Table 3.7 indeed reflect significant losses to capital in mineral extraction, iron and other vehicles, three sectors that experienced important declines in exports during the crisis.

In the model it is assumed that high-skilled labour is fully employed, but there is an oversupply of low- and medium-skilled labour that leads to unemployment. In this set-up, a trade shock will generate changes in unemployment among low- and medium-skilled workers and wage changes for high-skilled workers. Because the model allows for high-skilled labour to migrate across regions in response to wage difference, the simulations capture migration pressures triggered by the simulated trade shock. Figure 3.28 shows that the northern regions, the South-East and, to a lesser extent, Sao Paulo have become less attractive for high- and very-high-wage earners as a result of the shock. Top wages also suffer in Rio, but less so than elsewhere, and as a result high-skilled labour would be tempted to migrate towards Rio and also the Central West, the region that benefits from increases in demand for agricultural products.

Because of the assumptions used in this simulation, labour is the only production factor that can adjust to the trade shock. Under these assumptions, labour adjustments, in terms of migration or changes in unemployment, are larger than they would be if all production factors were allowed to adjust. The absolute values of the changes reported here should, therefore, not be taken at face value, but the relative changes tend not to vary under different assumptions to the model or to different scenarios for the shock.[28] As such, the simulation results presented here provide useful guidance as to the distribution of the losses caused by the negative trade shock across regions and production factors. The exercise also illustrates how decisions, such as migration decisions, which were also mentioned in the Uganda case study, can be modelled in order to generate aggregate and measurable economic effects of such decisions.

Table 3.7

Brazil: Factor payments by aggregate factors

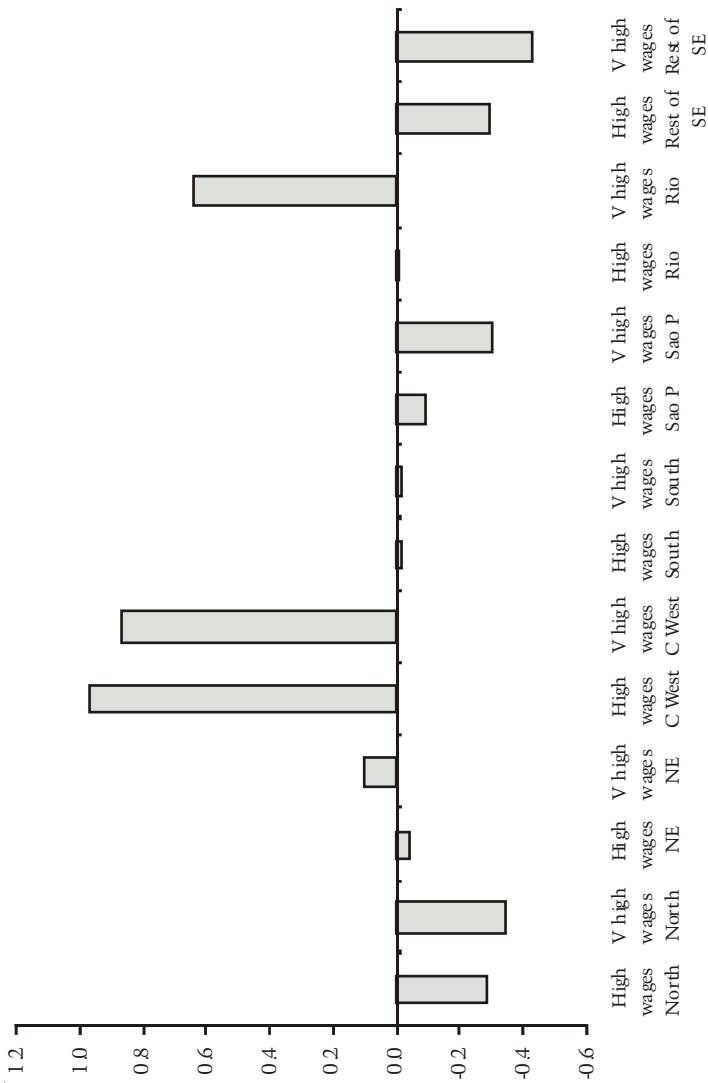
(percentage change)

	Labour		*Capital*	
	X Shock	*X&M Shock*	*X Shock*	*X&M Shock*
Mineral extraction	-1.88	-1.13	-5.38	-19.72
Petrol and gas extraction	-2.13	-1.18	32.76	25.24
Minerals	-1.46	-0.86	-1.60	-1.78
Iron	-1.82	-1.09	-8.25	-11.41
Non-metals ferrous metals	-1.82	-1.08	-4.47	-2.40
Metal products	-1.81	-1.06	3.84	2.77
Machinery	-1.99	-1.16	8.82	19.74
Electric materials	-1.94	-1.14	3.47	3.85
Electronic equipment	-1.95	-1.15	19.70	20.93
Automobiles	-2.15	1.27	-5.19	-1.37
Other vehicles	-2.13	-1.25	-5.98	-10.19
Wood and furniture	-1.28	-0.74	-12.61	-10.58
Paper	-1.89	-1.11	-3.66	0.00
Rubber products	-2.07	-1.21	-1.75	2.28
Chemicals	-1.78	-1.04	6.24	6.37
Petroleum products	-2.10	-1.17	4.10	10.26
Chemicals products	-1.92	-1.13	7.33	4.42
Pharmaceuticals	-1.96	-1.15	-1.32	-12.15
Plastics	-1.55	-0.91	2.79	5.53
Textiles	-1.35	-0.78	-4.77	-4.28
Apparel	-0.97	-0.56	-7.15	-4.23
Leather	-1.00	-0.57	-11.09	-8.07
Coffee products	-1.36	-0.80	-12.77	-8.81
Livestock products	-1.35	-0.78	-7.77	-4.46
Sugar	-1.36	-0.79	-3.89	-2.09
Other foods	-1.34	-0.76	-4.57	-2.53
Other manufacturing	-1.64	-0.96	-5.69	-4.04
Utilities	-1.90	-1.11	-6.45	-4.79
Construction	-1.19	-0.70	1.22	1.16
Trade	-1.58	-0.92	-4.42	-2.26
Transport	-1.90	-1.11	-3.50	-2.72
Communications	-1.90	-1.10	-8.05	-4.32
Financial services	-2.18	-1.27	-10.68	-5.97
Family services	-1.52	-0.88	-8.31	-4.69
Enterprise services	-1.89	-1.10	-2.89	-3.67
Dwellings	-1.61	-0.93	-9.86	-5.28
Public admin	-2.03	-1.18	-1.68	-1.23
Private services	-1.69	-0.98	-8.68	-4.82

Source: Simulation results from McDonald *et al.* (2010).

Figure 3.28

Brazil: Changes in employment due to labour migration (percentages)



Source: Simulation results from McDonald *et al.* (2010).

Conclusions

A number of the country studies have shown that the impact of the crisis, and more specifically the trade shock, can vary substantially between different households and production factors. This was shown more formally in this section for Brazil in the context of a CGE modelling framework. The simulations showed that, *ceteris paribus*, the trade shock experienced during the global economic crisis created significant pressure on employment and income in most regions, and affected low- and very-low-wage earners disproportionately.

In Brazil, the Government was quick to adopt policy measures to protect poor households in response to the crisis. A particular advantage for the Government was that it could rely on a number of mechanisms that were already in place before the crisis. The *Bolsa Familia* (family allowance) conditional cash transfer programme, which had proven to be effective in providing social protection to the poorest members of society, was extended. Similarly, existing labour market policy instruments, such as unemployment benefits, could be quickly scaled up to counteract the effects of the crisis. Major investments in social infrastructure that were already under way were scaled up when the crisis hit, and existing schemes for rural development received additional funding (see Box 3.3). It seems that these measures have arguably been quite effective at countering the negative pressures on the labour market, as unemployment quickly reversed from its increase at the onset of the crisis and wages remained stable, and even increased slightly in real terms, in 2009. The modelling results give a view of the full magnitude of the employment and income effect that may have hit Brazil in the absence of policy intervention. They thus justify the Government's quick and decisive intervention, as well as its focus on low-income households and protection of workers in some of the measures adopted.

3.6 Egypt: Gender impact of trade during the crisis

A gender perspective on trade and the impact of the crisis

Work on the impact of trade on gender typically focuses on the question of whether and how trade impacts on the inequality in wages and

employment opportunities for men and women. Consistent with the logic described in Section 3.5, women would be expected to take advantage from trade if countries start to export goods or services that intensively use female labour. Becker (1971) argues that women should be expected to gain from trade independently of the resulting export structure, because trade leads to more competition and thus urges firms to reduce their "cost of discrimination" by hiring more women. This, however, has been contradicted on various grounds; for instance, it has been argued that in a discriminatory environment, discrimination is not a cost for companies, but a conscious business decision (Albelda *et al.*, 2004). Empirically, Weichselbaumer and Winter-Ebmer (2005) conclude from a vast literature survey on the topic that, after controlling for improvements in females' education levels, the gender-wage gap has not narrowed over recent decades, a period characterized by strong increases in global trade. In a recent cross-country study that explicitly examines the effect of trade on the gender-wage gap, Oostendorp (2009) finds that while trade has had a narrowing impact on the gender-wage gap in rich countries, the evidence for poor countries is not conclusive.

The data presented in Chapter 2 (Section 2.3) suggests that at the global level, the employment impact of the recent global financial and economic crisis has not had a strong gender bias. This finding, however, hides large differences in the gender-specific employment effects at the national level. The level and nature of the gender bias depends, to a large extent, on which sectors are affected most by the crisis. Among the seven focus countries, different effects can be observed. In Ukraine, the basic metal and metal processing industry was hit particularly hard by the crisis. The industry employs a significant share of the country's working population, and employment in the sector is predominantly male. Consequently, the employment impact of the crisis in Ukraine was biased against male workers. For South Africa, the model estimates also predict that the crisis impact was slightly stronger for men, as women are underrepresented among workers predicted to lose their job when compared with their overall share in the workforce (40.7 per cent to 43.1 per cent). The employment impact on India is estimated to be gender neutral (see Section 3.4). Morocco is an exporter of textiles and clothing, a sector that is a heavy user of female labour. Women represent around 60 per cent of the workforce in

textiles and clothing in Morocco and their jobs are concentrated at the lower skill levels. A recent sector-specific study commissioned by the ILO revealed that job losses among women in the sector were higher than would be expected according to their proportion in the total sectoral employment (Bensaid and Ibourk, 2010). The authors explain that low-skilled labour is used as a buffer in times of crisis, with the result that women are overrepresented among the job losers, even though the sector is characterized by high female employment. All these stylized facts highlight the importance of a gender perspective in understanding the employment effects of the crisis. The remainder of this section applies this paradigm to the case of Egypt and analyzes in more depth the gender aspects of the impacts of the trade shock.

Box 3.4

Morocco: Policy responses to the crisis

A stimulus package of 1.3 billion dirhams was made available to three sectors identified as being particularly affected by the crisis: textiles and clothing, leather and the automobile industry. The package consists of five components:

- a social component: under which the Government takes full charge of employer contributions for companies that do not reduce their workforce by more than 5 per cent;
- a financial component: which aims to prevent companies from defaulting on running credits;
- a trade component: offering privileged access to export credit;
- an administrative component: which allows companies to sell locally a share of goods intended for export in the event of cancellation of contracts by importers; and
- a training component: providing finance for the upgrading of skills of workers already employed.

An evaluation of the uptake of the announced measures reveals that the social component has been the most popular and has been used by over 40 per cent of eligible enterprises. The training component has been used by around one-quarter of the eligible enterprises in the car industry, but there has been little uptake by companies in the textile sector. Fewer than 7 per cent of eligible enterprises have taken advantage of the trade component, probably reflecting the fact that the fall in Morocco's exports was mainly caused by a drop in demand in destination countries rather than a lack of access to export finance.

Source: Bensaid and Ibourk (2010).

Egypt in the global economic crisis

Background

The global crisis led to a fall in Egypt's GDP growth. GDP growth remained positive, but dropped from 7 per cent before the crisis to just over 4 per cent during the crisis. The crisis was transmitted to Egypt mainly through shrinking export income and decreasing remittances. Exports were severely hit by the downturn in the United States and the European Union. At the same time, large numbers of expatriate workers returned from abroad, in particular from the Gulf countries, leading to a fall in remittances. According to preliminary balance of payment statistics, net private transfers decreased from US $8.4 billion in 2007/08 to US $7.6 billion in 2008/09. It was estimated that more than 75,000 Egyptians returned from the Gulf countries between October 2008 and August 2009 (Center for Trade Union and Workers Services, 2009). This represents around 7.5 per cent of over 1 million Egyptians who were estimated to be living in Gulf region countries with temporary immigration status in 2008.[29]

Table 3.8

Egypt: Foreign direct investment flows, 2004-09

(US$ million)

	2004/05	*2005/06*	*2006/07*	*2007/08*	*2008/09*
Total net foreign direct investment	3 902	6 111	11 053	13 237	8 113
Inflows	4 135	9 098	13 084	17 802	12 836
United States	2 040	4 554	4 681	6 448	3 515
Europe	695	2 852	2 439	5 105	3 904
Arab countries	189	300	3 298	2 733	1 701
Other countries	1 209	1 392	2 666	3 516	3 716
Outflows	-233	-2 987	-2 031	-4 566	-4 723

Source: Klau (2010), based on data from CAPMAS.

Foreign direct investment (FDI) was also affected by the global crisis, as illustrated in Table 3.8. After several years of growth, inflows of FDI into the Egyptian economy dropped by nearly US $5 billion in 2008/09 compared with 2007/08. The major share of the decrease in FDI inflows was due to falling investment from the United States and European countries, whereas inflows from other source countries increased in

absolute terms to over US $3.7 billion. Regrettably, a sectoral analysis of FDI inflows is precluded by the lack of data. Anecdotal evidence points to the particular importance of FDI in the petroleum, clothing and textiles, and tourism sectors.

The trade shock and its employment effects

Trade data for the first five months of 2009 indicates that trade has been a major transmission channel of the crisis to Egypt: exports fell by over 25 per cent, while imports decreased by more than 17 per cent. A positive side effect of the downturn was that it also dampened import demand, helping to bring down the trade deficit. With the exception of raw materials, all product groups experienced a strong decline in exports between the beginning of 2008 and the beginning of 2009. Among non-petroleum products, the decrease was particularly strong for finished goods (-26.6 per cent), which include the employment-intensive textile and clothing products (Table 3.9).

Table 3.9

Egypt: Exports by commodity group, 2008-09 (US$ million)

	2008[a]	*2009[a]*	*Change 2009/2008 (%)*
Total exports	11 831	8 849	-25.2
Petroleum exports	3 942	2 369	-40.9
Crude oil	927	460	-50.4
Other	3 015	1 909	-36.7
Non-petroleum exports	7 890	6 480	-17.9
Raw cotton	151	16	-89.4
Raw materials	1 010	1 226	21.4
Semi-finished goods	1 442	1 358	-5.8
Finished goods	5 287	3 881	-26.6

Note: a=January-May.

Source: Klau (2010), based on data from CAPMAS.

An estimation of the exact number of jobs lost as a result of changes in trade flows during the crisis would require information on elasticities of employment to growth and employment to exports for each sector, which at the time this study was written was not available. As an alternative, a very simple, more qualitative and sector-specific approach was used: the employment impact of the crisis on each sector was judged using

information either from sector-specific studies (El-Haddad and Klau, 2010; Zaytoun, 2010) or gained through interviews with stakeholders or by using historically known employment elasticities (Table 3.10).

The trade-related employment impact of the crisis on Egypt is expected to be most pronounced in the textile and clothing sector and in the tourism sector. A recent impact assessment of Egypt's textile and clothing sector came to the result that a sharp decline in both production (by some 25 per cent) and exports (by some 22 per cent) occurred as a result of the global economic crisis, although textile and clothing companies were the main users of the newly introduced export subsidies (El-Haddad and Klau, 2010). This decline translated into 70,000 job losses, or around 17 per cent of total employment in the sector. The decrease in employment was most pronounced for women and low-skilled workers and among informal companies. Job losses mainly took place in textile companies (74,000), while clothing even experienced a modest growth in production and employment (+3,200).

Tourism is by far Egypt's most important source of foreign exchange and an important generator of employment. Revenues derived from tourism increased strongly between 2003 and 2008, when they reached US $10.8 billion. Total employment in the tourism industry increased from 187,000 in 2003 to 225,000 in 2008. As a result of the global economic crisis, income derived from international tourism fell from US $10.8 billion in 2007/08 to US $10.5 billion in 2008/09. The decline was greatest in the third quarter of 2008/09, when the yearly growth rate amounted to -17.2 per cent (Zaytoun, 2010). The decline in tourist arrivals also affected the construction sector and the local sales of the food industries. A recent impact assessment of Egypt's tourism sector, which is characterized by the relatively high skill level of its employees, came to the conclusion that only few companies reacted with layoffs; rather, companies ceased new appointments, reduced wages and bonuses and introduced compulsory vacations (Zaytoun, 2010). Following the outbreak of the crisis, the tourism sector was subject to a number of special measures under the fiscal stimulus package. This has included the rescheduling of outstanding debt for tourism projects, the provision of loans for new projects and an increase in the public marketing budget for tourism.

Table 3.10

Egypt: Estimated impact of the global economic crisis on labour demand by sector

Sector	*Contribution to GDP in 2007/08*	*Importance in trade, export decline during crisis*	*Employment elasticity*[a]	*Estimated crisis impact on labour demand*
Agriculture and food industries	High, some 13% of GDP	Limited, as production is mainly for domestic consumption	High, with high importance of the sector for overall employment	Limited, as the sector has been sustained by domestic demand
Oil and natural gas production (incl. refining)	High, 16.4% of GDP	High, very strong declines in export revenues	Low	Limited, due to low importance for overall employment
Textiles and clothing	Medium, 2.9% of GDP	High, strong declines in export revenues	High	High, with massive layoffs
Construction	Medium, 4.3% of GDP	Low	High	Limited, as the sector has been sustained by domestic demand and is the main beneficiary of the fiscal stimulus package
Suez Canal	Medium, 3.6%	High, strong declines in export revenues	Low	Limited due to low overall employment
Tourism	Medium, 3.8% of GDP	High, strong declines in export revenues	High	High
Financial services	Medium, 4.1% of GDP	Limited	Medium	Limited due to high inward orientation and low importance for overall employment
Information and communication technology	Medium, some 4% of GDP	Limited	Medium	Limited, due to continued high sectoral growth

Note: a=the classification of sectoral employment elasticities based on El-Ehwany and El-Megharbel (2009).

Source: Klau (2010).

Box 3.5

Egypt: Policy responses to the crisis

In spring 2009, the Government of Egypt introduced a fiscal stimulus package of some 15 billion Egyptian pounds (US $2.7 billion or 1.5 per cent of GDP). The package is strongly focused on public investment, mostly in public utilities (Table 3.11). It also includes some targeted measures, mainly to facilitate exporting and to support the tourism industry and some manufacturing sectors that were affected particularly strongly. Some provisions for social protection, including assistance to low-income households and an increase in the minimum wage, were already in place following the global food price crisis in 2007/08. Although the additional outlays were formally ratified by Parliament in March 2009, several projects under the package were already initiated in September 2008, financed through budgeted contingencies. A second stimulus package was under consideration as at November 2009.

Egypt: Breakdown of the fiscal stimulus package, 2008/09

(million Egyptian pounds)

	2008/09
Overall package	**15 532**
I. Investment expenditure	**10 832**
1. General budget	10 232
Potable water and sewage projects	7 030
Building roads and bridges	1 000
Domestic development projects in various governorates	1 000
Building basic healthcare centres	400
Building schools	150
Other	652
2. Economic authorities	600
Improving the efficiency of railways	400
Executing infrastructure projects for the development of East Port-Said sea port	50
Improving the capacity of Red Sea ports	150
II. Current expenditure (transfers/subsidies)	**2 700**
Increasing competitiveness of Egyptian exports	2 100
Supporting industrial zones in the Delta	400
Supporting logistic areas for internal trade	200
III. Reductions in customs duties and sales tax	**2 000**
Reducing custom duties on some industrial inputs and capital goods	1 500
Temporary lift of sales tax on capital goods	500

Source: Klau (2010), based in information from the Ministry of Finance of Egypt.

contd...

...contd...

In addition, the Central Bank of Egypt provided monetary stimulus measures by reducing the ovemight deposit and lending rates five times between February and July 2009, bringing them down to 8.5 per cent and 10 per cent respectively. Furthermore, with a view to facilitating the access to finance for small and medium-sized enterprises (SMEs), it eased reserve requirements by counting loans to SMEs as reserve requirement holdings of commercial banks.

Source: Klau (2010).

In line with falling overall growth rates, Egypt's unemployment rate increased during the crisis, peaking at 9.4 per cent in June 2009 (Table 3.11). Unemployment remained at this level in the third quarter of 2009. It is interesting to note that the unemployment rate increased between June 2008 and June 2009 even though the total number of employed went up during the same period by over 110,000. Due to lower growth rates, the labour market was not in a position to absorb the majority of new entrants during this period, although at just over 400,000, their number was low in comparison to previous years. This indicates that large numbers of people were discouraged from seeking employment or opted to stay in education. During the same period, the total number of unemployed grew by 300,000, from 2.1 million to 2.4 million.

As mentioned before, women were hit particularly hard by the crisis. This was to a significant extent due to the bad performance of the textile and clothing sector. From June 2008 to June 2009, the female unemployment rate increased from 18.8 per cent to 23.2 per cent, while unemployment among men decreased from 5.4 per cent to 5.2 per cent. The number of women searching for work increased by over 300,000.

Conclusions

The impact of the trade shock resulting from the global economic crisis apparently did not have a strong gender bias at the global level. However, it seems to have aggravated existing gender disparities in some countries, where the bias may have been in favour of or against women. In Egypt, the impact shows a bias against women. This case study has highlighted some of the mechanisms through which this biased effect materialized. The case study also illustrates that the nature of labour

Table 3.11

Egypt: Labour force, employment and unemployment, 2007-09

	Q.1 31/3/07	Q.2 30/6/07	Q.3 30/9/07	Q.4 31/12/07	Q.1 31/3/08	Q.2 30/6/08	Q.3 30/09/08	Q.4 31/12/08	Q.1 31/03/09	Q.2 30/06/09	Q.3 30/09/09
Labour force (thousands)											
M	17 812	18 075	17 902	18 210	18 640	19 173	19 370	19 296	19 123	19 156	19 322
F	5 525	5 350	5 635	6 120	5 550	5 461	5 437	5 699	5 908	5 888	5 882
T	23 337	23 425	23 537	24 330	24 189	24 635	24 807	24 995	25 031	25 044	25 204
Working (thousands)											
M	16 724	17 002	16 828	17 125	17 589	18 135	18 243	18 209	18 130	18 160	18 305
F	4 506	4 332	4 614	4 981	4 412	4 437	4 444	4 577	4 555	4 524	4 541
T	21 230	21 334	21 442	22 106	22 002	22 572	22 687	22 786	22 685	22 684	22 846
Not working (thousands)											
M	1 088	1 073	1 074	1 085	1 050	1 038	1 128	1 087	993	995	1 017
F	1 019	1 019	1 021	1 139	1 137	1 024	993	1 122	1 353	1 364	1 341
T	2 107	2 092	2 095	2 224	2 188	2 063	2 121	2 209	2 346	2 359	2 358
Unemployed rate (%)											
M	6.11	5.93	6	6	6.63	5.42	5.82	5.63	5.19	5.2	5.3
F	18.45	19.04	18.12	18.6	20.5	18.76	18.27	19.69	22.9	23.16	22.8
T	9.03	8.93	8.9	9.1	9	8.4	8.6	8.8	9.37	9.42	9.4

Note: * Preliminary data; figures may not add up to totals because of rounding. Figures do not include those working outside the country.

Source: Klau (2010), based on CAPMAS Quarterly Labour Force Sample Survey.

market effects of a negative trade shock may differ across sectors within the same country. In Egypt, both the textile and clothing sector and the tourism industry were negatively affected by the crisis. Both sectors are employment-intensive. In textile and clothing, a sector characterized by high levels of low-skilled, female labour, the trade shock led to significant employment losses. Low-skilled workers and small informal companies were affected particularly strongly. Conversely, the tourism sector, which is characterized by higher skill levels in employment, retained most of its workers, despite reductions in tourism earnings. This came at the expense of reductions in working hours and wages.

Notwithstanding the negative effects of the crisis, Egypt's economy demonstrated relative resilience to the global economic crisis when compared with other developing and emerging economies, and signs of recovery are evident at the time of the writing of this report. If Egypt continues its policy of opening the country up to foreign trade and investment, policymakers might benefit from the availability of better and more up-to-date datasets and possibly more sophisticated analytical tools. This would improve the Government's ability to assess rapidly the impacts of external shocks, to which the country will inevitably be more exposed.

Notes

1 Smaller economies tend to be characterized by a larger trade to GDP ratio than big economies (Jansen, 2004).

2 IMF World Economic Outlook (WEO) database, accessed February 2010.

3 As the section on Uganda (Section 3.3) will show, the export expansion was mainly driven by ad hoc informal cross-border trade following a devaluation of the Ugandan shilling at the onset of the crisis.

4 This section is based on findings from the ILO's ongoing work in Ukraine under the project *Promoting Economic Diversity in Ukraine: The role of the business enabling environment, skills policies and export promotion.*

5 IMF World Economic Outlook database, accessed February 2010.

6 Due to data limitations, only the manufacturing sector is shown and some subsectors had to be omitted.

7 Kucera *et al*. (2010) provide evidence for the significance of such income-induced effects in the case of India and South Africa.

8 A recent study on Cambodia (Kang *et al*., 2009) found that some poor rural households react to a reduction in income from relatives working in the city by sending more family members to work in the city, thus contributing to the existing surplus of unskilled labour in the cities.

9 This section is based on ILO (2009d).

10 See McMillan *et al*. (2002) regarding the importance of a stable and predictable policy and economic environment for smallholders' decisions in the case of cashew trees.

11 A surge in rice prices in 1979 contributed to Liberia's descent into chaos, sparking riots and a political crisis, leading to the coup d'état that brought President Samuel Doe to power in 1980.

12 According to the report, there are currently 104,100 hectares of uplands and 75,000 hectares of swampland under cultivation for rice production. The labour to land ratio is estimated to be 1.8 workers per hectare on upland and 2.6 on swampland. The same report estimates that in order for Liberia to reach self-sufficiency in rice production, the area under cultivation would have to increase by another 128,000 hectares of upland and 92,000 hectares of swampland, which, using the same labour to land ratios, would mean an additional 470,000 jobs.

13 This section is based on Sender and von Uexkull (2009).

14 All trade data from COMTRADE (United Nations Commodity Trade Statistics Database).

15 The bar showing the value of exports in the first half of 2009 at 2008 prices is calculated as value of exports in 2008 divided by quantity of exports in 2008, multiplied by quantity of exports in 2009. This calculation only gives an indication of the volume change for homogeneous product groups and is thus not presented for obviously non-homogeneous products in Figure 3.10.

16 The export structure is rather diverse, and for simplicity a significant share of exports scattered across numerous products are lumped together in the subgroup "other". For these exports, a small decline is visible in Figure 3.10 from US $216 million in the first half of 2008 to US $205 million in the first half of 2009.

17 As in the case of Liberia, it should also be borne in mind that with imports almost three times as high as exports, a change in import prices has a much stronger absolute effect on Uganda than a change in export prices.

18 Food exports data in figure 3.13 includes exports of agricultural food items that are also consumed domestically in significant quantities, such as beans, maize, groundnuts, bananas and other fruits, but excludes coffee, tea and tobacco. It only shows official exports for which monthly data is available and thus probably severely underestimates total food exports; however, food exports obviously increased, despite domestic food price inflation.

19 According to the ILO (2008), the poorest households in Uganda spend 60 per cent of their income on food.

20 This section is based on Kucera *et al*. (2010).

21 All data from Federal Reserve Bank of India.

22 The decline in food exports is rather surprising given that the presented numbers are changes in real exports (in nominal terms, one would expect a contraction after the food price hike in early 2008). The detailed data before aggregation to the sectoral level shows that in the EU market, the decline is largely driven by a contraction in exports of castor oil. This reveals a possible misclassification in the Indian SAM, as castor oil, traditionally used as a natural medicine and dietary supplement, nowadays is mainly used as an input for the production of cosmetics and other industrial goods. Therefore, it seems plausible that exports were affected severely by the strong decline in industrial production due to the crisis. Given that it is not possible to change the classification in the Indian SAM data, the classification of the trade data was left unchanged, but when interpreting the results for the food industry, this should be borne in mind. In the case of the United States, the contraction is mainly driven by a sharp decline in Indian rice exports. This is not surprising given that the Indian Government imposed an export ban on certain varieties of rice in April 2008 to mitigate the impact of the global food crisis and has not removed it since.

23 For example, registration of new cars in Germany increased by almost 40 per cent, led by mini cars (+140 per cent) and small cars (+93 per cent) (source: Kraftfahrt-Bundesamt), after the Government introduced a 2,500 euro bonus for scrapping and replacing old cars in January 2009. Eventually, Austria, France, Italy, Portugal, Romania, Slovakia, Spain and United Kingdom introduced similar programmes, and so did the United States (however, the American programme started after the observation period of the data and is thus not reflected in the results).

24 This section is based on McDonald *et al*., 2010.

25 The term "low skilled", however, may stand for different things in different countries. Feenstra and Hanson (1997), for instance, highlight that jobs that are considered low-skilled jobs in the United States can turn out to be rather high-skilled in the context of the Mexican economy.

26 COMTRADE database.

27 Because of the assumption that intertemporal adjustments are not permitted, all costs of the shock are concentrated in one period. This is one of the reasons why the simulated reductions in GDP, absorption and private consumption are more severe than those observed in reality. Estimates also generate lower losses under the assumption that imports are shocked by the actually observed change in imports.

28 Robustness checks are presented in the forthcoming working paper (McDonald *et al*., 2010).

29 Data from Arab Republic of Egypt, Central Agency for Public Mobilization and Statistics.

4 Policy responses

Once fears of an imminent collapse of the financial system had subsided, policymakers' attention was drawn to the damage the financial crisis was causing to the real economy. While financial instability had remained rather limited in geographical scope, affecting mainly industrialized and transition economies, the real effects were felt around the globe, and were to a large extent triggered by significant drops in world trade and global investment flows following the financial crisis.

World trade is estimated to have fallen by around 12 per cent in 2009 (OECD *et al.*, 2010). Over the same period, global unemployment is expected to have increased by 0.9 per cent (ILO, 2010a). In the first quarter of 2009, more than half of the countries for which relevant data is available experienced a decline in real wages when compared with 2008 (ILO, 2009c). While developed and transition economies have been strongly affected by the negative developments in labour markets, many developing economies have also experienced a rise in unemployment and underemployment. This was due to the combination of a slowdown in employment growth and the continuing strong growth of the labour force.

Trade is one of the main mechanisms through which the crisis has been transmitted from countries suffering a financial crisis to the emerging and developing world. While openness to trade can in good times be a source of economic and employment growth, it also exposes countries to external shocks, and the current crisis represents a clear example of how this happens. The previous Chapters have provided insights into the mechanisms through which the trade shock affected employment. They also analysed how trade effects trickle down into the parts of the economy that are not directly trade related and provide estimates for the orders of magnitude of the relevant effects. The studies on India and South Africa have shown that indirect employment effects can be of the same order of magnitude as direct effects. The studies on Liberia and Uganda have

illustrated that the impact at the household level can be strong, with resulting effects on household investment decisions.

The previous Chapters have also laid the groundwork for a reflection about appropriate policy responses to crises like the one the world experienced in 2008/09. There appears to be agreement at the global level that increasing protectionism is not the way to go. Little is known, though, about the nature of policy mixes that allow countries to pursue free trade policies, but effectively protect workers against the impact of global shocks. This Chapter provides insights into this question. This is done by combining information on the policy debate in the trade community and in the labour community and discussing it in the light of the country case studies presented above. It turns out that pursuing a dual objective of trade openness and employment protection in times of crisis may be easier than expected at first sight.

4.1 Trade policy and trade finance

One immediate fear arising from turbulences in financial markets was that they would lead to a reduced supply of trade finance. The global market for trade finance (credit and insurance) is estimated to be above US $10 trillion and thus to represent up to 80 per cent of total trade value. It has been estimated that the gap in trade finance could reach up to US $300 billion (Auboin, 2009) and at the London Summit G20 members responded to this threat by committing to make at least US $250 billion available for trade finance over a two-year period. With global trade recovering, it appears that a major crunch in trade finance has been avoided (Mora and Powers, 2009). Indeed, lack of demand for imports may have been a much more important determinant of the reduction in world trade, in accordance with estimates by the World Bank—which at one stage attributed 85-90 per cent of the fall in world trade to falling international demand—and the country-level experiences reported in this report.

Another major concern was the threat of a global spiral of increased protectionism as a consequence of the crisis. It is a generally observed phenomenon that protectionist measures tend to be increased in periods of weak growth, triggered by rising unemployment and low profitability and sometimes insolvability of firms. Indeed, it has been argued that the

protectionist spiral triggered by the economic crisis in the 1920s severely aggravated the growth and employment effects of that crisis (Aiginger, 2009). Aware of this phenomenon, policymakers early on called for a thorough monitoring of trade and investment policies around the globe. G20 leaders asked the OECD, United Nations Conference on Trade and Development (UNCTAD) and the WTO to combine their efforts and produce a report on G20 trade and investment measures to inform policy leaders. Initiatives such as the Global Trade Alert were created, which provide up-to-date information on trade measures introduced during the crisis. So far the evidence points in the direction that there has been some increase in levels of protectionism, but that the feared spiral of ever-increasing levels of protectionism has been avoided. Nevertheless, it is interesting in the light of this study to examine the nature of the measures that have been used and their sectoral coverage.[1]

Three types of measures of particular interest during the crisis episodes are anti-dumping (AD), countervailing duty (CVD) and safeguard measures.[2] All three measures form an integral part of the WTO legal system and can be justified as corrective measures for unfair trade practices or the need to smooth domestic adjustments to economic shocks in a crisis situation. However, experience and economic analysis have shown that such measures are often used as a protectionist device (WTO, 2009). Their use is often closely related to the overall business situation, in particular in the case of AD actions.

The joint OECD, UNCTAD and WTO report to the G20 provides information on the number of AD, CVD or safeguard initiations in the WTO in the years 2008 and 2009. Initiations are not measures and not all initiations of AD, CVD and safeguards will result in definite measures. But initiations may nevertheless distort trade flows because they have a threatening effect.

Between the recession year 2001 and the boom year 2007, the number of reported AD initiations decreased from a record level of 366 to only 163 in 2007. In 2008, a marked increase to 193 initiations could be observed, but initiations dropped back to 153 during 2009 (OECD *et al.*, 2010).

CVD measures to offset the distortions caused by public subsidies have always been far fewer in number than AD initiations. It is therefore

somewhat surprising that the number of CVD investigations registered an important increase between 2008 and 2009. According to OECD *et al.* (2010), their number increased from 8 in 2008 to 26 in 2009. This appears to a large extent to be explained by a change in policy of the United States, which as of 2007 started to allow the initiation of CVD investigations against imports from China. Part of the increase can also be explained by an increased tendency of the European Union and China to trigger CVD investigations.

The number of initiations of safeguard investigations also increased significantly, from 5 in 2008 to 12 in 2009. Most of these investigations were, however, terminated during the course of the year without the imposition of measures. Given that the increase in initiations for both CVD and safeguard measures was concentrated in the beginning of 2009, OECD *et al.* (2010) foresee that 2010 will see reduced activity in both fields.

Table 4.1 shows that 0.41 per cent of world imports and 0.72 per cent of G20 imports have been covered by import-restricting measures imposed by G20 members since the beginning of the crisis. These measures thus affect only a small proportion of trade flows. The sectoral distribution of measures introduced during the crisis corresponds to a large extent to that traditionally observed, according to WTO, 2009. The products most frequently affected include: iron and steel, electrical machinery and parts, ceramics and glassware, machinery and mechanical appliances, and chemical and plastic products. Textiles and clothing have also been targeted by these measures. Ukraine, one of the countries discussed in this report, was among the targets of the AD investigations in the iron and steel sector (Box 4.1).

4.2 Sectoral and company-specific stimulus programmes

The first-order effects of changes in trade flows are often concentrated in specific sectors. The previous Chapters have shown that in individual cases, such sectoral shocks can trigger significant reductions in production, employment and/or wages. As a result, the crisis has led to repeated calls for sector-specific policy interventions in many countries. In some cases,

these took the form of calls for protectionism; in others, sectoral-stimulus packages or bailouts of struggling companies were called for. It is widely accepted that both types of sectoral policies carry the potential to distort trade. Standard trade models also predict that such policies would tend to reduce welfare, in particular if they trigger tariff or subsidy "wars" across the globe. Yet those insights are based on models that evaluate the effects of sectoral policies in a stable economic context. Little is known about their effects in a situation of global crisis, as the one this study focuses on.

Table 4.1

Share of trade covered by new import-restricting measures of G20 members (percentages)

Description	*Share in total world imports*	*Share in G20 total imports*	*Share in total affected imports*
Total imports affected	0.41	0.72	100
Agriculture (HS 01-24)	0.02	0.03	4.7
Live animals and products	0.02	0.03	3.9
Vegetable products	0	0	0.7
Fats and oils	0	0	0
Prepared food etc.	0	0	0.1
Industry products (HS 25-97)	0.39	0.69	95.3
Minerals	0.19	0.33	45.7
Chemical and products	0	0.01	0.7
Plastics and rubber	0.02	0.03	4.5
Hides and skins	0	0	0.3
Wood and articles	0	0.01	0.9
Pulp, paper etc.	0	0	0.4
Textile and articles	0.02	0.04	5.9
Footwear, headgear	0	0	0
Articles of stone	0	0	0.7
Precious stones etc.	0	0	0
Base metals and products	0.07	0.12	17
Machinery	0.06	0.1	13.5
Transport equipment	0.01	0.03	3.6
Precision equipment	0.01	0.01	1.6
Arms and ammunition	0	0	0
Miscellaneous manufactures	0	0	0.4
Works of art etc.	0	0	0

Source: WTO Secretariat estimates, reported in OECD *et al.*, 2010.

Box 4.1

Anti-dumping initiations against Ukraine's metallurgy exports since the begining of the crisis

According to the Global Trade Alert database, Ukrainian metallurgy exports have been the target of nine new anti-dumping investigations since the onset of the crisis, as shown in Table 4.1.

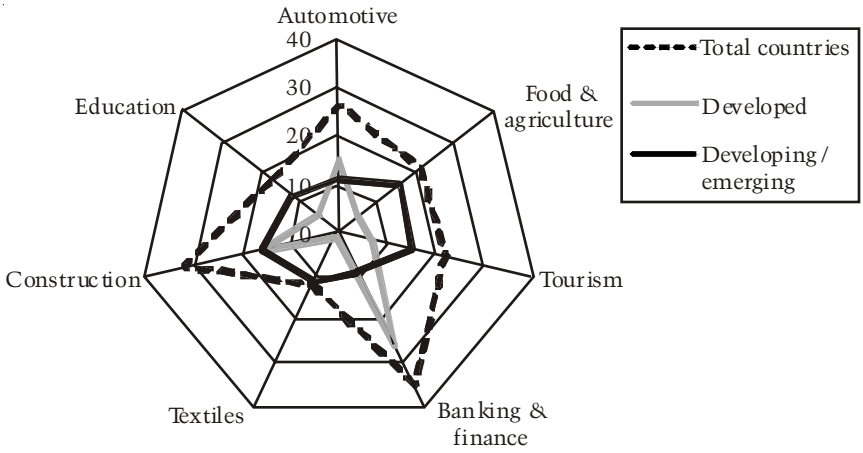
Implementing jurisdiction	*Affected*	*Description*	*Implemented*	*Date of inception*
Russian Federation	Ukraine only	Initiation of review of anti-dumping duties on steel tubes from Ukraine	Yes	30/12/09
India	32 countries	Preliminary affirmative safeguard decision concerning imports of hot-rolled coils/sheets/strips	No	23/04/09
Russian Federation	Ukraine	Initiation of the anti-dumping investigation against Ukrainian rolls for metal-rolling mills	Yes	17/07/09
Russian Federation	29 countries	Extension of the safeguard duty on tubes of large diameter for another 3 years	Yes	17/12/09
Canada	Ukraine only	Definitive anti-dumping duty on certain carbon steel plate and high-strength low alloy plate from Ukraine	Yes	9/06/09
European Council	3 countries	Anti-dumping investigation on welded tubes/pipes and hollow profiles of square or rectangular cross-section (of iron other than cast iron or steel other than stainless) from Ukraine, Belarus and Turkey terminated	Yes	9/04/09
Pakistan	5 countries	Initiation of anti-dumping investigation on imports of hot-rolled steel coil originating from Belgium, Japan, Russia, Ukraine and United States	No	4/09/09
Russian Federation	23 countries	Safeguard investigation of screws, bolts, nuts, washers of iron or steel	Yes	4/05/09
India	14 countries	Initiation of anti-dumping investigation on hot-rolled steel products	No	11/28/08

Source: Global Trade Alert.

Monitoring the impact of sectoral stimulus packages is challenging because of the difficulty of collecting and interpreting relevant information and because impacts will often depend on how the package has been implemented. During the global economic crisis, the term "stimulus package" was often associated with bailouts in the banking and insurance sector and the need to preserve financial stability. Yet,in many cases, stimulus measures targeted other sectors or were explicitly directed towards export activities. Evenett (2009) argues that the majority of bailouts implemented after the first G20 crisis summit in November 2008 were not related to the financial sector. A similar picture emerges from evidence collected by the ILO's Sectoral Activities Department (Figure 4.1). The financial sector remains the single most targeted sector in terms of numbers of measures, but it is closely followed in this ranking by the construction sector (which covers infrastructure measures). Taken together, textiles, construction, automobiles, food and agriculture, and tourism have been targeted by more measures than the finance sector.[3] Note that this is true when simply counting the numbers of measures introduced. This picture may look different when the values of the measures are taken into account. To evaluate the economic effects of sectoral measures, it would be more appropriate to use information on values, but this information is difficult to collect and difficult to compare across countries.

Figure 4.1

National stimulus plan measures by targeted economic activity



Source: ILO Sectoral Activities Department, 2010b, based on national stimulus plans.

OECD *et al.* (2010) express concerns about the competition-distorting effect of the subsidy components of such measures, in particular if the measures are characterized by "buy/invest/lend/hire local" requirements. The OECD report also emphasizes the risks that related subsidies will distort production and investment decisions if they remain in place too long. Accordingly, the report suggests that sectoral policies should be among the first policies to be unwound in the aftermath of the crisis. To be more precise, the report suggests the following sequence when unwinding crisis-related measures:[4]

1. protectionist measures at the border;
2. provisions behind-the-border that discriminate between domestic and foreign goods or firms;
3. sector-specific measures, especially those "that support capital rather than labour";
4. specific consumption subsidies;
5. generic consumption subsidies.

In other words, the report advises to dismantle sector-specific policies first, because of their strong potential to cause economic distortions. The report also suggests to dismantle sector-specific measures targeting capital earlier than those targeting employment.

At this point, it is useful to have a closer look at the different ways in which sector-specific measures can be designed. They can, for instance, be related to exports of the relevant sector, be defined as a production subsidy, facilitate adjustment of a sector (for instance towards greener technologies) or lower the labour costs within the sector. Export subsidies are in conflict with multilateral trade law and all the other measures are "potentially problematic" and can, in principle, be challenged under that law. From the point of view of employment generation, measures facilitating sectoral adjustment or lowering the costs of employment would probably be considered desirable, particularly in a crisis context. The distinction made in OECD *et al.* (2010) between sector-specific measures that target labour and those that target capital is, therefore, interesting, as it indicates that those targeting labour may also be considered less problematic—from the trade point of view—than those targeting capital.

The objective of employment creation and retention is at the heart of the policy package contained in the Global Jobs Pact, adopted unanimously by the government, employers' and workers' delegates at the International Labour Conference in June 2009. This global policy instrument addresses the social and employment impact of the global economic crisis. It emphasizes the need to promote employment generation across sectors in its Principles for Promoting Recovery and Development. Among its Decent Work Responses, the Pact also promotes the idea of supporting job creation across sectors and contains an explicit reference to the support of job creation and the promotion of investments in employment-intensive sectors. Although this last reference contains an element of sector specificity, the policy message coming from the Global Jobs Pact appears to be very much in line with the one coming from the above mentioned joint OECD-UNCTAD-WTO report. The Pact provides strong support for economy-wide measures and for sectoral policies with a clear employment target.

In this context it is worthwhile pointing out that infrastructure is typically considered to be a very employment-intensive sector, and at the same time a classical domain of government investment. The ILO (2009b) reports that US $1 billion spent on large infrastructure projects is expected to generate around 28,000 jobs in advanced economies, according to evidence presented in Levine (2008). The employment impact is expected to be significantly higher in developing countries (Tuck *et al.*, 2009). In many countries, infrastructure projects have been an element of stimulus packages implemented during the crisis. The ILO (ILO Sectoral Activities Department, 2010b) reports as many as 30 examples of countries that have introduced such programmes: Table 4.2 shows some examples. Support to investment in infrastructure projects would typically not be considered a source of trade distortion, as infrastructure itself is not traded. Indeed, high-quality infrastructure is expected to reduce trade costs and thus to facilitate trade. In fact, it has in many cases led to a direct positive effect on long-term growth.[5] Infrastructure projects thus appear as a possible candidate for a sectoral crisis policy that has the potential to create employment and—in the medium term—trade without distorting the economy. Perhaps the largest problem is that it is difficult to identify and launch useful investment projects quickly enough for them to become effective during the crisis. Another possible drawback of infrastructure

investment as a crisis mitigation tool is that its main employment creation effect is probably in construction, a sector typically dominated by male employment. The gender impact of such measures should therefore be carefully considered, especially in countries where the main impact of the crisis is on female employment.

Table 4.2

Examples of infrastructure programmes contained in stimulus packages

Country	*Worth*	*Description*
China	US $556.70 bn	Stimulus package emphasis in: rural infrastructure construction, railway expansion, airport construction and greater spending on hospitals and schools in rural areas.
India	US $20 bn + max. US $5.15 bn	The funding is expected to support a PPP programme of US $20 bn in the highway sector and port and power projects. Non-bank finance companies dedicated to infrastructure financing have also been allowed to raise funds from multilateral or regional institutions and will be provided up to US $5.15 bn.
Brazil	US $212.6 bn	"Program of growth acceleration" (PAC) consists of BRL 503.9 bn (US $212.6 bn) for projects in: logistics, energy, and social infrastructure. In addition, the Government has launched a programme which aims to build 1 million houses in 2009 and 2010.
United States	US $200 bn	Around US $200 bn to modernize and improve the infrastructure as part of its recovery and employment generation efforts. The Recovery and Reinvestment Act also includes US $5.55 bn for green modernization and renovation of federal buildings.
United Kingdom	£ 3 bn	£3bn (from the £20 bn stimulus package) of capital spending to be brought forward from 2010/11, with multiple initiatives aimed at transportation, schools, housing and environmental efficiency initiatives.
Kenya		Spending on development rose from by 83 per cent from the previous year, facilitating investment in energy, roads, water suppliers and irrigation schemes.
South Africa	US $60 bn	US $60 bn over the next 3 years on infrastructure, including power generation, with the revamping of power stations and two new coal fired power plants; transportation, including the improvement of rail infrastructure, expanding harbours and ports and the construction of a liquid fuels pipeline.

Source: ILO Sectoral Activities Department (2010b).

4.3 Cross-sectoral measures

Apart from providing targeted support to struggling industrial sectors, many countries implemented measures that are cross-sectoral in nature and typically target those losing out from the crisis, such as the unemployed or those at risk of losing their job, the poor and groups who are particularly vulnerable, such as the young or the elderly. Such measures tend not to be problematic from the point of view of the multilateral trading system as they are considered to be less distortive for trade. Such programmes are also generally considered to offer an effective cushion against negative shocks (Paci *et al.*, 2009).

Most of these policies can be expected to have a positive effect on demand, but their specific mechanisms and targets vary considerably. The effects on employment are also likely to differ across measures. The following is an attempt to categorize these measures into three groups: expenditures targeting the poor, tax reductions and labour market policies; although individual measures often contain elements of all three categories. The inherent strengths and weaknesses of the different types of approach are also briefly discussed.[6]

Examples of measures targeting the labour market are increments in minimum wages or reductions in labour costs (for instance in the form of reductions in social security contributions) designed as economy-wide measures. The most common labour market policy instruments in stimulus packages used during the crisis included the extension of unemployment benefits and programmes for retaining workers, such as through subsidies for part-time work arrangements and extended holiday and training periods. For example, Germany extended government subsidies for *Kurzarbeit*, a scheme that retains workers at shorter hours and lower pay in times of crisis, from six month to 18 months. In some countries—including Morocco and Ukraine, referred to in this study—subsidies have been disbursed to producers under the condition that employment levels would be more or less maintained. Such conditional subsidy programmes have, however, frequently been limited to a number of sectors. Labour market policies aimed at retaining workers in their jobs during times of crisis have the advantage that they avoid transaction costs for workers and employers that result from laying off and eventually

rehiring workers. However, the danger is that they may hamper adjustment to the crisis and thus slow down recovery.

Most stimulus packages contained measures that took the form of cash transfers. For example, Brazil and Mexico extended their cash-transfer programmes, the United States extended spending on public health, disability benefits and food stamp programmes, and South Africa lowered the pension age and increased the maximum age for child support to 18. Most measures were in the fields of cash transfers, housing support, child benefits and pensions. In terms of their effect on demand, an advantage of spending measures targeted towards the poor is that on average, poor households spend a higher proportion of their income on consumption and put less into savings. A problem with social protection measures, especially for developing countries with weak pre-existing social protection nets, is to build up an efficient disbursement mechanism. Countries with strong pre-existing disbursement mechanisms were able to scale these up much more rapidly.

Reductions on various tax instruments, such as personal income tax, indirect taxes and various forms of corporate taxes, were also common in stimulus packages. For example, the United States granted tax credits in personal income tax and the United Kingdom reduced value added tax from 17.5 per cent to 15 per cent. While corporate tax measures were often aimed at specific sectors, some also applied across the board or were specifically targeted at SMEs. The advantage of tax credits is that they are relatively quick and easy to disburse. However, only taxable income earners benefit from tax credits, and thus the poorest members of society are left out. Apart from equity considerations, this also reduces the multiplier effect on demand as richer households typically have a lower propensity to spend additional income on consumption rather than savings.

4.4 Policy conclusions

A large variety of different policy packages have been introduced by governments around the globe during the crisis; the size and characteristics of each package are likely to have been determined to a large extent by the government's fiscal space and its institutional capacity to implement crisis measures rapidly. So far, no comprehensive analysis has been carried out of

the employment and trade effects of the different measures. OECD *et al.* (2010) emphasize that measures that are protectionist or focus on specific sectors are likely to distort trade. The discussion above reveals that infrastructure projects may—in general—be considered to be different from other sectoral policies, in that they have weaker potential to be trade distortive in the short term and are likely to stimulate trade in the long term. A recent ILO evaluation of fiscal stimulus packages also identified infrastructure spending as a standard component of successful stimulus packages and praised its large potential for employment creation (ILO, 2010b).[7] The same evaluation emphasized the positive role of social protection systems that were in place before the crisis. Such systems represent an automatic stabilizer in crisis episodes. Once in place, they can also rather easily be scaled up or targeted towards the most vulnerable groups in the society, such as low-income households or youths.

How are sector-specific measures generally likely to perform from the point of view of containing the overall negative employment effects of trade in the light of the evidence provided in this study? The evidence reported in Chapter 3 indicates that three types of employment effects are likely to occur in response to a negative trade shock: employment effects in the sector directly affected by the trade shock; indirect employment effects through input-output connections between sectors; and income induced effects—for example, reductions in consumer spending when household incomes decline as a result of the first two effects. The evidence also indicated that income-induced effects can be of a similar size as the other two effects together. Sectoral measures (for example, in the form of production subsidies) that stimulate production in the trade sector can in principle neutralize the negative trade shock, thus impeding all three types of negative employment effects. But they have the important drawback that they lead—in the context of a global demand slump—to an excess supply of final products. Sectoral measures that target the maintenance of employment in the trading sector impede employment losses in that sector and reduce the income-induced effects. But to the extent that production is lowered in the exporting sector, the indirect employment effects through input-output effects are still likely to materialize. Sectoral employment measures are therefore likely to address only a part of the negative employment effects created by a trade shock. Cross-sectoral measures that

target employment or the unemployed, thus seem to be preferable to sectoral support.

Notes

1 Increases in applied tariffs have been very rare during the crisis and are not discussed separately here.

2 See WTO (2009) for a comprehensive legal and economic discussion of these types of measures.

3 The construction sector includes all type of infrastructure activities.

4 This order of policies is based on CGE simulations produced by the OECD and published in OECD (2009).

5 Similar arguments can be made for investment in development and adoption of green technologies.

6 This section draws heavily on Jha (2009).

7 The document summarizes the experiences of Australia, Brazil, Canada, Egypt, Germany and the Republic of Korea during the crisis.

5 Conclusions

This study was written at a time when world growth timidly started to recover after the most severe financial and economic crisis since the Great Depression. The crisis was severe, and it was truly global. With the financial sector paralysed in a number of major economies, global trade and foreign direct investment flows were rapidly affected, with the result that most countries in the world felt the impact of this crisis.

The economic slowdown was quick to impact on employment levels and conditions, and while growth is picking up, employment levels in many countries have not yet bottomed out. Labour markets in OECD and post-Soviet countries are among those having taken the hardest hit, mainly because they were affected by both the financial and the trade impact of the crisis. But also countries with relatively sheltered financial systems felt substantial employment effects. As such, the crisis offers a very telling illustration of the fact that openness and integration into global markets expose domestic labour markets to foreign bred shocks.

Yet, openness also has the potential to contribute to employment growth in good times, and it helps to buffer countries against domestic or regional shocks. With this in mind, policymakers around the globe pledged not to resort to protectionism during the crisis. The ILO's response to the crisis, the Global Jobs Pact, reflects the idea that a rise in protectionism would not be beneficial for the recovery of labour markets. While it has been relatively easy to reach a common understanding on "what not to do" during the crisis, the answer to the question "what to do?" has turned out to be more difficult.

In order to understand how to support labour markets exposed to an external shock, it is important to understand the mechanisms through which an external shock affects a domestic economy and the effects it is likely to have on employment levels and conditions at the aggregate and household levels. This study provides insights into both aspects, based on

six in-depth studies covering seven countries, conducted or commissioned by the ILO in the second half of 2009. The studies cover two low-income countries (Liberia and Uganda), three lower middle income countries (Egypt, India and Ukraine) and two upper middle income countries (Brazil and South Africa) and they focus on the employment effects of changes in trade flows during the crisis.

The first conclusion that can be drawn from this country-level work is that the employment effects of the crisis-related trade shock have differed significantly across the seven countries. The level and nature of employment effects depended to a large extent on a country's level of openness and its export structure. There was also strong variation in how reduced demand for labour caused by the trade shock manifested itself; in some cases (Uganda, tourism sector Egypt) this was mainly in terms of reductions in wages or working time. Brazil, the Egyptian textile sector, and South Africa, however, experienced a significant contraction in terms of the quantity of employment. The Ukraine and Liberia studies showed evidence of both employment and wage reductions, as well as increasing wage arrears. In Liberia and Uganda, there was also evidence for increasing casualization of labour.

Despite these differences, the analysis of the seven country cases does allow for some general conclusions:

- The employment effects of the trade shocks have been significant in all countries, and large in several of them, underlining the need for policy responses to take into account the trade-employment linkage. Employment effects have been particularly severe in countries with exports concentrated in the sectors that experienced the largest drop in trade during the crisis, such as iron and steel and products related to automobiles.
- The trade shocks have often contributed to increased pressure on nominal wages, partly by undermining the bargaining position of workers. Given that the global financial and economic crisis was preceded by sharp hikes in global food prices, the resulting cuts in real incomes have been severe in some cases, in particular for

poor workers, who spend a significant proportion of their income on food.

- The employment effects of the trade shocks are not restricted to trading sectors but affect the entire economy. This happens through two channels: a reduced demand for supplies by exporting companies, and a general reduction in demand because of reduced incomes in the exporting sectors. Estimates presented in this study show that up to half of the employment effects triggered by the trade shocks may be the result of such income-induced effects.
- Trade shocks have an effect on the functional and gender distribution of income. The direction of that impact can be predicted reasonably well on the basis of traditional trade models.
- Volatility in global markets is likely to have long-term effects on economies because of its effect on investment decisions by companies and households. The household decisions most likely to be affected are those relating to migration and education. Volatility can also have a long-term effect on the distribution of the gains from investment. This happens, for instance, through its effect on the bargaining power of parties involved in the negotiation of concession agreements or wages.

Governments have responded to the crisis by introducing different types of crisis measures. In addition to significant stimulus packages targeting the financial sector in the most affected countries, governments around the world have introduced measures to help the real economy cope with the crisis. For the sake of this study, those measures have been grouped into three types: measures to protect domestic producers against imports, sector-specific measures and cross-sectoral measures. The first type of measure clearly conflicts with the spirit of multilateral trade agreements and is not expected to have a particularly positive impact on employment. The second type of measure also has the potential to distort trade and therefore to conflict with multilateral trade agreements. Three main players of the multilateral trade system—the OECD, UNCTAD and WTO—have, however, signalled that sectoral measures targeting

employment are likely to be less problematic than those targeting capital. Infrastructure projects are also less likely to be trade distortive and have been identified as having strong multiplier and employment creation effects. Such projects are therefore strong candidates for successful stimulus packages, both from a trade and an employment point of view.

Measures targeting consumption (such as in the form of income support) or employment in general (that are not specific to certain economic sectors) have played a very positive role during the current crisis. Where they were based on social protection systems or labour market legislation already in place, they could rapidly be scaled up and targeted towards vulnerable groups in the society. With a minimal potential to distort trade flows, such measures therefore perform extremely well with regard to both the employment and trade objectives.

Most measures mentioned so far require funding and fiscal space is therefore a precondition for introducing them. One element of good crisis management that so far has not been mentioned does not require fiscal space: strong social dialogue between employers, workers and governments can be very helpful for the design of appropriate policy packages in times of crisis. Social dialogue may turn out to be the most crucial element of crisis management in countries with no or low fiscal space. In countries that cannot stimulate the economy through monetary transfers or tax reductions, the government has an important role to ensure that the losses from negative external shocks are distributed in such a way that excessive social hardship is avoided and long-term negative consequences for growth are minimized. Encouraging dialogue with and between employers and workers increases the chances of finding solutions that guarantee both enterprise survival and minimal losses for individual households. Such solutions should not, however, necessarily target preservation of the status quo, but should take into account that a successful crisis strategy may want to stimulate adjustment among enterprises and workers.

At the time of the writing of this study there are signs that the world has started to recover. With respect to the current crisis, the policy advice described in this study will therefore be most useful for indicating an order of priorities in the unwinding of crisis packages. Measures targeting consumption or employment at large should be the ones to be maintained

longest, in particular those targeting the most vulnerable groups in society. But this study also contains a strong policy message for the future. With the levels of global financial and trade openness achieved—and maintained during the crisis—individual economies will continue to be vulnerable to external shocks. The debate on whether global volatility has increased is so far unresolved, but there is a chance that external shocks will become more frequent. It is of crucial importance to prepare economies for such shocks during periods of economic growth. Creating fiscal space during times of growth should be a priority for policymakers at the national and international levels. But emphasis should also be given to strengthening administrative capacity in general and social protection systems in particular during growth periods. Social protection systems represent automatic stabilizers in times of crisis, and if they are in place before the crisis they can be rapidly scaled up or retargeted if administrative capacity allows. The need to build up fiscal space should therefore not be considered a constraint for strengthening social protection systems. Strong social protection systems are a crucial element of a sustainable system of global trade and contribute to minimizing the negative growth effects of global volatility.

Annexes

Annex 1

Description of variables in cross-country data on crisis impact and potential transmission channels

Variable	*Source*	*# Obs.*	*Mean*	*Minimum*	*Maximum*
Change in Real GDP growth in 2009 compared to the average for 2005-07	IMF	84	-5.9%	-29.2%	3.5%
Change in the Unemployment Rate between 2007 and 2009	Various National and International Sources accessed via Economist Intelligence Unit	43	0.9%	-1.7%	10.6%
Merchandise Trade / GDP in 2007	World Development Indicators (World Bank)	84	69.8%	21.5%	173.1%
Services Trade / GDP in 2007	World Development Indicators (World Bank)	84	19.7%	4.0%	92.9%
Inflow of Remittances / GDP in 2007	World Development Indicators (World Bank)	84	7.0%	0.0%	45.5%
Inflow of Aid / GNI	World Development Indicators (World Bank)	84	5.0%	0.0%	47.9%
Stock of Foreign Direct Investment / GDP	World Investment Report (UNCTAD)	84	36.3%	1.1%	117.5%
Short-Term Debt / (Exports & Income)	World Development Indicators (World Bank)	84	15.3%	0.0%	124.6%
Population Size	World Development Indicators (World Bank)	84	46,300,000	103,066	1,320,000,000
Per capita GDP in US$	World Development Indicators (World Bank)	84	3,341	125	13,201

Annex 2

Selected countries, exports by major product group, 2008

	Merchandise & Commercial services	*A. Total Merchandise*	*A.1 Agric. prod.*	*A.2 Mining prod.*	*A.3 Manu-factures*	*A.3.1 Iron & Steel*	*A.3.2 Automotive prod.*	*A.3.3 Textile & clothing*	*A.3.3.1 Clothing*	*A.3.4 Office & Telecom*	*B. Total Serv.*	*B.1 Travel Services*
A. Billion dollars												
India	279.7	177	21.2	43.3	112.2	11.2	4.9	21.2	10.9	1.7	102.7	11.8
Brazil	226.8	198	61	43.7	86.4	13.7	14.7	1.7	0.3	3.1	28.8	5.8
South Africa	93.2	81	7	28.5	44	8.9	7.7	0.4	0.1	0.9	12.2	7.6
Ukraine	84.3	67	11.3	8.7	46.6	25.5	1.1	1	0.7	0.7	17.3	5.7
Egypt	48.7	24	2.8	11.4	8.2	1.2	0.1	2.4	1.6	0	24.7	10.6
Uganda	2.6	2	1	0.1	0.6	0.1	0	0	0	0.1	0.6	0.4
Liberia												
B. Shares												
India	100	63.3	7.6	15.5	40.1	4	1.8	7.6	3.9	0.6	36.7	4.2
Brazil	100	87.3	26.9	19.3	38.1	6	6.5	0.7	0.1	1.4	12.7	2.6
South Africa	100	86.9	7.5	30.6	47.2	9.6	8.3	0.4	0.1	1	13.1	8.2
Ukraine	100	79.5	13.4	10.3	55.3	30.2	1.3	1.2	0.8	0.8	20.5	6.8
Egypt	100	49.3	5.8	23.4	16.8	2.5	0.2	4.9	3.3	0	50.7	21.8
Uganda	100	78.4	39.2	3.9	23.5	3.9	0	0	0	3.9	21.6	15.7
Liberia												
World	**100**	**80.6**	**6.9**	**18.1**	**53.6**	**3**	**6.3**	**3.1**	**1.9**	**8**	**19.4**	**4.9**

Source: Finger (2010), based on data from WTO, International Trade Statistics (2009), and authors' calculations.

Annex 3

Description of the model and data used for the South Africa and India study[1]

Model description

A social accounting matrix (SAM) is a representation of national accounts showing the two-way flows of economic transactions in a country. SAMs for India and South Africa—for 2003/04 and 2000, respectively—are used in a Leontief multiplier model to estimate the effects of trade contraction in the crisis on employment and incomes. Main results use Type II multipliers, which address not only direct and indirect effects (as with Type I multipliers) but also effects resulting from changes in household income expenditures. The structure of these SAMs enables detailed estimates of industry-level employment effects for tradable and non-tradable industries, broken down by sex and education, as well as income effects among rural and urban households by income quintiles.

For employment, the Leontief multiplier model is defined as:

$L=\hat{E}[(I- A)^{-1} T]$,

where:

$\boldsymbol{L}$ = the vector of changes in industry-level employment associated with the changing structure of trade, expressed as full-time equivalent (FTE) jobs lasting one year;

$\hat{\boldsymbol{E}}$ = the diagonal matrix of industry-level labour coefficients (employment per unit of output);

$\boldsymbol{I}$ = the identity matrix;

$\boldsymbol{A}$ = the average propensity to spend matrix; and

$\boldsymbol{T}$ = the industry-level export demand vector.[2]

$\boldsymbol{T}$ is defined for each industry as the difference in exports between early 2008 and early 2009, a period of particularly rapid trade contraction during the crisis. More specifically, $\boldsymbol{T}$ represents the annualized difference in exports between the three-month period from February to April of these years. Because industry values for $\boldsymbol{T}$ are mainly negative, using $\boldsymbol{T}$ in the Leontief multiplier model yields estimates of what we define as "jobs lost" during the crisis as a result of trade contraction.

Because of the limited availability of recent data at the industry level, $\boldsymbol{T}$ is constructed from exports from India and South Africa to the European Union and the United States, not exports to the world. Yet the European Union and the United

States were important export markets for India and South Africa and were hit quickly and hard by the crisis, and so in our view provide a useful if partial account of the effects of the crisis through trade contraction.

Results are broken down between male and female workers and more- and less-educated workers. In this sense, the approach used allows for the evaluation of the effects of trade contraction on employment inequality as well as income inequality. Less-educated workers are defined as those having no more than lower secondary education, equivalent to eight years of education in India and nine years in South Africa.

Though the Leontief multiplier model has been widely used in the literature on trade and employment, it nonetheless has well-known limitations, in particular that it is linear and non-dynamic. Positive dynamic effects through economic growth or negative dynamic effects through trade-induced labour-displacing technical change (Jonsson and Subramanian, 2001; Wood, 1994) therefore cannot be addressed. Yet we do not regard these as serious limitations on our estimates, given the short time frame considered and the contractionary effects of the crisis more generally. Note also that $\hat{\boldsymbol{E}}$ is based on employment and output data for the SAMs' base years, which are some years prior to the crisis. Given trends towards labour-displacing technical change (more output with less employment), this suggests that our employment estimates may be somewhat on the high side in this regard.

The scope of the exercise is necessarily limited by the databases used in the analysis. The SAMs and labour force surveys used are intended to cover both formal and informal sectors, and in this sense are comprehensive. But our trade data for the European Union (from Eurostat) and the United States (US International Trade Commission) do not include trade in services. The analysis does, however, address indirect and income-induced effects on service industries. For the sake of expediency, we define tradable goods industries as those for which we have trade data and define all other industries as non-tradable, including service industries.

Trade data description

The process of obtaining and preparing and cleaning the data used for the trade demand vectors followed the procedure outlined below:

1. Download monthly import data at the HS 8-digit (HS8) level from the European Union (Eurostat) and the United States (US International Trade Commissions) for imports from India and South Africa, going back to the base year of each SAM (2003 for India, 2000 for South Africa).

2. Calculate the constant price for each product at the HS8 level as the average unit value in the base year. If there are no observations for the base year, use the next available year with data (this was the case for 25 per cent of the total trade value). If no quantities are reported for this product for any year, use the current value (this is the case for 3 per cent of the total trade values).

3. Calculate the constant price value of trade flows for each month as the product of the quantity imported and the constant price calculated under (2).

4. For the EU data, convert Euro values to US dollar using the average exchange rate in the base year.

5. Aggregate the data from the HS8 level to the sector level used in the SAMs.

   As is common when dealing with unit values based on trade data, the initial data preparation procedure led to substantial problems with outliers. The following cleaning steps were applied. The procedure was fine-tuned by carefully reviewing fluctuations at the product and sector levels, and—whenever possible—comparing the fluctuations in unit values with fluctuations in international commodity prices reported by the Global Economic Monitor (World Bank).

6. Most outliers result from unit values calculated based on very small trade flows. Therefore, for the purpose of calculating the unit values, trade flows were ignored if:

   a. the quantity (in whichever unit it is measured) was below 1;

   b. non-zero trade flows were reported for fewer than three months in a given year; and

   c. trade flows in a given year add up to less than 1/15th of total trade for this product over the whole period of observation.

   As a result of this procedure, the value of trade where a year other than the base year had to be used for the calculation of the unit values increased from 25 per cent to 42 per cent of total trade, and the value of trade where no unit value could be calculated and the current value had to be used increased from 3 per cent to 25 per cent.

7. To avoid a strong impact of the few remaining outliers, a maximum of 5 and a minimum of 1/5th was imposed on the deviation of the constant

price value from the current price value in any month. This affected less than 1 per cent of total trade.

8. Two ad hoc cleaning steps were imposed for export sectors where quantity information in the export data, after careful review, was considered inconsistent or not credible. In these cases, the current values were used instead of the constant values.

    a. South Africa: for exports to the United States of leather products (<0.5 per cent of total exports to United States).

    b. India: for exports to the European Union of miscellaneous manufacturing products (9 per cent of total exports to European Union).

In order to analyze the impact of the global economic crisis on trade, we chose the months February-April 2009, when global trade was arguably at its low-point, in comparison with the same three months in 2008. In order to make it compatible with the other data in the SAM, we annualized the data for each sector. We did this by dividing the exports in February-April by the median share of these months in total exports in the previous years, going back to the base year. This procedure leads to an outlier for coal exports from South Africa to the United States, caused by very low and very sporadic coal exports in just a few months over the observation period. To avoid this problem, we set coal exports from South Africa to the United States to zero. The change in the trade demand vector was then defined as the difference between the annualized exports in February-April 2009 and the annualized exports in February-April 2008. The results from this estimation can be interpreted as the jobs actually lost due to the contraction in exports to the United States and the European Union.

Annex 4

Detailed results of the modelling exercise for India

	Total Output (2003 Rs. Mln.)	*Exports to EU & US, annualized from Feb-Apr 2008 (2003 Rs. Mln.)*	*Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rs. Mln.)*	*% Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rs. Mln.)*	*Total Employ-ment (FTE)*	*Pred. Total Employ-ment Change (FTE)*	*Pred. % Total Employment Change (FTE)*	*Pred. Type 1 Employ-ment Change (FTE)*	*Pred. % Type 1 Employ-ment Change (FTE)*
Agriculture	6,746,172	59,733	-10,219	-17.1%	205,076,487	-2,200,245	-1.1%	-779,505	-0.4%
Forestry and logging	296,880	12,775	-1,382	-10.8%	990,055	-13,864	-1.4%	-7,385	-0.7%
Fishing	316,720	22,883	6,792	29.7%	1,285,097	17,821	1.4%	25,828	2.0%
Coal and lignite, crude petroleum, natural gas	650,420	2	3	164.5%	770,568	-8,881	-1.2%	-5,276	-0.7%
Iron ore, other minerals	146,770	12,645	-6,783	-53.6%	1,517,992	-36,065	-2.4%	-34,607	-2.3%
Manufacture of food products	2,090,535	48,879	-16,036	-32.8%	4,024,149	-59,061	-1.5%	-31,451	-0.8%
Beverages & tobacco products	620,452	1,262	78	6.2%	3,763,220	-27,679	-0.7%	-1,049	0.0%
Cotton textiles	690,866	21,500	-6,272	-29.2%	2,506,482	-61,024	-2.4%	-46,344	-1.8%
Wool synthetic, silk fibre textiles	373,047	20,591	-4,955	-24.1%	1,917,877	-38,634	-2.0%	-28,950	-1.5%
Jute, hemp, mesta textiles	50,633	2,563	-1,093	-42.7%	180,198	-7,742	-4.3%	-6,731	-3.7%
Textile products	625,034	448,970	-16,271	-3.6%	5,537,224	-152,035	-2.7%	-127,352	-2.3%
Furniture and wood products	162,021	13,932	-2,960	-21.2%	5,365,221	-169,379	-3.2%	-145,248	-2.7%
Paper, paper prods. & newsprint, Printing and publishing	467,791	9,718	-534	-5.5%	1,270,760	-11,392	-0.9%	-5,435	-0.4%
Leather products	167,841	91,920	-1,179	-1.3%	1,483,528	-20,006	-1.3%	-14,177	-1.0%

contd...

...contd...

	Total Output (2003 Rs. Mln.)	*Exports to EU & US, annualized from Feb-Apr 2008 (2003 Rs. Mln.)*	*Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rs. Mln.)*	*% Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rs. Mln.)*	*Total Employment (FTE)*	*Pred. Total Employment Change (FTE)*	*Pred. % Total Employment Change (FTE)*	*Pred. Type 1 Employment Change (FTE)*	*Pred. % Type 1 Employment Change (FTE)*
Rubber and plastic products, petroleum products, coal tar products	2,447,632	115,410	2,461	2.1%	788,369	-6,388	-0.8%	-2,890	-0.4%
Chemicals	2,180,748	261,578	11,050	4.2%	1,706,108	-8,897	-0.5%	-1,370	-0.1%
Other non-metallic mineral products, cement	590,888	32,151	-5,604	-17.4%	3,805,059	-42,300	-1.1%	-37,629	-1.0%
Iron & steel, non-ferrous basic metals	1,915,431	151,205	-29,419	-19.5%	1,631,677	-63,788	-3.9%	-60,586	-3.7%
Metal products	408,534	56,861	-9,757	-17.2%	1,546,798	-47,383	-3.1%	-42,426	-2.7%
Other non-electric machinery	818,287	127,987	-35,004	-27.3%	1,133,599	-36,058	-3.2%	-34,357	-3.0%
Electrical appliances, communication equipments, electronic equipments (incl.TV), other electrical Machinery	896,565	94,843	-16,534	-17.4%	1,890,295	-32,111	-1.7%	-28,873	-1.5%
Rail equipments, other transport equipments	1,013,638	66,833	8,018	12.0%	3,274,241	11,799	0.4%	18,961	0.6%
Misc. manufacturing	823,166	306,434	-93,882	-30.6%	3,051,896	-238,758	-7.8%	-231,435	-7.6%
Construction	3,840,870	0	0	0.0%	22,325,425	-20,248	-0.1%	-8,404	0.0%
Electricity, gas	1,350,123	0	0	0.0%	898,739	-12,142	-1.4%	-7,770	-0.9%
Water supply	96,007	0	0	0.0%	186,421	-799	-0.4%	-317	-0.2%
Railway transport services	425,627	0	0	0.0%	948,540	-11,986	-1.3%	-8,029	-0.8%

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	Total Output (2003 Rs. Mln.)	*Exports to EU & US, annualized from Feb-Apr 2008 (2003 Rs. Mln.)*	*Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rs. Mln.)*	*% Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rs. Mln.)*	*Total Employ-ment (FTE)*	*Pred. Total Employ-ment Change (FTE)*	*Pred. % Total Employment Change (FTE)*	*Pred. Type 1 Employ-ment Change (FTE)*	*Pred. % Type 1 Employ-ment Change (FTE)*
Other transport services	3,358,110	0	0	0.0%	12,850,267	-106,799	-0.8%	-35,733	-0.3%
Storage and warehousing	25,393	0	0	0.0%	82,802	-773	-0.9%	-356	-0.4%
Communication	581,501	0	0	0.0%	1,616,377	-13,975	-0.9%	-4,388	-0.3%
Trade	4,283,034	0	0	0.0%	31,361,699	-296,058	-0.9%	-136,371	-0.4%
Hotels and restaurants	793,180	0	0	0.0%	4,930,116	-34,984	-0.7%	-2,133	0.0%
Banking	1,826,516	0	0	0.0%	1,975,962	-22,629	-1.1%	-11,996	-0.6%
Insurance	382,388	0	0	0.0%	515,730	-4,654	-0.9%	-1,867	-0.4%
Education and research	1,398,150	0	0	0.0%	9,826,241	-45,613	-0.5%	-48	0.0%
Medical and health	1,001,030	0	0	0.0%	3,077,439	-20,292	-0.7%	-153	0.0%
Other services	1,575,355	0	0	0.0%	13,632,895	-101,109	-0.7%	-33,726	-0.2%
Tradable	24,500,070	1,980,674	-229,482	-11.6%	254,516,900	-3,252,070	-1.3%	-1,628,284	-0.6%
Non-tradable	20,937,285	0	0	0.0%	104,228,653	-692,061	-0.7%	-251,292	-0.2%
Total	45,437,355	1,980,674	-229,482	-11.6%	358745553	-3,944,131	-1.1%	-1,879,576	-0.5%

Source: Kucera *et al.* (2010).

Annex 5

Detailed results of the modelling exercise for South Africa

	Total Output (2003 Rand *Mln.)*	*Exports to EU & US, annualized from Feb-Apr 2008 (2003 Rand Mln.)*	*Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rand Mln.)*	*% Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rand Mln.)*	*Total Employ-ment (FTE)*	*Pred. Total Employ-ment Change (FTE)*	*Pred. % Total Employment Change (FTE)*	*Pred. Type 1 Employ-ment Change (FTE)*	*Pred. % Type 1 Employ-ment Change (FTE)*
Agriculture, hunting, forestry and fishing	53,402	8,099	434	5.4%	2,075,212	-241,038	-11.6%	-145,054	-7.0%
Coal mining	20,176	9,418	760	8.1%	74,536	-3,004	-4.0%	-1,820	-2.4%
Gold mining, other mining	82,403	6,604	-1,973	-29.9%	529,111	-7,893	-1.5%	-4,996	-0.9%
Food processing	67,744	2,001	401	20.0%	220,884	-14,088	-6.4%	-1,643	-0.7%
Beverage / tobacco	28,326	3,399	905	26.6%	73,246	-4,764	-6.5%	-534	-0.7%
Textiles	12,533	789	-125	-15.9%	90,412	-3,817	-4.2%	-751	-0.8%
Clothing	8,773	355	-77	-21.7%	227,049	-10,447	-4.6%	-1,429	-0.6%
Leather products	2,409	466	-80	-17.3%	15,163	-273	-1.8%	92	0.6%
Footwear	2,799	14	0	2.4%	33,257	-2,093	-6.3%	-691	-2.1%
Wood products	10,382	244	-41	-16.7%	91,138	-128,919	-141.5%	-127,385	-139.8%
Paper products	25,105	1,641	187	11.4%	31,395	-4,102	-13.1%	-3,220	-10.3%
Printing / publishing	13,257	42	2	4.2%	65,224	-23,126	-35.5%	-20,956	-32.1%
Petroleum products	36,038	848	-204	-24.1%	24,058	-1,249	-5.2%	-476	-2.0%
Chemicals, other chemicals	61,300	5,937	69	1.2%	58,184	-3,367	-5.8%	-1,753	-3.0%
Rubber products, plastic products	16,150	988	-109	-11.1%	59,933	-3,181	-5.3%	-1,586	-2.6%
Glass products	2,523	253	47	18.5%	16,972	-10,342	-60.9%	-9,884	-58.2%
Non-metal minerals	12,479	265	-154	-58.0%	78,989	-1,497	-1.9%	-719	-0.9%

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	Total Output (2003 Rand Mln.)	Exports to EU & US, annualized from Feb-Apr 2008 (2003 Rand Mln.)	Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rand Mln.)	% Change in exports to EU & US, annualized Feb-Apr 2009 vs 2008 (2003 Rand Mln.)	Total Employ-ment (FTE)	Pred. Total Employ-ment Change (FTE)	Pred. % Total Employment Change (FTE)	Pred. Type 1 Employ-ment Change (FTE)	Pred. % Type 1 Employ-ment Change (FTE)
Iron and steel, non-ferrous metals	57,856	37,510	-15,079	-40.2%	94,792	-7,630	-8.0%	-6,816	-7.2%
Metal products	26,758	1,078	-381	-35.3%	139,919	-41,403	-29.6%	-39,654	-28.3%
Machinery	22,758	15,504	-5,657	-36.5%	58,503	-1,827	-3.1%	-1,129	-1.9%
Electrical machinery	14,280	764	-220	-28.8%	45,232	-971	-2.1%	-425	-0.9%
Comm. equipment	5,228	1,787	-282	-15.8%	8,717	-140	-1.6%	-32	-0.4%
Scientific equipment	1,725	703	-110	-15.7%	5,820	-171	-2.9%	-29	-0.5%
Vehicles	57,897	17,579	-2,034	-11.6%	74,844	-2,342	-3.1%	-931	-1.2%
Transport equipment	3,967	802	-106	-13.3%	4,522	-68	-1.5%	-22	-0.5%
Furniture	6,880	2,056	-848	-41.3%	34,387	-1,326	-3.9%	-307	-0.9%
Other manufacturing	6,609	23,520	-9,128	-38.8%	38,433	-1,348	-3.5%	-377	-1.0%
Electricity, gas and water	41,366	0	0	0.0%	94,013	-3,958	-4.2%	-954	-1.0%
Construction	75,856	0	0	0.0%	692,124	4,121	0.6%	6,776	1.0%
Trade services, hotels and catering	187,309	0	0	0.0%	2,376,767	-176,370	-7.4%	-98,207	-4.1%
Transport and communication services	144,770	0	0	0.0%	585,062	-22,334	-3.8%	-7,208	-1.2%
Financial and business services	247,025	0	0	0.0%	988,649	-39,730	-4.0%	-9,100	-0.9%
Other services	31,250	0	0	0.0%	573,466	-25,738	-4.5%	-2,835	-0.5%
Other producers	48,613	0	0	0.0%	2,181,860	-101,433	-4.6%	-26,990	-1.2%
Government services	181,030	0	0	0.0%	541,169	-618	-0.1%	-275	-0.1%

Source: Kucera *et al.* (2010).

Annex 6

Description of the STAGE_LAB model and SAM used for the Brazil study[3]

The STAGE_LAB computable general equilibrium (CGE) model (McDonald and Thierfelder, 2009)[4] is a development of the STAGE model (McDonald, 2007) that provides a richer treatment of factor markets. The model has several distinctive features. First, the model allows for a generalized treatment of trade relationships by incorporating provisions for non-traded exports and imports. Second, the model allows the relaxation of the small country assumption for exported commodities. Third, the model includes provision for multiple product activities. Fourth, (value added) production technologies are specified as a generalized system of nested CES functions, which permits the endogenous modelling of unemployment for all factors and the ability for factors to migrate between regions/areas and/or factor "classification"; for example, between semi-skilled and unskilled labour. And fifth, household consumption expenditure is modelled using Stone-Geary utility functions. The model is a social accounting matrix (SAM)-based CGE model, wherein the SAM serves to identify the agents in the economy and provides the database with which the model is calibrated.

Behavioural relationships

Households are assumed to choose the bundles of commodities they consume so as to maximize utility where the utility function is Stone-Geary. The households choose their consumption bundles from a set of "composite" commodities that are aggregates of domestically produced and imported commodities. These composite commodities are formed as constant elasticity of substitution (CES) aggregates, which embody the presumption that domestically produced and imported commodities are imperfect substitutes. The optimal ratios of imported and domestic commodities are determined by the relative prices of the imported and domestic commodities. This is the so-called "Armington insight" (Armington, 1969), which has the advantage of rendering the model practical by avoiding the extreme specialization and price fluctuations associated with other trade assumptions. In this model, the country is assumed to be a price taker for all imported commodities.

Domestic production uses a multi-stage production process (see below). The vector of commodities demanded is determined by the domestic demand for domestically produced commodities and export demand for domestically produced commodities. Using the assumption of imperfect transformation between domestic demand and export demand, in the form of a constant elasticity of transformation (CET) function, the optimal distribution of domestically produced commodities

between the domestic and export markets is determined by the relative prices on the alternative markets. The model can be specified as a small country, i.e., price taker, on all export markets, or selected export commodities can be deemed to face downward sloping export demand functions, i.e., a large country assumption.

The other behavioural relationships in the model are generally linear. A few features do, however, justify mention. First, all the tax rates are declared as variables that can adjust endogeneously to satisfy fiscal policy constraints. Similar adjustment mechanisms are available for a number of key parameters; for example, household and enterprise savings rates and inter-institutional transfers. Second, technology changes can be introduced through changes in the activity specific efficiency variables—adjustment and/or scaling factors are also available for the efficiency parameters. Third, the proportions of current expenditure on commodities defined to constitute subsistence consumption can be varied. And fourth, the model is set up with a range of flexible macroeconomic closure rules and market clearing conditions. While the base model has a standard neoclassical model closure (for example, full employment, savings driven investment and a floating exchange rate), these closure conditions can all be readily altered.

Price and quantity relationships

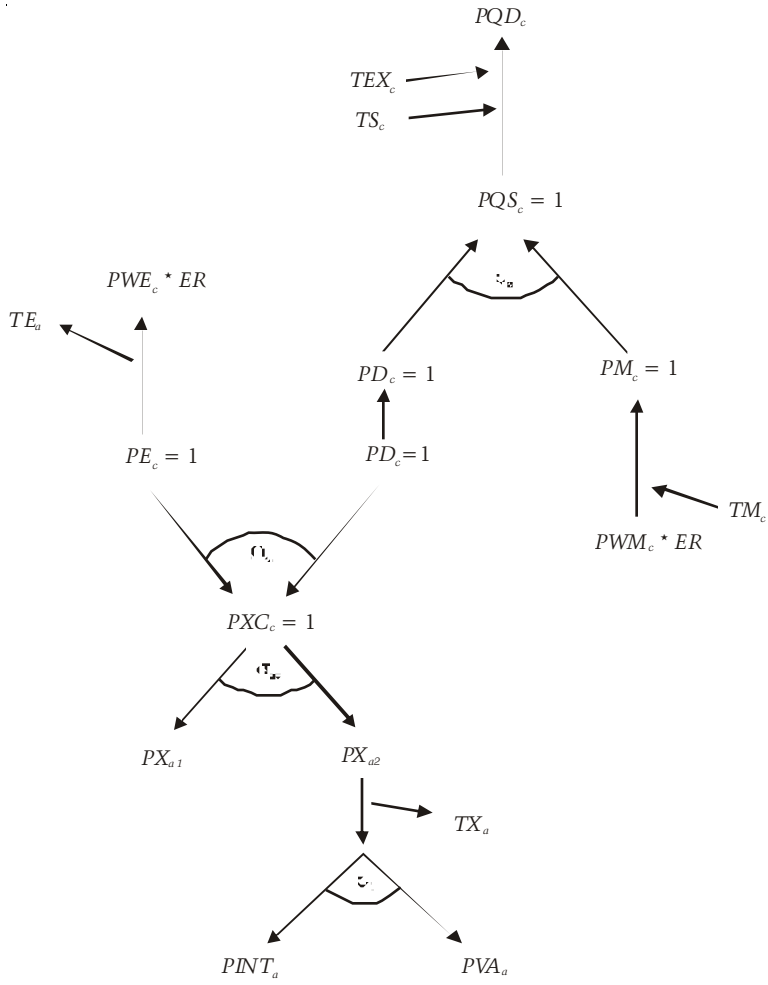
Figures 1 and 2 provide detail on the interrelationships between the prices and quantities for commodities and activities. The supply prices of the composite commodities (*PQSc*) are defined as the weighted averages of the domestically produced commodities that are consumed domestically (*PDc*) and the domestic prices of imported commodities (*PMc*), which are defined as the products of the world prices of commodities (*PWMc*) and the exchange rate (*ER*) uplifted by ad valorem import duties (*TMc*). These weights are updated in the model through first-order conditions for optima. The average prices exclude sales taxes, and hence must be uplifted by (ad valorem) sales taxes (*TSc*) and excise taxes (*TEXc*) to reflect the composite consumer price (*PQDc*).[5] The producer prices of commodities (*PXCc*) are similarly defined as the weighted averages of the prices received for domestically produced commodities sold on domestic and export (*PEc*) markets. These weights are updated in the model through first-order conditions for optima. The prices received on the export market are defined as the products of the world price of exports (*PWEc*) and the exchange rate (*ER*) less any exports duties due, which are defined by ad valorem export duty rates (*TEc*).

The average price per unit of output received by an activity (*PXa*) is defined as the weighted average of the domestic producer prices, where the weights are constant. After paying indirect/production/output taxes (*TXa*), this is divided between payments to aggregate value added (*PVAa*), i.e., the amount available to pay

primary inputs, and aggregate intermediate inputs (*PINTa*). Total payments for intermediate inputs per unit of aggregate intermediate input are defined as the weighted sums of the prices of the inputs (*PQDc*).

Figure 1

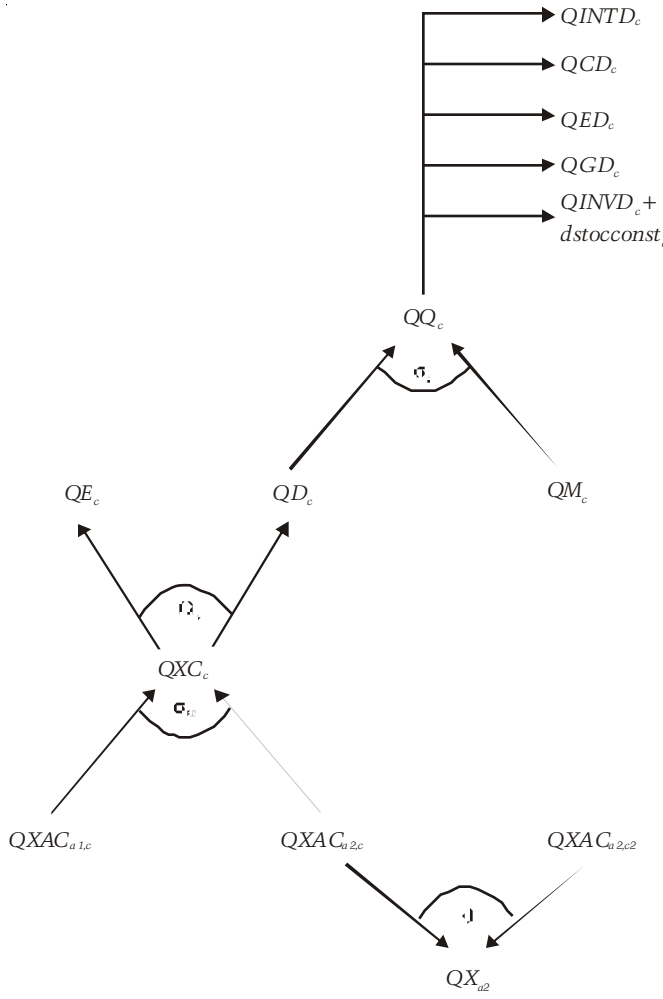
Price relationships for the STAGE_LAB model



Total demands for the composite commodities, *QQc*, consist of demands for intermediate inputs, *QINTDc*, consumption by households, *QCDc*, enterprises, *QEDc*, and government, *QGDc*, gross fixed capital formation, *QINVDc*, and stock changes, dstocconstc. Equilibrium conditions ensure that the total supplies and demands for all composite commodities equate. Total supplies are constant elasticity of substitution (CES) aggregates of supplies from domestic producers, *QDc*, plus imports, *QMc*, with σ_C as the elasticity of substitution. Commodities are

Figure 2

Quantity relationships for the STAGE_LAB model

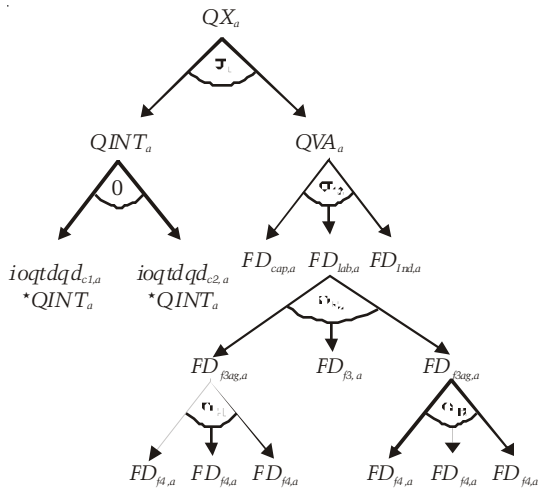


delivered to both the domestic and export, *QEc*, markets subject to equilibrium conditions that require all domestic commodity production, *QXCc*, to be either domestically consumed or exported. QXCc is a constant elasticity of transformation (CET) aggregate of exports and supplies from domestic producers with Ω_C as the elasticity of transformation.

The presence of multi-product activities means that domestically produced commodities can come from multiple activities, i.e., the total production of a commodity is defined as the sum of the amount of that commodity produced by each activity. Hence, the domestic production of a commodity (*QXC*) is a CES aggregate of the quantities of that commodity produced by a number of different activities (*QXAC*), which are produced by each activity in activity-specific fixed proportions, i.e., the output of *QXAC* is a Leontief (fixed proportions) aggregate of the output of each activity (*QX*).

Figure 3

Production relationships for the STAGE_LAB model: Quantities



Production relationships by activities are defined by a series of nested CES production functions.[6] Mathematically, the limit on the number of levels of nests is only constrained by the number of different factor types included in the database. However, there are additional limits imposed by economic meaningfulness and the availability of empirical data that allow for the inclusion of information (elasticities of substitution) about the possibilities for substitution between and within subgroups of factors. The illustration in Figure 3 is for a four-level production nest, in quantity terms; to simplify exposition, two intermediate inputs, nine natural/

actual primary inputs and three aggregate primary inputs are identified, and only the labour accounts are nested beyond the second level.

Activity output is a CES aggregate of the quantities of aggregate intermediate inputs (*QINT*) and value added (*QVA*). Aggregate intermediate inputs are a Leontief aggregate of the (individual) intermediate inputs, and aggregate value added is a CES aggregate of the quantities of "primary" inputs demanded by each activity (*FD*), where the primary inputs can be natural factors—types of labour, capital and land that exist—and aggregate factors, which are aggregates of natural factors and/or other aggregate factors. Any factor at the end of any branch in Figure 3 is by definition a natural factor, i.e., it is not an aggregate. Thus all the factors $FD_{f4,a}$ are natural factors, as are $FD_{f3,a}$, $FD_{cap,a}$ and $FD_{lnd,a}$, whereas all $FD_{f3ag,a}$ and $FD_{lab,a}$ are aggregates. In the model, the set *ff* is defined as the set of all natural factors and aggregates, while the set *f*, a subset of *ff*, is defined as the set of all natural factors; other subsets of *ff* define the level of each factor—natural or aggregate—in the nesting structure.

Starting from the bottom of the value added nests in Figure 3: the six types of natural labour (*f4*) form two groups of labour that can be substituted within the subgroup to form two aggregates ($FD_{f3ag,a}$). These two aggregates, along with another natural factor ($FD_{f3,a}$), are also substitutes that form an aggregate labour factor ($FD_{lab,a}$), which combines with the natural factors of capital ($FD_{cap,a}$) and land ($FD_{lnd,a}$) to generate aggregate value added (*QVA*). The optimal combinations of each natural and/or aggregate in each CES aggregate are determined by first-order conditions based on relative prices.

The advantage of using such a nesting structure is that it avoids making the assumption that all natural factors are equally substitutable in the generation of value added. In the case illustrated by Figure 3, the implicit presumption is that different types of labour are not equally substitutable, but that aggregate labour, capital and land are equally substitutable. For instance, the level 3 labour aggregates, $FD_{f3ag,a}$, may be defined as the aggregate labour employed by an activity class in a specific region, which is made up of three types of labour that have different sets of skills—skilled, semi-skilled and unskilled—but can only be employed in the specific region. However, the activity class may choose to "substitute" labour from different regions by altering the balance between production taking place in different regions.

This highlights an important consideration. The adoption of a nesting structure carries with it the presumption that factor markets are segmented, i.e., while unskilled labour from a region can be part of that region's aggregate labour factor, unskilled labour from another region cannot. Implicit to this structure therefore is the presumption that labour cannot migrate between regions, whereas

in reality there is strong evidence that people are prepared to migrate in search of improved employment opportunities. To address this consideration, STAGE_LAB includes a series of migration functions that allow net migration of factors of production between the sub-nests of the production structure; for example, unskilled labour can migrate between different regions in response to employment opportunities. The incentives to migrate are determined by the changes in the relative wages received by the factors in different sub-nests.

The model includes a constant elasticity supply function for each factor type. If the relative wage of the factor in a sub-nest increases or decreases, the supply of that factor to a sub-nest can increase or decrease subject to the condition that the total supply of that factor type in the economy is fixed: the resultant migrations represent a partial adjustment in response to changes in relative wages. When combined with the constraints for labour market clearing they ensure no increases in labour supply. The degrees of mobility are controlled by the supply elasticities, which can vary for each and every factor; for example, unskilled labour in one region may be more or less mobile than unskilled labour in other regions. In practice, this version of the model operates a pooling system; the labour supply functions either as supply or demand to or from a series of pools, rather than as bilateral migration between sub-nests; thus only net migration is modelled. Full bilateral tracking of labour migration could be readily achieved, but would require the imposition of many more supply elasticities, for which there is limited information.[7] The choice of the pooling mechanism is accordingly driven by the decision to achieve a balance between detail and the imposition of exogeneous information that has limited empirical basis.

The operation of the migration functions requires the specification of which types of labour can be supplied from a specific pool. This requires the association of factors with particular pools, and it is important to ensure these associations are meaningful. In the regionalized examples given above it is clearly potentially valid to assume that labour of the same skill types employed in different regions might be able to move between regions. Furthermore, it may be reasonable to argue that there may be some migration between skill types within a region, such as between semi-skilled and unskilled labour, although the ease of migration may depend upon the direction—semi-skilled may be easily able to become unskilled, but unskilled may be much less easily transformed into semi-skilled. But other migrations may not be appropriate.

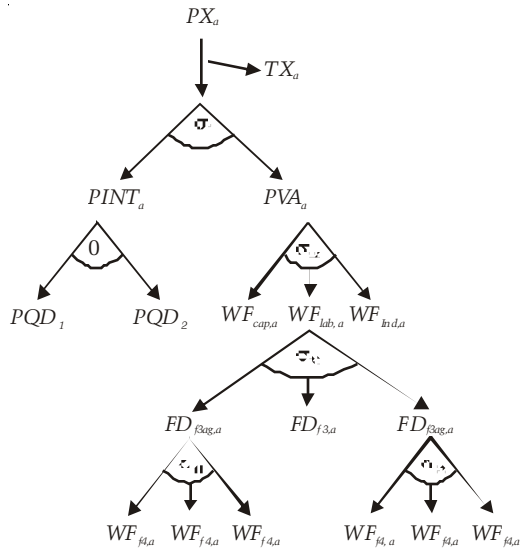
Consider a scenario where there is discrimination in labour market on the basis of some readily observable characteristics—such as race, gender or religion—and labour in a skill class is subdivided according to the characteristics used in discrimination. In such a scenario, migration between sub-nests is clearly not straightforward since the characteristics used in discrimination cannot be

transformed. Consequently, care needs to be exercised when defining the possible channels for migration.

Until now it has been assumed that labour supplies are fixed. However, STAGE_LAB allows for the possibility of unemployment for each and every natural factor. This is achieved by defining the supply of each factor by reference to current total demand plus the stock of the factor currently unemployed. In the case of labour, if there is current unemployment for a class of labour (for example, unskilled), the real wage of that class is fixed until all the stock of unemployed unskilled workers has been absorbed by the labour market; thereafter, the real wage of the factor is flexible.[8] This form of regime switching is attractive as it increases the realism with which the labour markets are modelled, but it does have some implications for the modelling of labour migration. Given that labour migration decisions depend on changes in relative wage rates, there can only be net migration when a factor within a migration pool is fully employed, as only then can relative wages change.

Figure 4

Production relationships for the STAGE_LAB model: Prices



The price relations for the production system are illustrated in Figure 4. Note how the prices paid for intermediate inputs (PQD) are the same as prices paid for final demands, i.e., one price relationship holds across all domestic demand. Note also that factor prices are factor and activity specific ($WF_{ff,a}$), which means that the

allocation of finite supplies of factors (*FS*) between competing activities depends upon relative factor prices via first-order conditions for optima.

These extensions to the representation of the labour market increase the degree of realism achieved in the modelling of labour market transactions. One dimension of this increased realism is that the model reduces the degree of factor market response to changes in prices. This is achieved in several ways: first, the nested structure reduces the extent of substitution possibilities; second, the ease of substitution between factors is damped down by the nested structure; and third, the migration functions further reduce substitution possibilities through the partial adjustment to changes in wage rates.

Social accounting matrix

A social accounting matrix (SAM) is an assemblage of data that reports all the economic transactions (flows of receipts and expenditures) incurred by all the agents in the economy for a particular year. These agents are the production sectors, social groups (households), firms, government and foreign agents. These flows take place due to commodity transactions (buying and selling) between the agents for purposes of consumption, intermediate use, investment and the likes, and by way of inter-agent transfers.

The SAM used in this study was constructed by Joaquim Bento de Souza Ferreira Filho. It improves upon earlier SAMs for the Brazilian economy by updating the economic data to the year 2004. Another characteristic of this SAM is the degree of regional detail, with information for the 27 regions within Brazil (26 states plus the Federal District). It also provides a disaggregated representation of labour and households, with 10 different labour types and 10 different household groups. For the purposes of this study, the SAM was reduced by aggregation to seven regions with 42 commodity accounts, 45 activities, 7 (region-specific) types of land, 7 (region-specific) types of capital, 35 types of labour (5 different skill types by 7 different regions) and 7 (region-specific) households, together with a series of other institutional accounts and multiple tax instruments.[9]

Notes

1 This section is from Kucera *et al*. (2010).

2 Because the SAMs for India and South Africa provide separate commodity and production accounts, ***T*** enters through the commodity account and impacts on the domestic economy (i.e., domestic incomes and employment) through the production account.

3 This section is from McDonald *et al*. (2010).

4 The STAGE model is a member of the class of single-country computable general equilibrium (CGE) models that are descendants of the approach to CGE modelling described by Dervis *et al*. (1982).

5 For simplicity, only one tax on domestic commodity sales is included in Figure 1.

6 Perroni and Rutherford (1995) demonstrate that nested CES functions can approximate any flexible functional form, e.g. translog.

7 It could be argued that migration between regions that are "geographically" close would be greater than between regions that are far apart. However, it is also possible that there will be a series of migration decisions whereby labour simultaneously enters and leaves the same region.

8 In terms of the model, this requires that the model operates with one regime when there is unemployment and another regime when there is full employment. This regime switching is achieved by specifying the model as a mixed complementarity problem. The variant used here generates a two-segment labour supply function—horizontal until full employment and then vertical. More complex options are possible, e.g., three segments—horizontal until unemployment rate falls below some level, upward sloping until full employment and thereafter vertical.

9 There are four taxes on commodities, two on activities, income taxes on households and enterprises and factor-specific use taxes that vary by the employing activity. Not all the tax instruments are active in the base data.

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