Knowing, When You Do Not Know

SIMULATING THE POVERTY AND DISTRIBUTIONAL IMPACTS OF AN ECONOMIC CRISIS

Ambar Narayan and Carolina Sánchez-Páramo

Editors

A WORLD BANK STUDY
Knowing, When You Do Not Know

Simulating the Poverty and Distributional Impacts of an Economic Crisis

Edited by
Ambar Narayan and Carolina Sánchez-Páramo
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Foreword

Economists have long sought to predict how macroeconomic shocks will affect individual welfare. Macroeconomic data and forecasts are easily available when crises strike. But policy action requires not only understanding the magnitude of a macro shock, but also identifying which households or individuals are being hurt by (or benefit from) the crisis. Moreover, in many cases, impacts on the ground might be already occurring as macro developments become known, while micro level evidence is still unavailable because of paucity of data. Because of these reasons, a comprehensive real-time understanding of how the aggregate changes will translate to impacts at the micro level remains elusive. This problem is particularly acute when dealing with developing countries where household data is sporadic or out of date.

A popular solution is to extrapolate the welfare impact of a shock from the historical response of income or consumption poverty to changes in output, by estimating an “elasticity” of poverty to growth. Although this method provides an estimate for the aggregate poverty impact of a macro shock, it has limited value for analysts and policy makers alike. Aggregate numbers are useful to capture the attention of policy makers and the international community, but in the absence of any information on who is affected and to what extent, provide little guidance on what actions need to be taken. To take one example, most targeted anti-poverty programs focus on the existing poor. But when a crisis occurs, any efforts to expand or retool existing programs would require finding out who is likely to become poor and how much more deprivation is likely to occur among the existing poor as a result of the shock. Moreover, the specific characteristics of an output shock, whether it is caused, for example, by a natural disaster, a reduction of external demand, or internal macroeconomic mismanagement, may lead to very different impacts along the income scale that demand different policy responses.

This volume outlines a more comprehensive approach to the problem, showcasing a microsimulation model, developed in response to demand from World Bank staff working in countries and country governments in the wake of the global financial crisis of 2008-09. During the growing catastrophe in a few industrialized countries, there was rising concern about how the crisis would affect the developing world and how to respond to it through public policies. World Bank staffs were scrambling to help countries design such policies; this in turn required information on which groups of the population, sectors and regions the crisis would likely affect and to what extent.

The problem was exacerbated by the fact that the 2008-09 crisis was somewhat unique. Unlike many other recent episodes of economic crisis, it did not originate in the developing world and did not involve high levels of inflation. There was also no consensus on who would be affected, partly because the anatomy of the crisis in each country would have depended on the nature of the economy, the extent of “exposure” to the global turmoil and the extent of integration with the developed world. Would the middle class bear the brunt of the downturn? How much would the impacts differ across countries, in terms of who are affected? Without good high-frequency micro-level data, as is the case in most developing countries, the answers to these questions had to rely on simulations that link macro projections with pre-crisis household data. Using simple
extrapolations from a historical series of income and poverty was not enough. On the other hand, devising a comprehensive macro-micro simulation model, linking pre-crisis household data with Computable General Equilibrium (CGE) models was impractical for most countries given that such models are hard to find and calibrate within the limited time available to analysts. Rather, filling this void required finding the fine balance between two competing needs: capturing the complexities that influence how macro impacts are transmitted to the households and feasibility in terms of time, cost, and data requirements.

The void was at least partially filled by the approach developed by staff from the Poverty Reduction & Equity Department of the World Bank, modifying some of the well-known microsimulation models from the economic literature. Starting with the idea of using simple macroeconomic projections as the “macro linkages” to a microbehavioral model built from household data, the model was conceptualized, refined and tested in a diverse mix of countries: Bangladesh, the Philippines, Mexico, Poland, and Mongolia. The results fed into country policy dialogue and lending operations of Bank teams as well as various reports, research papers and briefs.

Although conceived with the financial crisis in mind, the model can be applied to different kinds of macroeconomic shocks—essentially any macro event that leads to a change in real output at the national, sectoral and (subject to data availability) sub-national level for a country. The model has already been used to determine the impacts of typhoons in the Philippines and Dzud (harsh winter) in Mongolia. It can also be a platform to build extensions to simulate the distributional impacts of other types of macro shocks, as long as they share certain common characteristics. For one, since this model was developed in the context of a crisis that manifested primarily in the form of output shocks, it focuses on the labor market as the main transmission channel, which is ideal for analyzing the impacts of certain types of crises but not for others (such as commodity price shocks).

While microsimulation models are powerful analytical tools to assess the impact of macroeconomic shocks, they have important limitations and economists will have to continue to strive to make them more efficient and flexible. At the heart of the problem is the need to strike a delicate balance between expediency and sophistication, while creating a model that is still workable for developing countries with sparse or outdated data, in a context were information is needed in order to take time sensitive policy decisions: Should a safety net program be expanded quickly to urban areas? Should employment subsidies be provided to firms for hiring young workers? Are farmers in need of temporary support through cheaper credit?

An important concern is that of second order impacts. The method hinges on extrapolating the future from structural relationships between demographics, income, and employment, estimated from historical data. As a result, it is unable to account for what could happen as people change their behavior in response to (and cope with) a crisis. This may be less serious a problem than it seems—one can argue that these responses are in fact irrelevant, since the simulations are intended to help institute policies that minimize the need for people to change their behavior in the first place. Even so, it is an issue that merits careful thought.

In order to find solutions to methodological and policy debates, economists need to take advantage of periods of relative calm, rather than having to deal with them in
the midst of a crisis. Ideally, when a macro shock occurs, economists should be ready to respond with adequate analysis of impacts to inform policy measures by governments. The true measure of “success” of these efforts would be whether the predictions influence the governments to put in place the right kind of policies that minimize the suffering of people.

In building such capacity, it is relevant to look ahead to what lies ahead in the immediate future for us at the Bank and the development community in general. Building on the experience gained from employing the model to multiple countries and settings, a user-friendly simulation software is currently being developed by staff from the Poverty Reduction & Equity Group and the Development Research Group, as a new module of the ADePT platform developed by the Bank. Probably the first ever of its kind, this software would greatly enhance the usability of microsimulation to predict the distributional impact of future shocks. At the same time, we see this to be not an end in itself, but rather a foundation to build on for the future. As the model is used more frequently, we expect to see further improvements, refinements, and applications emerging organically from interactions with users, which will continue to improve the quality of analysis the Bank can provide to countries during future crises.

The volume is organized as follows. Chapter 1 summarizes the methodology underlying the microsimulation model to predict distributional impacts of the crisis, along with several case studies that highlight how the model can be used in different country contexts. Chapters 2 to 4 are written by experts external to the Bank, two of whom participated as discussants at a workshop on the microsimulation work organized in May, 2010 at the World Bank headquarters. Chapter 2 comments on the broader implications and shortcomings of applying the technique described in Chapter 1 and the ability or willingness of governments to respond adequately to its results. Chapter 3 draws parallels between the United States and developing countries to discuss the lessons that can be learned for mitigating the impacts of future crises. Chapter 4 discusses how the microsimulation approach can be sharpened to make it a better tool for distributional analysis moving forward.

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CHAPTER 1

Assessing the Poverty and Distributional Impacts of the Financial Crisis with Microsimulations: An Overview of Country Studies

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The financial crisis started in a few industrialized countries in 2008, but soon led to contractions in growth, employment and household income in both developed and developing countries. In many countries in the developing world, the growth contraction led to increased poverty and lower income and non-income welfare. Global estimates by the World Bank suggest that by 2010, the crisis could have resulted in 89 million more people living below US$1.25 a day and 120 million more below US$2 a day, compared to a scenario of uninterrupted economic expansion without the crisis (Chen and Ravallion, 2009). Along with the impact on poverty, the crisis could have also had significant impacts on the distribution of income and consumption within countries.

This chapter summarizes the results and insights from simulation exercises to estimate the poverty and distributional impact of the financial crisis in selected developing countries.1 These simulations are based on approaches suggested in economic literature, notably Bourguignon et al. (2008) and Ferreira et al. (2008). The four countries studied here—Bangladesh, Mexico, the Philippines, and Poland—belong to different regions of the world, and they are also characterized by vast differences in terms of per capita income and other development characteristics, economic conditions prior to the crisis, and the extent and nature of impact of the crisis.2 These countries all lack real-time data to measure the welfare impacts of the crisis, which necessitated simulations to estimate these impacts.

The report has two distinct objectives. The first is to illustrate the kind of welfare impact that the crisis is likely to have had, depending on a range of country-specific factors including the size of the aggregate shock and the channels through which impacts are transmitted. While four disparate case studies cannot represent the developing world, the insights they provide can serve as guides to the potential impacts of future macro-
economic shocks. The second objective is to highlight the methodological techniques and innovations needed for a simulation approach that can provide analytically sound and policy-relevant insights for a developing country in the absence of real-time micro-level data or complex general equilibrium models. We hope that this report and its supporting country case studies will provide a methodological road map, with its potential uses and caveats clearly spelled out, for those analyzing countries affected by similar shocks in the future, especially when they are confronted with data and time constraints similar to those faced here.

The report also draws upon results obtained from other simulation exercises conducted by Bank teams in the context of the financial crisis (see Aran et al., 2010). These simulations were undertaken by Bank teams that needed to come up with the best analytical findings possible, facing data constraints similar to ours. The report does not discuss the results of these exercises in detail, but compares the methodologies adopted and insights obtained with those from our simulations.3

Financial Crisis and Its Impact on Poverty

Estimating the welfare impacts of the financial crisis within developing countries has proved difficult for a number of reasons. The nature of the crisis has shifted rapidly, both across countries through trade, financing (credit and FDI) and remittances, and within them through fiscal policies and adjustments in domestic credit and labor markets. As the contagion spread, it took a different shape within each country, based on the relative importance of each of these factors. Moreover, evidence from previous crises suggests that extrapolations based on historical experience can be imperfect guides to estimating the potential impact of a macroeconomic shock. For example, there is evidence to suggest that the output elasticity of wages tends to be larger during downturns than during booms, and that relative inequality falls about as often as it rises during aggregate contractions (Paci et al., 2008). There is also evidence that the type of macroeconomic shock matters for welfare impacts and the pace of recovery: shocks that originate in the financial markets, for example, are often believed to result in a slower recovery of employment and household incomes.4

That said, there is some consensus on how the impact of the crisis is likely to have spread among different groups in developing countries. The initial impact is thought to have been felt mostly by the emerging middle class in these countries, since they were more likely to be employed in export-oriented industries and salaried jobs in the services sector—parts of the economy that appear to have borne the brunt of the impacts initially.5 Labor markets in the formal sector were affected by declining demand for domestic goods and exports, falling commodity prices and reduced availability of credit for firms. Approximately 90 percent of households entering the middle class during 1990–2005 joined the lower tier of consumption (Ravallion, 2009), and thus risked falling back into poverty as a result of large employment or earnings shocks. On the other hand, the impact on the poor in developing countries is likely to have been limited initially, due to the very isolation from the global markets (and the formal sector) that had prevented them from exiting poverty in the past. But as the contagion spread from the formal to the informal sector through the backward and forward linkages between different parts of the economy, the poor are likely to have been affected as well.
The poor in developing countries could have been impacted by the crisis through a number of channels. Shocks to employment and wages in the formal sector are likely to have pushed more people into the informal sector, which in turn would have depressed earnings and crowded out employment. Shocks to urban manufacturing and services may also have led to reverse migration from urban to rural areas, increasing the burden on poor rural households and drying up remittances from workers previously employed in the formal sector. Given that these dynamics would have occurred in country contexts where governments were in fiscal stress due to falling revenues—and therefore had little room to react with appropriate policy measures—the effects could have been deep and long lasting.6

**Evaluating the Impact of the Crisis**

As the discussion so far highlights, the impact of the crisis on income distribution and poverty within each country is likely to have been complex and dynamic. Given these complexities, an analysis of the impacts must, at a minimum, address the following issues: (i) which sectors, areas and/or regions are most likely to be impacted and in what way; (ii) how sectoral and regional impacts translate into impacts across the income or consumption distribution; (iii) what are the characteristics of those who will become poor as a result of the crisis; and (iv) what are the implications of how these impacts are distributed for the design of policy responses, particularly those that seek to provide safety nets to the affected.

Moreover, in order to usefully inform policy responses to the crisis, the above questions would have to be analyzed ex ante, without the benefit of micro data that capture actual impacts. In developing countries, real-time data from the crisis period is rarely available. Thus in most cases impacts must be estimated based on data that predate the crisis, rather than delaying the analysis until post- or during-crisis data becomes available—usually too late to inform policy measures that governments need to respond with during a crisis. Even in countries where some real-time data is available from crisis-affected sectors or regions, an ex ante approach using historical data can be useful to simulate future impacts for hypothetical scenarios that are not available from real-time data—for example, to compare different alternative scenarios that may unfold in the future. This is especially true for countries where the situation is changing rapidly, as was the case for many countries when the financial crisis almost overlapped with the food and fuel price crisis of 2008.

Finally, the method for assessing poverty and distributional impacts of a crisis must be able to account for multiple channels through which the impacts can be transmitted to households and individuals, and identify the relative importance of these channels in a given country context. It must do so at the individual and household levels over the entire income/consumption distribution.

A number of different approaches have been used in the economic literature and by development institutions, including the World Bank, to estimate ex ante the impact of a crisis on household incomes and poverty. A commonly used approach involves estimating an output elasticity of poverty, in which historical trends of output and poverty are used to determine the responsiveness of poverty rates to growth in output, which is then combined with macroeconomic projections to estimate the impacts of reduction in
future growth on poverty. Although this method is easy to apply, it only provides aggregate poverty (or at most, sectoral or regional) impacts and very little information on how the impacts are likely to be distributed among different groups or sub-populations, which is critical for policy design. Other approaches, used in a few middle-income countries, involve using microsimulation methods that combine computable general equilibrium (CGE) models with the predictions from behavioral regressions built on pre-crisis household data to simulate household-level impacts across the entire income/consumption distribution.7

The approach adopted here is best seen as a compromise between “aggregate” approaches that rely on growth-poverty elasticities and complex macro-micro simulation approaches that harness the power of general equilibrium models and household data. The compromise involves combining the behavioral estimations from pre-crisis household data with aggregated macroeconomic projections. This leads to a model that is leaner than the typical macro-micro simulation models, takes less time to compute, and above all is applicable in countries where CGE models are either unavailable, outdated or of poor quality. In contrast to CGE models, aggregate macroeconomic projections—such as those for national, sectoral, or regional GDP and remittance flows—are available for most countries with which the Bank and/or the International Monetary Fund (IMF) has an ongoing dialogue. Compared to the simple elasticity-based approach outlined above, this approach has the main advantage of being able to generate estimates for individuals and households all along the distribution with and without the crisis, which can be used for detailed poverty and distributional impact analyses. Aran et al. (2010) use an approach that is broadly similar with ours, in terms of combining simulations with household data and macro projections, while differing in how household behavior is modeled and linked to macro projections.

The Methodology to Estimate Impacts Ex Ante8

The approach adopted here involves superimposing macroeconomic projections on behavioral models built on pre-crisis micro data. The model is based on the approaches described in Bourguignon et al. (2008) and Ferreira et al. (2008)—with the important simplification of omitting the CGE component. Instead, the behavioral models are linked to aggregate and sector-level macroeconomic projections for a specific country and year, and the micro-level (individual and household) snapshot of future impacts is extrapolated from these projections.

The model focuses on labor markets and (international) remittances as the main channels through which the macro-level shocks impact individuals and households. It allows for shocks (negative or positive) to labor income—modeled as employment shock, earnings shock or a combination of both—and shocks to non-labor income from changes in remittance flows. Most of the changes in total income are captured, since labor income and remittances account for a significant proportion of household income in most developing countries. Reasonable assumptions are made about impacts on other sources of income, such as capital income, domestic remittances, rents, or public transfers. These assumptions can reflect specific information about impacts on these sources of household income, depending on what information is available for a certain country.
How the Approach Works

Using pre-crisis micro data and macro projections for the crisis period, income distributions can be predicted at the individual and household levels for each year for which macroeconomic projections are available. The data requirements are fairly straightforward. At the macro level, projections are needed on: (i) output and employment by sector and remittances, (ii) population growth, and (iii) predicted price changes. At the micro level, a household survey is essential, with information on: (i) household income and consumption, (ii) household and individual characteristics, and (iii) individual-level labor force and employment status and earnings.

Macroeconomic projections for outputs (sectoral and national) are almost always available, while employment projections are usually unavailable. Thus an important initial step in the simulation exercise is to translate output growth estimates into employment changes at the sector level, for a specific crisis year and macroeconomic scenario. This is typically done using sectoral output-employment elasticities (estimated from historical data), which can then be applied to the output growth projections to generate changes in employment by sector. In Mexico, for example, the elasticities for 2010–11 are estimated using information on sectoral GDP and employment changes during 2003–09 and applying a simple correlation model between both series.

Once the employment projections are generated, the simulation process is accomplished in three main steps (Figure 1.1). The first step consists of using household data for the latest available pre-crisis year to estimate behavioral models on employment status (whether an individual is employed or not, and the sector of employment) and earnings for individuals, as a function of their individual and household characteristics.9

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**Figure 1.1: Scheme of the modeling process**

**Baseline (Calibration)**
- Input: Micro data
- Output: LF status model, Earnings equation, Migration/remittances
- Rule: Best fit to micro data

**Simulation**
- Input: Macro projections
- Output: \( \Delta \) in LF status (ind), \( \Delta \) real earnings (ind), \( \Delta \) remittances (HH), Population growth
- Rule: Replicate macro proportional changes at micro level

**Assessment of impacts**
- Input: Price data
- Output: Income and consumption (individuals and HH), Poverty and inequality measures
- Rule: Adjust

The second step consists of replicating the macro-level changes in output and employment (actual or projected) between baseline and crisis years on the household data of the baseline year. This process uses predictions of behavioral models estimated on the pre-crisis household data (as in step 1 above) and generates household and individual-level predictions for employment, earnings and remittances for specific crisis years and macroeconomic scenarios. Since an individual’s labor income depends on his/her employment status and labor earnings, how the output shock in a particular sector is apportioned between employment shocks, earnings shocks, and adjustments across sectors depends on how responsive (elastic) employment in that sector is to output changes. It also implies that at the household level, the extent of the impact depends on the size of the aggregate shocks at the sector level and the demographics and characteristics of household members, which influence the labor force status and earnings of household members after the shock.

The simulations are also adjusted for population growth, using official population projections (disaggregated by gender and age groups) to fully account for demographic changes that would affect the size and composition of the labor force and, through that, the estimates of per capita household income. This is done by re-weighting households in the baseline data to replicate demographic changes predicted by population projections. To simulate changes in non-labor income, projections of aggregate changes in remittances are linked to pre-crisis remittance information from household data using a simple assignment rule to ensure that the total change in remittances received by households is equal to the projected change in remittances from the macro data. Some components of non-labor income are assumed to grow at the rate of aggregate GDP for the relevant period (profits, rents and domestic remittances), while others are kept constant in real terms at the baseline year level or changed in accordance with specific information received for each country (social benefits, pensions or other transfers, depending on the country).

The steps outlined above yield a projected income distribution corresponding to a specific crisis year and macroeconomic scenario. In the case of Bangladesh, where poverty is defined in terms of consumption, household incomes are transformed into predicted consumption levels using the average propensity to consume for each household from the baseline year. The final step consists in using price projections to adjust the poverty line to reflect the difference in food and non-food inflation rates between baseline and crisis years. Since the poverty line is typically anchored to a food basket that ensures a minimum calorie intake, for countries where food inflation is expected to be significantly different from general inflation between baseline and crisis years, the baseline poverty line would not be enough for a household to meet the basic food requirements in the crisis year. For the countries where food prices are a concern of policy makers (Bangladesh, the Philippines, and Mexico), a small upward adjustment is made to the poverty line to ensure that the same food basket remains affordable. These poverty lines are then compared with predicted household incomes/consumption to generate poverty estimates for each crisis year and scenario.

**Defining the “Impact”: Two Types of Countries**

The impact of the crisis on poverty indices and income distribution can be measured in two ways: a “before-after” comparison of the change in welfare status in a country between pre-crisis and crisis years, and a “with-without” comparison of the difference
between with-crisis and without-crisis scenarios for the same year. It turns out that a certain type of comparison is more meaningful for each country, depending on the nature of macroeconomic impact the country is likely to suffer from the crisis and the interests of counterparts in Bank teams working in the country and the government.

The countries we study are divided into two groups. The first, referred to as Type I countries, comprises Bangladesh, the Philippines, and Poland. In these countries, aggregate GDP is expected to grow during the crisis, but with a lower trajectory than in the absence of the crisis. As a result, employment and household income are also expected to grow, and the simulation identifies the “losses” incurred by households from lower output growth due to the crisis. In order to determine the impact of the crisis in Type I countries, macroeconomic projections for two scenarios (“non-crisis” and “crisis”) are used to generate two income distributions for the same crisis year. For a given crisis year, the income distribution and poverty estimates of the crisis scenario is compared with those for the counterfactual “benchmark” scenario to determine the impact of the crisis.

Type II countries are defined as those that are expected to experience negative GDP growth as a result of the crisis. In general, this description applies to countries—usually middle-income—with close market links to developed countries that have entered into a recession due to the crisis. For a country like Mexico, which has experienced a contraction in GDP, policy makers and the wider development community are more interested in comparing poverty and income distribution before and after the crisis, rather than comparing the crisis scenario with the counterfactual (for the same year) of what would have happened without the crisis. Therefore, for Mexico we compare the projected income distributions for 2010 and 2011 with the actual income distribution of 2008.

Figure 1.2 shows the difference in how the impact of the crisis is defined for Type I and Type II countries. Since the definition of “impact” is different for the two types of countries, the results of our simulation should be read differently for the two types of countries as well.13
Simulating the Impact of Policy Changes

For Poland and Mexico, the simulations also examine the potential impact of policy changes, specifically expanding existing safety net programs. While social transfers were held constant in real terms (at the baseline year level) for all countries in conducting the simulations, additional scenarios incorporating expansion of specific social programs were considered for Poland and Mexico, since these countries were either implementing (Poland) or considering (Mexico) changes in safety net programs. The results of the policy analyses, summarized in the next section, illustrate the use of microsimulations in projecting the impacts of social policy changes.

In the case of Poland, our analysis also provides insights into the relative roles played by two different types of social programs in mitigating poverty and distributional effects of the crisis. An unemployment insurance program has acted as an “automatic stabilizer” in Poland that (by design) expands automatically as unemployment increases due to the crisis. Given that it operates in a counter-cyclical manner without any deliberate policy shift, the projected impact of the crisis on household incomes and poverty in Poland takes into account the mitigating impact of unemployment insurance. This adds a useful dimension to the simulation results: one can estimate the role that a commonly used stabilizer like unemployment insurance can play in mitigating the crisis impacts, and compare these projections against the simulated effects of the expansion of a targeted social transfer program. While these findings apply to Poland, they offer insights that may be relevant for other countries, especially those with comparable economic characteristics and a similar menu of potential policy responses to macroeconomic shocks.14

Caveats to the Approach

The caveats to this methodology relate to issues relevant for microsimulation approaches in general, as well as those that arise from the modifications we adopt. Below we note some of the most significant caveats.

First, the quality of projections from the model depends on the nature and accuracy of the data underpinning the exercise. While applicable to all simulation approaches, this caveat is particularly important here given our reliance on aggregate macroeconomic projections. Moreover, while macroeconomic projections are available for aggregated sectors like industry, services, and agriculture for all four countries, the lack of more disaggregated projections constrains our ability to account for heterogeneity within each sector. A distinction between formal and informal sectors or tradeable and nontradeable sectors within industry or services, for example, is not possible because the projections are not disaggregated in that form.15

Second, the approach relies on behavioral models built on past data that reflect the pre-crisis structure of labor markets, household incomes and their relationships with household and individual characteristics. These structural relationships are assumed to remain constant over the period for which the projections are made, without allowing for any changes over time or between crisis and non-crisis scenarios. The more distant the baseline year is, the more questionable this assumption is likely to be.16 This caveat, which applies to microsimulation approaches in general, also links back to the constraints imposed by data availability (see above).
Third, our approach assumes that changes in labor market conditions are proportional to the projected change in outputs, based on the estimated past relationship between output and employment. This implicitly assumes stable relationships between output, demand for labor, and labor earnings, which may not hold due to distortions (such as segmentation and downward stickiness of nominal wages) that typically exist in the labor market and are likely to affect adjustments during a crisis.\textsuperscript{17}

Fourth, the model does not allow for geographic factor mobility (labor or capital) across time or scenarios, even as workers experience a change in sector or status of employment. While this assumption is an abstraction from truth, it is likely to matter only when the results are disaggregated spatially or across rural and urban areas. The model does incorporate changes in domestic remittances from urban to rural areas, so that the lack of factor mobility does not necessarily imply constant income flows across space.

Fifth, our approach is limited in its ability to account for shifts in relative prices between different sectors of the economy as a result of the shock. While the poverty impact of shifts in the price of food relative to other prices is taken into account, other potential sources of price impacts are ignored, such as the general equilibrium effect of a change in the terms of trade between agriculture and other sectors. In the absence of a CGE model, it is nearly impossible to explicitly model for such changes.

Sixth, in taking into account the channels through which output shocks are transmitted to households, our approach must predict individual and household-level incomes. But to provide poverty projections for a country that defines poverty in terms of consumption (for example, Bangladesh), household incomes must be converted into consumption, using the (questionable) assumption that a household’s propensity to consume is constant over time and across crisis and non-crisis scenarios. In the absence of more information, however, this assumption has at least the advantage of being simple and transparent.\textsuperscript{18}

The final limitation is related to the validity of the results of the simulations when compared against the actual changes when they occur, and applies to all \textit{ex-ante} approaches. The only true validation would be to combine \textit{ex-ante} and \textit{ex-post} analysis (see Bourguignon and Ferreira, 2003). Since \textit{ex post} data for crisis years will not be available in most countries for some time, some uncertainty about the validity of the simulations is bound to remain.\textsuperscript{19} As we await the availability of such data, a limited validation exercise undertaken for one country (Bangladesh) using historical data suggest that with the benefit of reliable macroeconomic data and output-employment elasticities, the model yields results close to what is observed from actual household data.

\textbf{Results from Micro-Macro Simulations for Four Countries}

Some common patterns are visible in all four countries studied in this report. However, the manner in which the crisis is transmitted to each country differs, which means that the size of the impact is different in each context, as are the profiles of those who bear the brunt of the contraction.

In Bangladesh, the Philippines, and Poland, lower GDP growth is expected to result in the percentage of the population in poverty being 1.2, 1.5, and 0.4 percentage points higher in 2010, respectively, compared to a no-crisis scenario. In Mexico, GDP contracted
by nearly 7 percent in 2009 and is projected to return to pre-crisis levels only by 2011. Mexico’s poverty rate is projected to rise by more than 3 percentage points between 2008 and 2009, and even as growth resumes, the recovery in poverty is expected to be slow. As a result, more Mexicans are projected to be poor in 2011 than in 2008. The poverty impact in Mexico for 2009 is comparable to what was projected by Aran et al. (2010) for Latvia, where GDP was expected to contract by 18 percent between 2008 and 2009, increasing the poverty headcount rate from around 14 percent in 2008 to 20 percent in 2009.

There is little or no impact on aggregate measures of inequality in any of the countries. The aggregate numbers, however, do not tell the complete story of how impacts are distributed. More detailed analysis, using a number of analytical devices, shows that some regions and groups within each country are expected to suffer more losses than others, depending on which sectors and income sources are more affected.

While the impacts on income and consumption are relatively large among middle-income households, the poor in some of the most affected countries are severely impacted as well. Ravallion (2009) has argued that middle-income groups in developing countries are more exposed to a macroeconomic crisis than the rest of the population. Simulations for individual countries partly confirm this view: between 15 and 20 percent of households in the 40th–80th percentiles of the income distribution in Mexico and the Philippines suffer per capita income losses that push them to a lower income decile, which suggests that households in the middle of the distribution suffered a sizeable impact in absolute terms. At the same time, significant impacts are also estimated among poor households relative to their income levels, particularly so in countries where the crisis has been more severe. The poorest 20 percent of Mexican households are projected to suffer an average loss in per capita income of about 8 percent between 2008 and 2009, compared with a 5 percent income loss for the entire population. Similarly, the simulations by Aran et al. (2010) suggest that in Latvia, the bottom 40 percent of the income distribution are hardest hit by the crisis—although the very poorest households in rural areas appear to have been spared somewhat, likely due to their isolation from the formal economy.

The impacts on the middle of the distribution can be attributed primarily to significant employment shocks to manufacturing and service sectors that employ a large number of workers from middle-income households. Urban households suffer more losses, on average, than do rural households in all countries because the manufacturing sector that bears the brunt of the losses in employment and labor earnings is concentrated in urban areas. In the Philippines, for example, per capita income of urban households is projected to decline by 6 percent, compared to a fall of 3 percent for rural households.

Beyond these common patterns, there is considerable variation among countries in how impacts are distributed within countries because of the differences in transmission channels and the structure of economic sectors. Approximately 90 percent of the average loss in per capita household income in Mexico and the Philippines are attributable to a fall in labor income, compared with 50 percent of the average loss in Bangladesh, where an expected slowdown in remittance growth is also important. Losses resulting from lower remittances tend to be more concentrated among better-off households than losses in labor income, mainly because the initial (pre-crisis) distribution of remittances was skewed towards better-off households. This is an important reason why projected income losses in the Philippines are more evenly distributed across the income distribution than in Bangladesh.
The crisis may have also impacted women and men differently. In a world of highly mobile capital and less mobile labor, often the brunt of adjustment to shocks—whether external or internal in origin—falls on labor earnings and hence directly on households (Paci, Revenga, and Rijkers, 2009). Women and men tend to work in different industries and occupations, which may also result in lower productivity among women on average. It is also commonly believed that women tend to hold more precarious jobs, operate in smaller and less capitalized firms, or engage in more vulnerable economic activities than men. These factors would suggest that women are more likely to be affected by economic shocks. The existing empirical evidence is mixed, however. Using data from the Asian crisis, Hallward-Driemeier, Rijkers, and Waxman (2010) show that female employment was not hit the hardest, primarily due to the fact that women were disproportionately employed in firms more resilient to the crisis. On the other hand the gender earnings gap increased, particularly in larger firms, implying that the smaller net employment impact on women came at the cost of a larger reduction in earnings.

Our work shows that impacts of the financial crisis were quite heterogeneous across countries and sectors, with no common patterns by gender and no evidence that women were more affected than men. Other evidence suggests that gender impacts vary significantly by country and are hard to generalize (Sabarwal, Sinha and Buvinic, 2010; Newhouse and Cho, 2010; Turk and Mason, 2009). On the one hand, relatively high female participation rates in export-oriented industries that were the initial casualties of the crisis may have led to strong first-round negative employment effects. On the other hand, lower female participation rates in pro-cyclical sectors, such as construction, or industries dependent on external demand, such as tourism, implied that the aggregate employment effects for women relative to men were muted once these second-round effects are taken into account. The direction of impacts and their gender differences, as well as the channels through which they occur, are likely to depend on the specific nature of the crisis at hand, and merit further analysis.

The simulations also allow us to examine the characteristics of those who are expected to be in poverty as a direct result of the crisis—information that can be of use to policy makers. We find that the “crisis-vulnerable,” namely households who would not have been poor had there been no crisis, tend to have specific characteristics that distinguish them from the “structurally poor” who would have been poor with or without the crisis. On average, the crisis-vulnerable appear to be more educated or skilled than the structurally poor. They are also more likely to be economically active than the structurally poor, indicating that the crisis would have had a sizeable effect on the number of “working poor.” In Mexico, the crisis-vulnerable are more likely to be urban, employed in the manufacturing sector prior to the crisis, and belong to households headed by women compared to the chronic poor and non-poor. In other countries, the crisis-vulnerable fall somewhere between the structurally poor and the non-poor in terms of these characteristics.

Social programs can play a role in determining the characteristics of the crisis-vulnerable in some countries. For example, although most of the impact on household income in Poland is due to losses in labor income, our estimates indicate that a large part of this loss would have been compensated by higher unemployment insurance benefits, which would have reduced the number of crisis-vulnerable among households with formal sector workers. In Turkey, Aran et al. (2010) find that even though the largest
employment impacts are in the middle of the income distribution, most of the welfare losses come from the informal sector where poorer workers are more likely to be employed. Formal sector workers, by contrast, are protected to some extent by unemployment benefits. The simulations also suggest that expansion in targeted social transfers can mitigate some of the impacts on the poorest, depending on the size of the expansion and the size and characteristics of the target population of the program. In Mexico and Poland, for example, expansion of targeted social transfer programs is likely to have benefited a sizeable number of the poorest, in spite of the small impact of the expansion on national poverty rates.

Below we discuss the results of the simulation in more detail, differentiating between Type I and II countries, as defined earlier.

**Results for Type I Countries**

The Philippines, Bangladesh, and Poland show significant heterogeneity in terms of the predicted impact of the crisis both at the aggregate level and by sector (Table 1.1). Total GDP in 2010 is predicted to be 4.9 percent lower under the crisis scenario in the Philippines, 2.2 percent lower in Bangladesh, and 5.3 percent lower in Poland than what it would have been without the crisis—according to projections made by World Bank country economists in early 2010.21 The manufacturing sector is projected to be the most affected in terms of output losses in all three countries, followed by services. International remittance flows are projected to be 1.5 percent lower under the crisis scenario in Philippines, 3.7 percent lower in Poland, and 10.1 percent lower in Bangladesh than what they would have been without the crisis.

**Table 1.1: Macroeconomic impacts for Type I countries**

<table>
<thead>
<tr>
<th></th>
<th>Philippines</th>
<th>Bangladesh</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total GDP</td>
<td>−4.9</td>
<td>−2.2</td>
<td>−5.3</td>
</tr>
<tr>
<td>Agriculture</td>
<td>−2.6</td>
<td>0.3</td>
<td>5.2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>−6.7</td>
<td>−3.9</td>
<td>−10.1</td>
</tr>
<tr>
<td>Services</td>
<td>−4.6</td>
<td>−2.1</td>
<td>−3.4</td>
</tr>
<tr>
<td>Remittances</td>
<td>−1.5</td>
<td>−10.1</td>
<td>−3.7</td>
</tr>
</tbody>
</table>

*Source:* World Bank.

*Note:* 1. Impact calculated as % difference between 2010 projected crisis GDP (or remittances) and 2010 projected benchmark GDP (or remittances). A negative number indicates lower GDP (or remittance) due to crisis. 2. These figures are based on projections (not actual estimates) of GDP, as of early 2010 by World Bank country economists.

Using information on aggregate and sectoral output elasticities of employment for each country, projected changes in GDP can be translated into projected changes in total and sectoral employment (Figure 1.3). Employment losses are consistent with overall outputs shocks, with Poland suffering the most on both macro and micro fronts, and Bangladesh the least. At the sectoral level, however, services account for the bulk of employment losses in all countries but Bangladesh, even though manufacturing is projected to suffer the largest output shock in all three countries. In other words, for two out of the three countries the output elasticity of employment in the service sector is higher than that in the manufacturing sector.
Not surprisingly, household income is projected to fall in all three countries as a consequence of reductions in both labor and non-labor income (Figure 1.4). The relative importance of shocks to each of these income sources varies by country, however, reflecting variation in the role of different transmission mechanisms and policy environments. For example, Poland suffers the lowest shock to total household income, despite sizeable shocks in both labor income and remittances. This is because of inbuilt stabilization by unemployment insurance, which protects income (by increasing non-labor income) in the face of employment losses. Bangladesh, which is relatively insulated from employment losses, experiences a larger shock to household income than Poland, mainly due to lower remittances that translate into lower non-labor household income. In the Philip-
pines both labor and non-labor household income are projected to fall as a consequence of the crisis. Both Bangladesh and the Philippines lack a large unemployment insurance scheme that could act as a stabilizer against loss in labor income.

Losses in household income translate to significant increases in both the level and depth of poverty in all three countries compared to the non-crisis scenario (Figure 1.5). The Philippines is projected to experience the largest percentage increase in the poverty headcount and in the poverty gap, which measures the mean distance from the poverty line (that is, the “depth” of poverty), while Poland is shielded from large increases in poverty by the protection provided by unemployment insurance schemes. Although income losses are larger in the Philippines, the poverty increase is actually slightly larger in Bangladesh. This could indicate that those impacted in Bangladesh are nearer to the poverty line than their Filipino counterparts. There is, however, little impact on aggregate inequality in any of the countries.

Aggregate macroeconomic and average microeconomic impacts on employment, income and poverty hide a significant amount of heterogeneity across households and individuals. We examine this issue in more detail in two ways. First we compare those households that are projected to be poor in the crisis scenario and would not be poor in the hypothetical no-crisis scenario in 2010 (the “crisis vulnerable”) with others in the population. For this purpose we distinguish between structurally poor households—households observed to be poor in the baseline year and projected to remain poor under both the benchmark and crisis scenarios in 2010—and the average household. Second, we examine how shocks are distributed along the entire income distribution, irrespective of whether households are projected to become poor as a consequence of the shock.

The most notable characteristic about the crisis-vulnerable is that they suffer income losses ten times greater (in percentage terms) than those of the general population (Figure 1.6). Interestingly, the relative weights of labor and non-labor incomes within the overall income loss are unchanged. The changes are driven primarily by labor income in the Philippines and Poland, and by non-labor income in Bangladesh. The fact that such large income losses are responsible for increasing poverty implies that people are falling

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**Figure 1.5: Percent change in poverty/inequality indicators between crisis and benchmark**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Philippines</th>
<th>Bangladesh</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty Headcount</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty Gap</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gini</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

into poverty from parts of the distribution that are not close to the poverty line. This is most likely driven by the urban middle class, which is mostly engaged in the hardest-hit sectors of manufacturing and services.

In addition, crisis-vulnerable households have “better” characteristics than structurally poor households, but “worse” than those of the average household. Crisis-vulnerable households are likely to be more urban than the structurally poor in all three countries, and more rural than the general population in Poland (Figure 1.7). In the Philippines, 57 percent of crisis-vulnerable households live in rural areas, compared to 74 percent of structurally poor households and 51 percent of the national population. In two out of three countries, crisis-vulnerable households are smaller and with lower dependency ratios than their structurally poor counterparts. In Poland, however, structurally poor households are about the same size as crisis-vulnerable households, and all household types have almost the same (very low) dependency ratios.
The characteristics of crisis-vulnerable household heads are also significantly different from those of other groups in the population. In all three countries, crisis-vulnerable household heads are relatively more skilled than those of structurally poor households, but less skilled than those of the average household (Figure 1.8). This is consistent with the pattern of middle-income households suffering the largest impacts (in absolute terms) of the crisis, since they are more likely to be urban and employed in the formal sector (and therefore more skilled) than household heads among the structurally poor. In addition, heads of crisis-vulnerable households are younger on average and more likely to be male than household heads among the general population.

We turn now to the distributional impact of the crisis by examining how income losses are allocated across different households in urban and rural areas. For this purpose, we map out income losses between the benchmark and crisis scenarios at every percentile in both the urban and rural income distributions using what are called growth incidence curves. We order households according to their pre-crisis per capita household income level (from lowest to highest), group them into income percentiles (as defined in the benchmark case), and plot the average percentage loss in per capita household income by percentile. We perform this exercise for all households as well as for rural and urban groups, which allows us to compare percentage income losses across households within the group. Note, however, that comparisons across rural and urban groups are not straightforward because income percentiles are group-specific rather than population-specific. For instance, given that on average income levels are higher in urban than in rural areas, a household in the 30th percentile of the urban income distribution is likely to be significantly better off than a rural household in the 30th percentile.

In all three countries, income losses associated with the crisis tend to be larger in urban compared to rural areas (Figure 1.9). This is consistent with employment losses being relatively concentrated in urban areas, where manufacturing and service sector jobs tend to cluster. In addition, there are important differences across countries in dis-

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**Figure 1.8: Percentage of households with low-skilled heads**

![Figure 1.8: Percentage of households with low-skilled heads](image)

*Source:* World Bank.
tributional impacts within urban and rural areas, because of difference in the sources of impact across countries. In the Philippines, the main impact is felt on labor income in the manufacturing and services sectors. Since these income sources are important for most urban households, the impact is more or less uniformly distributed across the urban distribution (Figure 1.9a). In Bangladesh the loss in non-labor income due to a decline in international remittances is an important source of impact. Since remittances are more skewed towards the better-off among rural households than among urban households, the impact is skewed towards the middle and upper ends of the distribution for rural households and more uniformly distributed for urban households (Figure 1.9b). In Poland, the main impact is felt on non-agricultural labor income, which results in the losses being distributed quite uniformly across urban households; at the same time the growth of the agriculture sector in the wake of the crisis absorbs much of the employment loss from other sectors, thereby raising the incomes of poor rural households (Figure 1.9c).

Growth incidence curves provide information about income losses incurred by the average household within each percentile of the income distribution, and are thus useful in identifying what income groups suffer relatively larger or smaller losses. However, they can hide a significant amount of heterogeneity in the absolute size of impacts; even

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**Figure 1.9: Growth incidence curves: percent change in income (relative to the benchmark) due to crisis**


Note: The horizontal axis shows percentiles of per capita income (consumption in case of Bangladesh) in the benchmark (without crisis) scenario. Vertical axis shows percentage change in per capita income (consumption for Bangladesh) between the benchmark and crisis scenarios for the same year, for every percentile (1 percent) of the distribution.
among households with very similar pre-crisis per capita household income levels. An alternative way of evaluating the distributional impact of the crisis is to examine the size of the income shock suffered by households in each income group. We do this by focusing on income shocks large enough to push households to a lower decile, as defined by the benchmark distribution.23

The results confirm that those in the middle of the distribution are the hardest hit in terms of absolute level of income change (as opposed to percentage change, as with the growth incidence curves) in all three countries (Figure 1.10). Although most households tend to stay in the same decile, approximately 15 percent of all households suffer income losses that push them to a lower decile. Moreover transitions downwards are concentrated in the middle of each of the distribution, indicating that middle-income households are most likely to suffer large income losses due to the crisis. Movements up are generally rare, except in Poland where safety nets (particularly unemployment insurance) protect those at the bottom of the distribution and move them up to a different decile.

In sum, in all three Type I countries considered here, the crisis would have resulted in significant output, employment and household income losses, compared to a hypothetical no-crisis scenario. As a consequence, the incidence and depth of poverty are projected to increase. Moreover households predicted to become poor as a consequence

![Figure 1.10: Transitions across deciles of per capita income (percent of households in each decile)](image)

of the crisis appear to be different from both structurally poor households and the average household in terms of both their pre-crisis income levels and their characteristics. Finally, households in the middle of the income distribution are projected to bear the brunt of the adjustment in absolute terms.

We turn now to the analysis of impacts in countries with projected absolute GDP losses in 2009 and 2010 (Type II countries), using the case of Mexico as an illustration.

**Results for Type II Countries**

Mexico suffered significant total and sectoral GDP losses in 2009 and is projected to return to positive albeit modest economic growth in 2010–11 (Figure 1.11). Given these patterns, we distinguish between a crisis period (2008–09) and a recovery period (2010–11) in the discussion that follows. Remittances are expected to rise during the crisis and then return to pre-crisis levels during the recovery. The predicted countercyclical behavior of international remittances assumes increased efforts by migrants abroad, in the form of higher transfers, to support their families in times of economic distress.

As before, we use estimated values of the output elasticity of employment to calculate projected employment impacts in 2010 and 2011, using actual employment data for 2009. The size of the labor force is predicted to grow over time as a consequence of population growth, but labor force participation rates remain relatively constant during 2009-2011 at around 66 percent (Table 1.2). In contrast, employment levels declined in 2009 and are projected to recover only slightly in 2010 and 2011. The combination of stable participation rates and stagnant aggregate employment levels during the crisis translated into an increase in the unemployment rate from 4.5 percent in 2008 to 6.2 percent in 2009, although this trend subsides as the market absorbs more workers by 2011. Sectoral employment shares remain stable between 2008 and 2011, except for small drops in the shares of agriculture and manufacturing that are absorbed by the services sector.

![Figure 1.11: Macroeconomic projections for Mexico (2008–09 are actual observations; 2010–11 are forecasts)](source: World Bank.)
Table 1.2: Employment projections (population of age 15+ yrs)

<table>
<thead>
<tr>
<th>Employment status (millions)</th>
<th>Actual</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>Inactive</td>
<td>23.3</td>
<td>23.8</td>
</tr>
<tr>
<td>Active</td>
<td>44.5</td>
<td>45.4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>2.0</td>
<td>2.8</td>
</tr>
<tr>
<td>Employed</td>
<td>42.5</td>
<td>42.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sectoral shares (% of employed in each sector)</th>
<th>Actual</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>12.0</td>
<td>12.1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>16.6</td>
<td>16.5</td>
</tr>
<tr>
<td>Other industries</td>
<td>9.8</td>
<td>9.8</td>
</tr>
<tr>
<td>Services</td>
<td>61.6</td>
<td>61.6</td>
</tr>
</tbody>
</table>


The evolution of employment, earnings and remittances determines to a large extent observed and projected changes in household income, since combined they account for more than 80 percent of total household income. In the crisis period, total household income is projected to fall by 6 percent due primarily to an 8 percent drop in labor income and a much smaller (1 percent) drop in non-labor income (Table 1.3).24 As aggregate output and employment recover after 2010, household income is projected to grow at around 2 percent annually, while non-labor income stays relatively stagnant.

Both the level and depth of poverty are expected to increase as a result of crisis, and remain higher than 2008 levels even after the crisis subsides. The poverty headcount rate is expected to increase by 3.4 percentage points from 2008 to 2009 due to the crisis (an additional 3.6 million people in poverty), and then decline by around 2 percentage

Table 1.3: Projected household income and its sources

<table>
<thead>
<tr>
<th></th>
<th>Actual (peso/mo)</th>
<th>Projected (% change from previous year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>Total HH income</td>
<td>11,409</td>
<td>−6.1</td>
</tr>
<tr>
<td>HH labor income</td>
<td>8,466</td>
<td>−8.2</td>
</tr>
<tr>
<td>HH non-labor income</td>
<td>2,180</td>
<td>−0.6</td>
</tr>
<tr>
<td>Remittances</td>
<td>136</td>
<td>−2.5</td>
</tr>
<tr>
<td>Pensions and other private transfers</td>
<td>891</td>
<td>0.7</td>
</tr>
<tr>
<td>Capital income</td>
<td>215</td>
<td>−8.8</td>
</tr>
<tr>
<td>Safety nets (Oportunidades, Procampo, etc.)</td>
<td>212</td>
<td>0.4</td>
</tr>
<tr>
<td>Other (public transfers)</td>
<td>726</td>
<td>0.4</td>
</tr>
<tr>
<td>Mean earnings per worker</td>
<td>5,364</td>
<td>−6.4</td>
</tr>
</tbody>
</table>

Source: INEGI and projections.

Note: Total HH income also includes implicit rent.
Knowing, When You Do Not Know

The poverty gap is expected to show a similar trend. However, the rise in the depth of poverty between 2008 and 2009 is much higher than that in the poverty headcount, relative to the baseline (2008) levels—increases of 11 percent for the poverty gap, compared with a 7 percent increase in the headcount. This suggests that the crisis had a strong impact on those who were already poor, which is not reflected in the projected rise in poverty headcount. As with the Type I countries, aggregate inequality is expected to stay stable through the entire period.

We turn next to the household-level impacts of the crisis and the recovery. As before, we look at households that move in and out of poverty, as well as impacts across the entire income distribution. We present results for the crisis and recovery periods separately, so as to be able to distinguish between crisis-vulnerable households (that is, households that are projected to fall into poverty as a consequence of the crisis) and households that are “poverty-exiters” (that is, households that are projected to exit poverty in 2010–11). This allows us to compare the profiles of affected households across groups and time.

The Crisis Period, 2008–09

Crisis-vulnerable households are projected to suffer large income losses in 2008–09, with a 24 percent drop in average household income and a 32 percent loss in per capita income. Almost all of this loss comes from a 28 percent loss in household labor income. Crisis-vulnerable households are more likely to be urban and slightly more likely to be headed by a woman, compared to structurally poor households and the average household. In addition, the heads of crisis-vulnerable households are more likely to be employed in the manufacturing sector and less likely to be employed in agriculture in 2008 than the heads of other households.

As in Type I countries, income losses are higher in urban compared to rural areas across the distribution—the average household in urban areas suffers a larger shock than the average household in rural areas (Figure 1.12). This difference is likely due to the fact that the crisis was most felt in manufacturing and services, both sectors that traditionally locate in urban areas.

Per capita household income losses are largest among those at the bottom of the 2008 income distribution (0 to 10th percentiles), with average losses ranging between 4 and 9 percent. Households in the 11th percentile and above suffer losses of about 4 percent, with no significant differences across percentiles. This confirms that the crisis disproportionately affected those who were already in a dire situation in 2008.

Table 1.4: Poverty and inequality with and without crisis (constant poverty line)

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>Poverty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headcount rate</td>
<td>47.5</td>
<td>50.9</td>
</tr>
<tr>
<td>Poverty gap</td>
<td>20.3</td>
<td>22.4</td>
</tr>
<tr>
<td>Inequality (per capita income)</td>
<td>0.52</td>
<td>0.52</td>
</tr>
<tr>
<td>Gini</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Microsimulations using macro projections and INEGI.
Finally, households in the middle of the distribution are most impacted by the crisis in terms of the absolute size of the income loss (as opposed to percentage change, as with the growth incidence curve). Although approximately 85 percent of all households remain in the same income decile, most of the downward movements are concentrated in the middle of the distribution, namely in the 4th to 7th deciles (Figure 1.13). Between 20 and 22 percent of households in these deciles suffer income losses as a consequence of the crisis that push them to a lower decile.


Figure 1.12: Growth incidence curve for Mexico (2008–09)


Figure 1.13: Transitions across deciles in Mexico

The evidence presented in Figure 1.13 is not inconsistent with the results depicted in Figure 1.12, which suggested that income losses were largest at the bottom of the distribution both in urban and rural areas. First, Figure 1.12 captures percentage changes in income, whereas Figure 1.13 is constructed on the basis of absolute changes in income. This implies that a loss of similar magnitude would (i) represent a much larger decline, in percentage terms, for households at the bottom of the distribution than for households in the middle or at the top, but (ii) at the same time would lead to more transitions across deciles in the middle of the distribution, where income brackets are narrower, than at the extremes. Second, Figure 1.13 focuses on movements across deciles rather than within income deciles. Since, by construction, those in the bottom decile cannot move further down and those in the highest decile cannot move further up, Figure 1.13 “misses” shocks to the bottom and top deciles. Third, as mentioned above, Figure 1.12 captures average impacts while Figure 1.13 also captures how many households received a shock in a particular decile.

The Recovery Period, 2010–11

We now turn to the recovery period and perform similar analysis to that described for 2008–09 with a focus on those who exit poverty as positive economic growth resumes, as well as on the distributional impacts of this growth.

Households that escape poverty in 2010–11 are projected to experience significant income gains over the period, mostly due to a gain in labor income. “Exiter” households experience a 34 percent increase in average household income and a 48 percent increase in per capita income. Almost all of the growth in income comes from a 42 percent gain in household labor income.

Household heads among exiters are more likely to be employed in manufacturing than any other groups. This is not surprising since this sector is predicted to grow rapidly during this period. Perhaps more surprising is the fact that these individuals are less likely to be employed in services than comparator groups, despite relatively strong growth in the sector. Even though most individuals heading households that exit poverty during this period are predicted to be employed in the services or manufacturing sectors, their distribution across the two sectors is more skewed toward manufacturing compared to the sectoral distribution of the crisis-vulnerable. Similarly, the percentage of rural households and households headed by women is slightly higher and lower, respectively, among poverty exiters than it was among the crisis-vulnerable.

These differences suggest that although those who became poor during the crisis are more likely to exit poverty during the recovery than those who are structurally poor, the two processes are not entirely symmetrical. As a result, some of those who fell into poverty may become structurally poor, and some of those who were structurally poor may be now pulled out of poverty. These dynamics will be a function mainly of relative growth rates and employment creation across sectors and across space.

Projected economic growth in 2010–11 is expected to translate into higher income across the entire distributions and in both rural and urban areas (Figure 1.14). Growth at the bottom of the distribution is predicted to be significantly faster, particularly in rural areas, where households in the bottom 0–20th percentiles are projected to experience an average 8 percent increase in per capita household income, compared to 4 percent
for the rest of the distribution. The bottom of the urban distribution is also predicted to grow faster than the rest, but higher income growth is concentrated on a narrower band (0–10th percentiles) and is lower in magnitude than that observe in rural areas. More generally, projected income growth in urban areas appears to be slightly lower than in rural areas, particularly in the middle of the urban distribution, although differences are not very significant.

As was the case above, there is significant churning across income deciles once we move beyond average income changes (Figure 1.15). Interestingly, this churning is more evenly distributed across deciles compared to the transitions in the crisis period. We
now observe a significant percentage of households in the bottom deciles experiencing income gains that are large enough to place them in a higher decile, and the highest proportion of upward movers is now concentrated in the low-middle section of the distribution (3–6th deciles as opposed to 4–7th deciles in 2008–09). Labor income seems once more to be the main force behind the observed dynamics.

**Simulating the Impact of Policy Responses**

The model presented here can be used to predict the potential impact of policy responses, particularly the type of policy measures that are intended to directly compensate affected workers and households for their losses, or protect the poorest against deprivation as a result of the crisis. To illustrate the potential use of the model in such scenarios, we highlight examples of simulations conducted for two countries, Poland and Mexico, focusing in both cases on the impact of an increase in social assistance on poverty and income distribution.

The results for Poland in the previous section show that unemployment insurance, if administered according to pre-crisis rules, would have had a significant stabilizing effect on household incomes. The combination of lower employment levels and earnings translates into household labor income being 3 and 5 percent lower in 2010 and 2011, respectively, as a result of the crisis, while non-labor income is 3 and 2 percent higher, mainly due to unemployment insurance benefits. Since non-labor income accounts for about 30 percent of the average household’s income, its increase offsets some of the losses in labor income. As a result, the poverty headcount rate is projected to be higher by just 0.4 and 0.7 percentage points in 2010 and 2011, respectively, due to crisis. A stabilizing influence of unemployment insurance is also found by Aran et al. (2010) for Latvia, where the poverty rate is simulated to be around 20 percent with unemployment insurance as opposed to 23 percent in its absence.

To simulate the impact of increase in family allowance or social transfers in Poland, two scenarios for non-labor income were computed for each year (2010 and 2011). While both these scenarios included a projected increase in unemployment insurance payments, one of them also included a 20 percent increase in family allowance transfers that was a part of the government’s crisis response package. The increase in social transfers is projected to have reduced the poverty headcount rate by a further 0.3 and 0.2 percentage points in 2010 and 2011, respectively. This is due to an increase of 0.1 percent in average household income, which includes larger increases of 0.7 and 0.3 percent for the structurally poor and the crisis-vulnerable, respectively. After accounting for the impact of the increase in social transfers, the impact of the crisis on poverty headcount rate amounts to just 0.1 and 0.5 percentage points in 2010 and 2011, respectively.

In the case of Mexico, the model is used to simulate the impact of the introduction a broad policy package to protect poor households in the wake of the crisis. The package includes an expansion of existing safety net programs—Oportunidades and the Nutrition Assistance Program (*Programa de Apoyo Alimentario*—PAL)—to increase the number of beneficiaries by a total of 1 million. The simulations considered two different hypothetical targeting scenarios based on existing targeting methods in the country. Both scenarios are projected to reduce the incidence and/or depth of poverty as compared to the status quo, although the size and nature of the impact would vary with the choice of targeting method. Scenario 1 assumes perfect targeting of the poorest, namely that new beneficiary households would be those with the lowest welfare scores nationally
(among non-beneficiary households), using the proxy means test (PMT) formula used by the program. Scenario 2 assumes that new beneficiary households are chosen among poor households that are closest to the poverty line nationally, again using the welfare score computed by the PMT used by the program. While neither of these extreme scenarios would reflect the actual targeting strategy employed by the government, they are useful in providing an upper and a lower bound on the poverty impact of the potential program expansion. Scenario 2 provides an upper bound on the potential change in the poverty headcount that could be generated with the proposed expansion in coverage, while scenario 1 provides a lower bound. The converse is true about changes in the poverty gap and the severity of poverty.

For the first scenario, the chronic poor are projected to benefit the most from the proposed expansion, particularly in urban areas. The poverty headcount rate is not projected to decline in 2010 and 2011 as a result of the program expansion, which is not surprising. Firstly, 1 million additional beneficiaries represent a large expansion with respect to the existing coverage of the both programs, but only about 2 percent of the projected number of moderate poor in Mexico in 2010. Secondly, since households with the lowest welfare score are selected, new beneficiaries are likely to be so far away from the moderate and even the extreme poverty lines that the transfers would not be sufficient to take them out of poverty.\textsuperscript{25} The impact is however larger on the depth (poverty gap) and severity (squared poverty gap) of poverty, since the transfers reduce their distance from the moderate and extreme poverty lines. The second scenario would result in higher impact on poverty headcount—1.8 and 1.7 percentage point reduction in 2010 and 2011 respectively—than for scenario 1, but a lower impact on depth and severity of poverty.

Regardless of whether the actual expansion was closer to scenario 1 or 2, new beneficiary households are much more likely to have been chosen among the chronic poor than among other groups (the new poor and the non-poor).\textsuperscript{26} This is consistent with the official program goal of serving the extreme and chronic poor.

**Conclusion**

Using the example of four countries facing the recent financial crisis, the approach described here intends to provide analysts with a tool to project the welfare impacts of macroeconomic shocks in the absence of real-time micro data on employment, earnings, or income. The examples also show that focusing only on aggregate poverty and inequality indices, as typically allowed by methods often used by analysts responding to demands for quick simulations, would provide a narrow and partial view of the distributional impact of the crisis in a country. In the Philippines and Bangladesh, for example, even though the impact on aggregate poverty and inequality is low, some groups are estimated to suffer a disproportionately high impact. Urban households are projected to suffer relatively larger losses than rural households in the Philippines, and within-urban area losses are higher for the poor and the middle class. In Bangladesh, the estimated impact is particularly significant for the top half of the distribution, with the urban middle class being one of the most affected groups. How the impacts of shocks are distributed in a country and what that implies about the characteristics of vulnerable groups can be valuable information for policy makers in a number of different ways.

Firstly, the simulation results provide information on the people likely to suffer the most losses, and can therefore inform the design of policy responses. The fact that the
crisis-vulnerable and the structurally poor differ significantly in their characteristics in all countries suggests that expanding existing safety net programs intended for the structurally poor to mitigate the losses of the crisis-vulnerable may not be effective or practical. Instead, interventions that address increased levels of vulnerability and protect households against risk may be required. In some cases, the distributional impacts can also have political economy implications that in turn matter for policy responses. For example, the substantial losses suffered by the urban middle-income and poor households are important factors to take into account because of the disproportionate influence these groups can have on public perceptions and the political debate in a country.

Secondly, as the section above, “Simulating the Impact of Policy Responses,” illustrates, the model can also be used to simulate the impact of particular policy interventions, especially those that directly affect household income. While the results of such simulations vary significantly by country, certain lessons can be generalized. In countries where losses in labor income dominate, automatic stabilizers like unemployment insurance (as in Poland and Latvia) can mitigate the poverty impact to a significant degree. While losses in non-labor income due to fall in remittances cannot be compensated by automatic stabilizers, social assistance programs can potentially play a role in mitigating some of these losses. Even in the context of labor income losses, which part of the market is affected by the crisis can be an important consideration for policy makers, since automatic stabilizers would typically apply to workers in the formal sector only. In a country like Mexico, where automatic stabilizers are nonexistent or limited in their coverage of affected workers, expansion in social assistance can be effective in mitigating some of the impacts of the crisis on the poor. Expanding the coverage of the Oportunidades and PAL programs in Mexico by a total of 1 million households in 2010 could have reduced the depth of poverty by up to 2 percent or the poverty headcount rate by up to 1.8 percentage points, depending on what targeting strategy was employed to select the new beneficiaries.

Thirdly, the simulation exercise can help identify a list of possible “leading indicators” that can be monitored rapidly to gauge the likely welfare impacts of a crisis, in the absence of real-time information on household income/consumption. Although the appropriate choice of indicators would depend on the main transmission channels in a specific country, manufacturing employment, wages, remittance flows, and relative food prices emerge as potential candidates for monitoring in all four countries.

Information on the simulated impact of both shocks and potential policy interventions proved to be a valuable input into the policy discussion during the crisis, and will continue to be relevant for policy makers and analysts when real-time data is not available. The methodology discussed here, as well as possible refinements and improvements to this approach, is therefore likely to remain relevant. Clearly, the model is applicable to a number of country contexts and for addressing a range of questions related to distributional impacts of an economic shock. Minimum data requirements include up-to-date macroeconomic projections by sector, with and without crisis, and a fairly recent household survey with income data that can be classified by sector.

Looking ahead, the analytical tool would benefit from future efforts to extend or nuance the approach used here, as long as such efforts are tailored to the availability of data and the specific country context. For example, the availability of more disaggregated macroeconomic projections would allow for a more detailed distributional analysis, to capture movements within sectors and across types of employment. Availability of
better migration data in household surveys could allow for explicit modeling of migration decisions for countries where remittances are an important source of household income, as opposed to the somewhat arbitrary rules applied in the simulations here. And availability of surveys conducted during a crisis (such as quarterly labor force or rapid monitoring surveys), which hint at some of the impacts in real time, can be useful in fine-tuning the model to take into account unanticipated changes in relative prices or in the labor market. Exploring such extensions to the model, along with improving the availability of data that make such extensions possible, would be a worthwhile future area for international institutions like the World Bank to invest in, to inform the advisory and financial support they often provide to countries affected by macroeconomic shocks.

Notes

1. The full studies for Bangladesh and the Philippines are available as World Bank Policy Research Working Papers (Habib et al. 2010a and 2010b). Some of the early results are also summarized in an Economic Premise published by PREM Network, World Bank (Habib et al. 2010c). Full results for Mexico are presented as a chapter in World Bank (2010, draft); the Poland results are summarized in an annex to a World Bank loan document.

2. In addition to these four countries, simulations have also been conducted for Mongolia (draft paper under review) and for the impact of natural disasters (cyclones) in the Philippines. The results of these exercises are not discussed in this chapter.

3. While a number of other simulation exercises are likely to have been conducted at the Bank to simulate welfare impacts of the crisis from pre-crisis data, this report refers primarily to Aran et al. (2010), since their methodology and approach are the closest to ours. Unlike most of the other exercises, their methodology and results are also readily available in the form of a comprehensive, citable source.

4. See Kannan (2009) and Kannan et al. (2009). They cite research done at the IMF on patterns of recovery from financial crises in advanced economies, which shows that recessions associated with financial crises tend to be severe and recoveries from such recessions are typically slow. It takes almost three years to return to the pre-recession output level—twice the time it takes to recover from other recessions.

5. There is little consensus in the development literature about how to define the “middle class”. A number of different definitions have been used, such as Blackburn and Bloom (1987), Beach (1989), Levy and Murnane (1992), Jenkins (1995) and Burkhauser et al. (1999). For our purpose, we define the middle class broadly as those above the poverty line but below the richest decile (10%) of the population. In Bangladesh, this is the group between the 40th and 90th percentiles of per capita expenditure or income.

6. See World Bank (2011) for a discussion of channels through which the poor in Europe and Central Asia were impacted during the financial crisis.

7. See Bussolo (2008), Bourguignon et al. (2005), Ganuza et al. (2002) and Ganuza et al. (2006). Another common approach is PovStat, an Excel-based World Bank simulation package, which uses household survey data and macroeconomic projections as inputs and estimates changes in poverty and inequality indicators. Although it allows for impacts to occur through multiple channels, it focuses exclusively on household heads and therefore does not allow for a full accounting of labor market impacts. Also, it does not offer an easy way to examine changes in non-labor income (such as remittances), which has important implications for crisis impacts in some countries.

8. For a more detailed description than what is provided here, see Habib et al. (2010a, 2010b).

9. The estimations of employment status (though a multinomial model) are done separately for urban and rural areas, and those of earnings (an OLS model) are done separately for each sector.

10. For some countries the assignment rule is also such that the regional distribution of remittances in the crisis year remains identical to that in the baseline year.

11. Note that by construction, the projected income/consumption distribution for a crisis year is expressed in terms of prices in the baseline year. This would imply that in order to obtain poverty
estimates that are comparable with the baseline estimates, the baseline poverty line should be kept unchanged in real terms.
12. See Habib et al. (2010a, 2010b) for more details on how the adjustment for food price inflation is applied to the poverty line.
13. To state an obvious point: either type of comparison, Type I or Type II, is possible for any country. The differentiation between the countries is therefore purely driven by what type of comparison was found to be most useful by the Bank country team and the government of that country.
14. Note that the policy being simulated should ideally have a large enough macroeconomic impact to carry through to the micro level. This is usually achieved by countrywide policies, for example, unemployment insurance.
15. Aran et al. (2010), on the other hand, are able to use macro data from Turkey to disaggregate their microeconomic outputs into formal and informal sectors.
16. In the case of Bangladesh, for example, the baseline year is 2005, which is a full four to five years away from the prediction years (2009 and 2010).
17. Sectoral movements of labor are modeled as depending only on individual/household characteristics (through the multinomial logit model) and population growth. This cannot take into account the kind of structural shifts that have apparently been observed in some countries due to the crisis, such as a reduction in the relative demand for skilled labor.
18. The use of this assumption for Bangladesh would not have affected the results significantly, given the high correlation between household per capita income and consumption in the baseline Bangladesh data. The validation exercise also suggests that the simulation results are reasonable in spite of this naïve assumption.
19. Importantly, even when household data capturing the impact of the crisis becomes available, a true validation of the simulation results will be difficult in case of Type I countries, since the actual household data cannot be used to generate the counterfactual scenario of what household incomes and employment would have been in the absence of the crisis. Even in the case of Type II countries, a before-after ex post comparison may not constitute a validation of the ex ante simulation if the actual policy responses are different from what was included in the simulation.
20. Aran et al. find that in Latvia, unemployment insurance would have reduced the crisis poverty rate by as much as 3 percentage points.
21. Note that actual GDP figures for 2010, which are available by now, may be different from these projections.
22. It is important to note that within a given country, those receiving most of their total household incomes from one or other of the two sources tend to have different characteristics. As a result, these differential impacts in labor and non-labor income have significant distributional implications.
23. We plot the share of households in each decile who: (i) suffer an income loss large enough to shift them to a lower income decile (that is, had the income distribution at benchmark been equal to that in the crisis scenario, these households would have fallen to a lower income decile); (ii) suffer a relatively small income loss and therefore their position does not change much (that is, had the income distributions been equal in the two scenarios, these households would have remained in the same income decile); and (iii) suffer a positive shock and therefore are better off in the crisis scenario (that is, had the income distribution in the crisis been equal to that at benchmark, these households would have climbed to a higher income decile).
24. While macroeconomic data on output and employment for 2009 was available at the time the report was prepared, no post-crisis household-level information existed. The last National Household Income and Expenditure Survey (Encuesta Nacional de Ingresos y Gastos de los Hogares—ENIGH) was collected in 2008 and data from the next round scheduled in 2010 has become available as this study is being completed. None of the analysis here is based on actual data during or after the crisis; all results on the impacts of the crisis and the subsequent recovery are from the microsimulations using pre-crisis household survey data.
25. The average simulated Oportunidades (PAL) transfer is equal to 76 percent (28 percent) and 17 percent (10 percent) of the extreme and the moderate poverty gaps, respectively.
26. The chronic poor can be understood as either those who were poor before the crisis and remained so or those who were poor after the crisis and have a low probability of exiting poverty by 2011.
When a society suffers a big economic shock, what should be done? How does what should be done relate to what is typically actually done in practice? And where there is a difference, how can technical analysis serve to understand and reduce this gap?

At first sight, the question of what should be done looks simple. Big adverse shocks are surely less subtle in their policy demands than solving questions of long-run growth, industrial policy, or service delivery. The problems are clear, there is political pressure to do something, and the motivation to act is much higher, amongst government agencies and civil society. Or at least the problem should be clear, since the classic shocks—commodity price changes, sudden stops in financial flows, international slowdowns, harvest failures, floods and so on—are, unfortunately, repeated again and again. There should be substantial experience of the consequences of the shocks, and of alternative responses. Then the task of government, and of supporting external agencies, is to adjust policy to provide greatest relief to those hardest hit, and those most likely to be permanently hurt.

Both interpretation and policy design is, however, a lot murkier and more complicated than this account would suggest. As the 2010 debates in the post-financial crisis industrialized world illustrate, there is even substantial professional and political disagreement over the basic intertemporal decisions over optimal deficit and debt management for the whole economy. Beyond aggregate choices the questions are deeply distributional, with respect to short and long-run effects across households, individuals, and groups. This substantially complicates matters. Transmission mechanisms from shocks to different groups and their behavioral responses are often ill-understood, and only weakly integrated into a coherent overall account. Working out what is optimal is not trivial.

When we turn to what is typically done in practice, further complications arise. There are two kinds of reason why actual responses can diverge from what is optimal. First, as just indicated, optimal policy may itself be unclear, especially where short-run information on actual effects is unavailable. Systematic information collection in developing countries almost always comes with a lag, sometimes of years (for example, for national household surveys in poorer countries). Second, when many individuals, firms, or groups are taking a hit, the natural tendency is to act to protect your assets, consumption, or other dimension of (household or firm) well-being. Yet the capacity to act, in terms of information, resources, political influence, or other connections, is likely to be highly heterogeneous, and much more likely to be positively correlated with wealth, sta-
tus, and power. And this will often be exactly the opposite of the simple view on optimal policy suggested above.

All this underlies the potential desirability of an approach to analysis and policy interpretation that combines:

- Practicality and timeliness
- Enough sophistication to capture the heterogeneity of transmission mechanisms and behavioral responses
- Political salience.

This is a tall order. But it is an important challenge for development practitioners, with precisely the kind of technical and political economy mix that should lie at the heart of development work.

The point of departure of this essay is a reaction to a set of practical models for analyzing the poverty and distributional impacts of crises. These lie precisely in this domain. These are described in other contributions to this volume. They were sponsored by, and in many cases undertaken within, the World Bank. However, most of the issues at stake actually have nothing to do with the World Bank itself—since both the questions and the modeling approach are of general concern and practice. The bulk of this essay will assess the approach in this broader context. At the end I briefly discuss the specific question of the World Bank’s role.

The technical work was inspired by the series of economy-wide shocks that have hit developing countries in the last few years—from big increases in food and oil prices, to the more complex shocks associated with the international financial crisis, which affected both external demand for goods and international financial markets. The concern is with systemic shocks experienced by a country, as opposed to the individual shocks that households suffer owing to idiosyncratic influences, for example from ill-health, job loss, or a business failure in normal economic times.

There are two features of the general approach that cut across the particularities of the models. First, they are concerned with mapping economy-wide developments on to the conditions of individuals and households. Second, they seek to be practically, and politically, relevant—that is to provide information to policy makers and interest groups in time to shape policies.

These two considerations drive the main design choice of developing models that link macroeconomic or sectoral developments to the characteristics of individuals and households, via existing labor market or household surveys, and then develop a capacity to simulate alternative scenarios. This is often called a microsimulation approach. Linking economy-wide developments to households (and firms) is an obvious requirement. The use of simulations flows from the typical absence of up-to-date information on outcomes. And the link to households and firms is essential to assess impacts and responses, and also, if less obviously, to the interpretation of political economy.

This approach is in contrast to one that relies primarily on gathering real information on actual impacts and responses. While the two approaches are obviously complementary, the whole point of undertaking a structured, microsimulation approach is to provide information that is both sufficiently timely to be of practical relevance and hope-fully to be politically salient.
The approach has one enormous strength: it allows systematic, illustrative exploration of alternative policy choices—or indeed alternative views on the behavior of different actors. These can be developed for policy makers as they assess what to do. This work can be undertaken by a ministry’s technical staff or by an external actor, such as a domestic think tank or the World Bank.

But the approach also has a potentially large weakness: it may get responses wrong, and deliver misleading results. We are dealing with highly complex systems. As noted above, it is hard enough to model responses to shocks in the macroeconomy. When the task is to include the behavioral responses of the large, heterogeneous range of household and firm actors in a society, the systemic effects may be of bewildering complexity.

The main response to the systemic challenge is to choose to analyze partial equilibrium effects on part of the system—for example, on household consumption or unemployment, and often limit this to first-round impact effects. This is good for tractability and transparency: it is relatively easy to understand what is going on, and this is surely better than a modeling approach that adds more complexity but becomes a black box, obfuscating rather than improving the informational basis of policy and public debate. But the nature of second-round and systemic effects cannot be ignored. This includes the potential behavioral response of one of the most important actors—the government—and so inevitably gets into political economy.

The remainder of this comment has two themes. First, that second-round and systemic effects can be of major, and sometimes first-order, significance to technical and political economy analysis. And second, that it is important to have an explicit view on what might be termed the practical political economy of information—that is on how information, in this case from analysis and modeling, can lead to changes in public action.

**When Are Second-Round and Systemic Effects a First-Order Concern?**

An ex ante, first-round, empirically informed impact analysis of the effects of shocks on part of the households and firm system clearly contributes to the interpretation of the consequences of crises. As several studies (including those described in Chapter 1) illustrate, this type of analysis suggests distribution matters (in the sense that impacts vary across households), that effects can differ from initial intuitions (so the complexity of the modeling adds something), and that these potentially make a difference for policy choice (see Ajwad et al., 2010, Ferreira et al., 2010, Habib et al., 2010)

So far, so good. But are there conditions in which a first-round impact analysis is sufficiently incomplete or misleading to make a large difference to both interpretation and policy? There are a number of reasons for thinking this could often be the case. To fully work through this would require a careful comparison between an ex ante modeling analysis and ex post experiences. That is not done here—though it would surely be valuable to do so in the future. So the argument is suggestive.

It is useful to distinguish two kinds of reasons: second-round effects; and things happening in response to a shock outside the part of the system being analyzed.

**Second-Round Effects**

Here I give illustrations of three areas associated with household responses in response to changes in market conditions after a shock.
(A) Household Consumption

The first point is obvious: households respond to changes in prices of goods by changing consumption patterns. Is this sufficiently large and heterogeneous enough to be practically important? There are at least indications that this can be the case. A survey of Turkish households found that almost three quarters shifted consumption patterns into cheaper items (see Chapter 3). For an illustrative systematic analysis of what this kind of response means in welfare terms, Friedman and Levinsohn (2002) use an ex ante modeling of the welfare impact of food price changes in the Indonesian crisis using empirically estimated substitution effects and an approximation of welfare effects. This found that the welfare impact—as measured by the compensating variation—compared with no substitution is substantial. Estimated total welfare losses decline by between a third and a half across the household distribution compared with a scenario of no substitution, with larger reductions in urban than rural areas, and in the middle of the rural distribution of expenditure (see Figure 2.1).

As this analysis is also ex ante, it is only illustrative. Moreover, since it is based on an econometric analysis of substitution effects, it almost certainly underestimates heterogeneity across households driven by interactions between household preferences, needs,
and local market conditions. Thicker local markets for consumption goods will allow more opportunities for substitution, and potentially less extreme price effects, especially when thinner local markets lead to local hoarding or exploitation of scarcity by traders with market power.

For policy purposes the issue of heterogeneity will often be more important than getting better estimates of the size of effects. In the wake of a crisis, we want to know if adverse effects are “large” or “small”—and the mitigating influence of substitution itself is unlikely to influence this assessment. But getting a good enough grip on who is suffering most does matter, and can be relevant to policy design and modeling strategy.

(b) Labor Market Responses

A lot of the action in response to shocks happens in the labor market. Here too specific mechanisms matter. Again the structure of the issue is how individuals in households behave in response to potential changes in labor market functioning.

How firms and firm-households respond to a shock determines the labor market opportunities available to households. In effectively all developing countries, employment is distributed between formal and informal sectors. Formal firms may respond by reducing wages, reducing profits, reducing hours worked, or laying off workers, depending on expectations of the length of the shock, the potential to reduce wages and the cost of firing. This can make a large difference to implications for worker-households. High levels of layoffs both have the sharpest effect on those who lose their work and put additional pressure on the informal labor market.

Furthermore, different labor markets have different closures. This is partly influenced by the degree of flexibility of formal work, but of equal or greater importance are options for informal work. In Latin America, for example, the labor markets of Argentina and Chile have typically closed with higher levels of open unemployment, while those of Mexico and Peru—and to some extent Brazil—in lower earnings. Elsewhere, in South Africa the labor market primarily closes in higher open unemployment, while in Indonesia and India it closes mainly in shifts into lower paying informal work.

Then the response of households matters. In Indonesia and Thailand, there was reported to be significant reverse migration to rural areas after the 2007/08 crisis, in response to sharp falls in employment opportunities in urban areas. An informal survey by the Self-Employed Women’s Association of India in 2009 also found many of their members were moving back to villages, especially in Gujarat (that has a high level of connection to export markets). Labor reallocations also occur within households—for example with women or children increasing their labor force participation to compensate for lost income from declining wages or work of primary wage-earners.

The pattern of changes in the labor market can again make significant differences to the size of welfare effects, and, more important, these can be heterogeneous across households, depending, in these examples, on connections to rural areas, and the potential to increase household labor supply.

(c) Behavior Affecting Asset Changes

A third category of response concerns assets. It is both a standard part of economic analysis, and generally observed, that households respond to a shock by changes in their asset position. This can involve drawing down financial savings, selling cattle, gold, or other physical assets, or borrowing. Or it can involve changes in human asset accumula-
tion, for example by taking children out of school (to save on fees or put them into work) or postponing health-related spending. The last may be exacerbated for those who lose job-related health insurance.

There is evidence that this is significant. As Leipziger reports in Chapter 3, according to Crisis Response Surveys conducted by the World Bank's Europe and Central Asia group, 29 percent of Turkish households in the bottom quintile postponed health spending, and 14 percent reduced education spending. In Armenia in the bottom quintile, almost 60 percent of households stopped visiting health centers or purchasing medicine (World Bank, 2010a). However, it is not necessarily the case that children shift into work—Schady (2004) found that school attendance actually rose in response to severe economic crises in Peru, which the author interpreted as a response to a fall in work opportunities for children.

Drawing down on assets or postponing investments can be an efficient response to an adverse shock for a household. However there are two issues of concern for interpretation and policy. First, there is likely to again be substantial heterogeneity, depending on initial assets, financial savings, social connections, forms of finance for education and health, and so forth. Local market and community conditions matter, especially as we are concerned here with covariate shocks—prices of some assets (cattle for instance) fall if many households are selling, and opportunities for borrowing or other support also diminish when many are hurt. Second, there is the possibility of persistent effects, which are of particular concern if they affect human capital, whether of children or adults.

System-Wide Factors beyond Households

Since the immediate concern is with the distributional effects on households, there is a tendency to focus analysis on patterns of impacts in the household sector. Yet this may miss the big action in loss allocations across groups in response to a shock. This is particularly important where the shock involves the nexus of financial, macroeconomic, and corporate sector interactions. Analyzing specific distributional effects across the distribution from data available in surveys could be second-order relative to the distribution between holders of financial assets and others, and fiscal action to support the financial-corporate sector.

Take the characteristic sequence of emerging market crises. As awareness of the impending crisis spreads, holders of financial assets start moving out of domestic currencies and the domestic financial system. Typically those with larger holdings—and so more information and international financial connectivity—move earlier. Figure 2.2 illustrates for the lead up to the Argentine crisis: in December 2000 to March 2001, domestic assets below US$100,000 were actually rising, while larger holdings and foreign asset holders were already moving their money out. As expectations of a collapse—and the likely abandonment of the peso-dollar peg—became widespread, shifts out of peso assets spread down the size distribution, but the proportional change in larger and foreign-owned assets remained much higher. The aggregate effect was of large-scale capital flight, of some US$13 billion between the end of 2000 and the first quarter of 2002: the peg was indeed abandoned in January 2002, and the peso lost 75 percent of its value in a few months. The smaller depositors who had shifted into domestic dollar assets (Figure 2.2) meanwhile suffered an effective expropriation, as their deposits were converted into pesos at the old 1:1 exchange rate. Those who got their money out actually experienced capital gains with respect to Argentine assets.
Now this is only the beginning of the story in financial crises. Since the financial system is both central to economic functioning and generally carries substantial political influence, it typically becomes the recipient of large-scale government support, in the form of protection for deposit holders and bailouts. Fiscal and quasi-fiscal costs have been estimated at 19 percent of GDP for the Mexican 1994–96 crisis, 26 percent of GDP for the Republic of Korea, and 50 percent of GDP for Indonesia in the wake of the 1997–98 East Asian crisis (Honohan and Klingebiel, 2000). This comes at the cost of higher future taxes or lower expenditures, and so involves an intertemporal transfer. But it also has distributional effects across households, since the beneficiaries are those within the financial system (and in some egregious cases even the equity holders of banks) that typically exclude much of the population in a developing country. Moreover, where spending is

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Source: Central Bank of Argentina, as calculated and presented in Halac and Schmukler (2004).

Note: The figure shows the cumulative percent change in peso and dollar private time deposits by residence and size of deposit for the periods December 2000 to March 2001 and December 2000 to November 2001. The dollar sign ($) stands for both U.S. dollars and Argentine pesos, as the exchange rate was still one peso per dollar.
on an increasingly progressive path, as it was in Latin America in the 1990s and 2000s, the foregone spending has an additional regressive impact.

A final issue concerns wage and profit shares. There is some evidence that crises are associated with reductions in wage shares (Diwan, 2001). Indeed, Diwan suggests that crises work as a mechanism for resolution of distributional fights when mechanisms in normal economic times prove inadequate. A crisis forces a loss allocation process that often hurts labor incomes disproportionately. Most household surveys only capture labor incomes—or the consumption of households whose dominant source of income is from labor or the returns from self-employed activities—and so misses this action.

**Implications**

What do these comments imply? Of course the world is more complex than can be captured in any modeling approach. The point is not to seek an ever-more complicated model—that comes at the cost of tractability and, even more important, transparency. However, I think there are three implications for the design and use of models, all of which go in the direction of pragmatic completeness.

i. It will often be important to place specific modeling of part of the socio-economic system in the broader context of both system functioning and responses. This will frequently have to be somewhat ad hoc, in the sense of linking household impacts of a change in price or employment conditions to what is happening in the overall drivers and responses of the crisis—as illustrated for the financial-fiscal responses to emerging market financial cries. This assumes the goal is to assess overall distributional effects of a crisis, as I believe should be part of any technical input to crisis analysis. Sometimes, of course, the goal may be narrower; for example, comparing alternative instruments to reach a more specific objective, such as introducing price subsidies versus public works, or calculating the likely impact of specific policy interventions.

ii. In modeling strategy there may be opportunities to explore particular aspects of heterogeneity and market context through imposition of alternative closures or potential responses. I have not worked through this in detail, but here are here a couple of intuitive examples. Alternative labor market closures could be explored both with respect to the extent to which firms lay off workers, as opposed to cutting hours and wages, and in terms of whether laid off workers lead to higher open unemployment or reduced labor incomes in the informal sector. And second-round household responses could be explored, in terms of consumption, household labor allocation, and asset responses.

iii. The issue of the actual heterogeneity in impacts and responses should clearly also be explored empirically. In particular this suggests high priority for looking at historical episodes, in addition to new quick surveys (see World Bank, 2010a and 2010b). In either case the question is more about exploring any variation around an estimated pattern, and seeing if this is related to any observables, or not.

These considerations matter because they have a bearing on the interpretation of effects of shocks, with potentially large implications for policy. Each of the areas reviewed has potential consequences for policy. Where there is unknown heterogeneity in house-
When Can Information Affect Government Behavior?

When can the results of modeling—or indeed any analysis—affect government behavior? This is central to the approach under discussion here, since it is fundamentally motivated by the goal of achieving better outcomes for society in the wake of shocks. It is not an academic exercise. So we are deeply within the domain of the role of information in real decision-making, as it interacts with “technocratic” and political economy processes. Practical technical analysis often has an implicit theory of change, and of how information influences this. I think it is important to make this explicit.

Consider two kinds of case: where analysis can play a role under conditions of technocratic space, and where interests determine policy but information may influence political economy outcomes.

Technocratic Space

The implicit, or explicit, theory in much of the work here is of the political salience of well-intentioned technocrats—a view that has pervaded much development policy advice for decades. A strong version of this assumes the social welfare function of the government is aligned with the analyst, but policy makers lack information on how to achieve this. Suppose a government genuinely wants to provide support to those hurt most by a crisis. This will be some function of the interaction between the size of household-specific shocks and their initial level of deprivation. Then an empirically informed modeling approach—and even more one that embeds specific model-driven analysis with a pragmatic treatment of systemic and second-round effects—can both provide critical information on who should be targeted and on the likely efficacy of different policy instruments.

This view of the world may seem far from the reality of real government objectives, influences, and political constraints. However, a weaker requirement is that some segment of policy making has these technocratic characteristics. Perhaps a government is going to bail out rich bankers in any case, but still wants to allocate some resources to compensate middle and poor households, and has a technocratic group with the mandate to design an implementable approach.

Even in this technocratic case, I believe the analysis should go beyond the purely technical. In particular it is valuable to make explicit the information-based theory of change, and assess its realism. Here are three aspects of this.

i. Specific goals. What specific goals underpin the technocratic space? If they are really to support a particular support base (laid-off formal workers, existing
Knowing, When You Do Not Know 39

patronage networks in poor areas) that may differ from a more general, distributionally weighted, social welfare function. At a more technical level, the above phrase that weights will be “some function of the interaction between the size of household-specific shocks and their initial level of deprivation” requires resolution in the context of local social and political priorities.

ii. Administrative feasibility. The feasibility, leakage, scope for corruption and likelihood of local capture will both vary substantially across programs, and be quite context-specific.

iii. Political constraints. Even a technical analysis needs to take account of political constraints—indeed, the more these are incorporated, the more useful will the technical analysis be.

Technical analysis, and exploration of optimal responses, can feed directly into policy design in cases of technocratic space, but even here supposedly “non-technical” considerations also intrude.

Information and the Political Economy of Interests

A second category concerns the (more realistic) case in which political and economic interests are salient, and differ in the structure of influence from the social welfare function of the analyst. Here the role of information, and modeling or other analysis, is different: it is about changing the political dynamic. And this requires a different theory on the role of information.

Two things are likely to be useful here.

First, to be relevant, analysis needs to map on to politically relevant interest groups. Doing this systematically can itself be a useful exercise. In rich and poor societies alike, narratives over the beneficiaries of policy choices often have a weak relationship to reality. In the United States there seems to be some obfuscation over who benefited from tax cuts in the early 2000s: the discourse of “middle class” tax cuts hides the fact that the primary beneficiaries were the truly rich. In developing countries formal industrial workers and public school teachers—in Mexico and India for example—are often characterized as being amongst the relatively deprived. That may be true relative to the rich, but not to the bulk of the population. As a final example, and as the discussion above illustrates, it is important to bring in analysis of impacts on profits and holders of financial assets into an integrated analysis.

Second, it is useful to have an explicit account, or theory, of how new information may influence political dynamics. This could work, for example, via the accountability of politicians in a democracy: politicians depend, if via multiple and murky routes, on support from the electorate. Better information on the likely effects of policies could provide incentives for different behavior—for example, to provide more support for budgets and designs that favor more deprived groups hurt by a crisis. Now this also requires a strategy for making the new information salient, for example via civil society, parliament, and media.

The theory and empirics of such channels of influence are an ongoing area of research: for example Besley and Burgess (2002) provide an example of an empirical study that finds that local newspaper density increases the responsiveness of local governments to shocks. The point here is to explore hypotheses on how information can make a difference and explicitly introduce this into practical designs and experiments. Where
we are dealing with economy-wide shock this will typically not be via experiments using randomized controls trials (see Banerjee et al., 2009, for an example of the impact of information on voting). But making explicit the hypothesized channels and influence, and systematically tracking changes is still feasible.

Conclusion and a Note on the World Bank

The systematic analysis of the effects of shocks across households is of huge interest and importance. An ex ante modeling approach, linking historical household information to macroeconomic and sectoral analyses of the structure and dynamics the shock makes a lot of sense, precisely because information on actual impacts typically comes with a lag—and too late for timely policy responses. The methodology outlined in Chapter 1 is a valuable addition to this approach. This note has offered two kinds of comments on the approach.

First, I have highlighted the potential importance of both second-round effects and changes in parts of the socioeconomic system that fall outside the domain of the model. These may be large enough to substantially change the interpretation of aggregate loss allocations and the distributional pattern of vulnerability. How to deal with this will vary from case to case, and can range from incorporation of second-round effects into a model estimated from historical information, exploration of how alternative assumptions on firm behavior or labor market closure affect simulations, or ensuring any analysis takes at least ad hoc account of responses elsewhere—especially in the financial-corporate-fiscal nexus. This can all make a difference to policy—either in choices over specific sectoral designs (for example, in labor market, education or financial bailout designs), or in shifting the emphasis to self-targeting mechanisms and an array of instruments to reach heterogeneous households.

Second, I have argued that technical analysis of the impact of shocks would benefit from an explicit theory of how new information can make a difference in the specific political economy of the case at hand. Sometimes a modeling approach will seamlessly feed into a situation of technocratic space. Even here considerations of administrative feasibility of alternative policy designs, and indeed political constraints, would be of value. More generally, the approach could be useful structured into hypotheses on the political economy of information, hypotheses that can be then assessed against the use of modeling results—even when the intrinsically economy-wide features of aggregate shocks preclude rigorous causal testing.

A final question concerns the role of the World Bank—since this work was sponsored by the World Bank. Does this make sense? The general answer is absolutely yes: the World Bank has technical expertise, and can in particular support the internalization of externalities inherent in the development of technical approaches that are applicable to many country settings, as well as facilitating cross-country learning. These issues form part of the overall question of the political economy of information, and the comment on making implicit theories of how information affects change applies with force to World Bank analysis. Over time, the goal should be to both ensure useful technical approaches are adopted in countries, in governments, think tanks and universities, and to support direct communication across countries.

There is, however, one apparent puzzle. The standard advice on the management of shocks is to prepare for them in normal times. Analysis and action after a shock hits
is likely to be late, fuzzy and (for policy) particularly susceptible to immediate political influences. Yet the World Bank has been deeply engaged with the kinds of issues thrown up the recent shocks in many previous episodes of shocks. Furthermore, the technique of linking economy-wide changes to micro distributional analysis has been around for many years, with World Bank research an important contributor to the approach (see Bourguignon et al., 2004). So why didn’t the World Bank itself invest in this kind of approach in normal times, so that analyses could be quickly run out when new shocks arrive? I think the answer lies with internal incentives and pressures. Countries find it hard to develop policy instruments in “normal” times that can swiftly, or endogenously, kick in when shocks occur. Similarly, World Bank policy analysis concentrates on non-shock issues outside crisis periods. Of course real choices have to be made in relation to pressing priorities. A potential solution involves exploring technical approaches that are of value both in interpretation and policy design in “normal” times and in response to major shocks. The question of the distributional effects of economy-wide or sectoral developments have particular urgency when there are large, adverse shocks, but are just as important for the analysis of slower-moving developments or the assessment of idiosyncratic shocks.
Backdrop to the Issue of Distributional Consequences

In examining the impact of the recent economic and financial crisis on different segments of the population, it is useful to start off with what we think we know, which is that the distributional impacts of crises are generally regressive. Why? Because poor people tend to have less savings. In the crisis of 2008–10, we can easily overlook distributional or microeconomic issues because the macroeconomic dilemmas are so stark and outlook generally so worrisome. But this would be a mistake, since the impacts felt by different parts of society are highly uneven and the measures governments have in place to deal with distress are so imperfect.

The overall drop in national income and wealth in many parts of the developed world has been acute. Joblessness has dramatically increased and is slow to recover. The confluence of collapses in the markets for housing and the rest of the real economy combined with shocks to equity markets and accompanying banking problems are events not witnessed since the Great Depression. As a result, policy makers have been scrambling to find solutions and to rebuild confidence. This has put the spotlight on the big picture, perhaps to the detriment of impacts on individual households and firms.

Thinking about the Problem

Government policies can be either progressive or regressive, based on who pays and who benefits. Some examples of progressive policies are unemployment insurance or targeted social programs; programs that we may think of as regressive include bank bailouts and other financial sector interventions that are of a systemic nature. The notion of an entity “too big to fail” being saved by taxpayers sounds somewhat regressive in nature.

My main point is that the impact on income distribution of a financial crisis depends largely on the preexisting distribution. Everybody loses, but some lose more than others. I am going to focus in the first instance on the United States. The reader may legitimately wonder why we should worry about the United States, and what we have to learn from the U.S. experience. I argue that, first of all, the United States still constitutes 25 percent of global GDP, and what happens in the United States in terms of consumption, imports
and global investment has a major global impact. Secondly, of course, it gives us clues
to what will happen potentially in other countries, particularly those with a burgeoning
middle class. Third, a look at the United States can help shape the research agenda and
give us some lessons on the incidence of public policy. And finally, what happens in the
United States has an effect on the future face of globalization, and the worse the impact,
the less likely we are to return to the pre-crisis trajectory in terms of globalization.

The Guts of the U.S. Story

Let’s take a look at what has happened to income concentration in the United States
over the past century. Based on work by Piketty and Saez (2003), as reported in the
Vice President’s Task Force on the Middle Class (February 2010), we have the chance to
examine the income of the top one percent of U.S. families over a long period of time. Between 1978 and the pre-crisis year of 2007, the top one percent of families went from
commanding 9 percent of total U.S. income to controlling 23.5 percent of income (Figure
3.1). If you want to run for office in the United States and the people voting understand
graphs, I would go with this graph above anything else. It reveals a shockingly uneven
distribution of income before the crisis.

Putting the pattern in some historical perspective, the data reveal that the Gini coef-
ficient has worsened over the last 20 years and that real incomes fell even compared to a
previous period of the 1960s and 1970s. More remarkably, average incomes fell during
the boom period of 2000 to 2008, during which everybody was supposedly doing well. However, it seems that not everybody was doing quite so well. Apropos Figure 3.1, the

![Figure 3.1: The top percentile (1%) of U.S. income (incomes above US$368,000
in 2008)](image)

Note: Income is defined as market income including capital gains.
last time we saw as concentrated a distribution of income in the upper one percent of the population was in 1928, a year before the Great Depression. If you look at it by quintile, you see that everybody was losing except the uppermost quintile. That is also misleading in a way because within that upper 20 percent it is really the top 5 percent that were doing the best, since 95 percent of American wage earners lost ground in the last 20 years.

Now let’s shift the microscope from income to wealth. There is no Horatio Alger-style rags to riches story to be found here, because actually the mean-to-median wealth measure, as reported by Kennickell of the Federal Reserve Board (2009), has increased over time. The bottom line is that in terms of net wealth, the picture has turned more uneven. In 2007, the wealthiest one percent of Americans owned 34 percent of family wealth and the next 9 percent owned 37 percent. In other words, the richest decile of the distribution owns 71 percent of national private individual wealth, and that was before the crisis.

So when I say that Joe Six Pack runs dry, it basically means that before the crisis you see declines in wealth in deciles five through nine, while the top decile gains. You also see that for most of the middle class, let’s say deciles five through nine and a half, most of their wealth—55 percent of it in fact—is in housing. Now let’s add to that what we know about the housing market collapse in the United States, where housing prices fell according to the Case-Shiller Index by 20 percent between 2004 and 2007, and another 20 percent in the subsequent two years, 2008–09. This is not good news for working class Americans. These patterns are clearly seen in Figure 3.2, which shows the Lorenz curves for the United States with respect to income and wealth.

**Figure 3.2: U.S. Lorenz curves for total family income and net worth**

![Lorenz curves for total family income and net worth](Source: Kennickel (2009).)


So this is the pre-crisis situation for income and for wealth. If we were to redraw them, particularly on the wealth side, and say that the middle class lost 40 percent of its housing worth and 50 percent of stock markets value, and these two make up the bulk of net worth of the households, except for the upper five percent, this would show a much more uneven distribution of wealth post-crisis. This is an easy simulation to do. Based on household balance sheets as reported by Kinneke, we know that roughly 85 percent of household wealth for the core of the distribution is in housing and financial assets, and we know that their balance sheets suffered a major decline.

Some Basic Generalizations

Although there are significant differences between the United States and other countries, there are some major similarities as well. What are the similarities between looking at OECD countries or the United States and developing or emerging market economies? First, we know from the work of Narayan and Petesch (2007) and others that there is an equivalent movement in and out of poverty in both rich and poor countries. Movement into poverty usually coincides with the occurrence of multiple disadvantageous events; in the case of the United States and other OECD countries, these misfortunes included the housing market, the stock market, and employment collapsing at the same time. We know that public policies in many developed countries are just as poor as in many developing and emerging economies in terms of sheltering these income declines. The one place that seems to be better at cushioning declines is Europe, where safety nets are more extensive.

We also know that public expectations of what people want from government exceed what governments can do, and at the end of the day it is households that have to cope, often with devastating effect. So why are governments so inept at aiding households during a crisis? There are a few possible explanations. One is that governments are fixated on the big picture—on financial bailouts, for example—or on protecting the fixed exchange rate regime, as in the case of Greece. Second is that targeting mechanisms may not be sufficiently in place beforehand and that governments are ill-equipped in a crisis to undertake the kind of means testing that is ideally required. The third is that resources are scarce. Tax revenues tend to decline in a big recession. Expenditures, ironically, are often regressive for a lot of goods, even merit goods (see Goldstein and Estache, 2009). Constituencies are not particularly strong for the middle class (see Estache and Leipziger, 2009) and certainly not for the lower end of the distribution. Moreover, even when there are viable public options, governments may be myopic in their decision-making, in part because fiscal accounts are stressed and the political discount rate is very high.

The Current Crisis in Perspective

What is new in the transmission channel of this particular crisis? One unique factor was that trade finance was affected, which was unusual. Remittances have dropped more than one would expect, and we have seen that in some countries, such as Bangladesh, this had a big impact. External financing by banks has cut off and credit was affected. Even creditworthy borrowers, such as Korea, lost about half of their normal rollovers at the beginning of the financial collapse. Korea is experiencing the V-shaped recovery that all aspire to and is managing well, but it just shows how severe the upheaval was, and
how dramatically capital flows dried up. This had serious potential consequences for firms, and in many emerging economies, public sector banks had to come to the rescue of firms who could not access their normal international sources of credit.

If this happens at the aggregate level, what happens at the household level? That is the focus of Chapter 1. It seems to me that the regional differences do occur with respect to what expenditures get cut first, whether it’s consumption or educations or health. But household coping mechanisms involve reduced spending, and the primary development issue is to trace the long-lasting impact of these coping mechanisms and also their infra-familial pattern.

Of course, the level of development matters. Normally, one might say that female labor force participation can be a buffer, and we have seen in previous crises in Argentina and other places where labor force participation rates for women suddenly rose. The trouble is in a globalized downturn like the one recently experienced, it’s not a question of joining labor force; it’s a question of who gets sacked first!

Household decisions on health and education obviously can have long-term effects if they are not mitigated, and assistance is often faulty, particularly in a synchronized, global downturn where fiscal resources are scarce and where the focus on the narrowly-defined poor may not be the right policy. In this respect, Ravi Kanbur, who has written on this, is correct (Kanbur, 2010). I think the leaky bucket analogy is more relevant in a large, systemic crisis than it is normally—better to imperfectly target than not to act, especially given the linkages between earnings, consumption, and employment.

Results of Quick Post Crisis Surveys

We can learn quite a bit from the quick response surveys conducted by the Eastern Europe and Central Asia (ECA) Region of the World Bank. In Turkey, for example, most of the response to lower incomes is borne on the food side, where substitution or reduction of foods seems to be the most immediate coping mechanism (Figure 3.3). The pecking order in terms of what gets cut seems to be food and then health services and then education, with the adjustments being predictably sharpest for the poorest. Additional insights can be gleaned from the labor market in Turkey, where most of the job losses are in the informal sector, more urban than rural (World Bank, 2010a).

![Figure 3.3: Household coping strategies in Turkey (survey responses)](image)

Data from Turkey also suggest an important and somewhat staggering phenomenon, namely, the acquisition of new household debt. Quintiles two and three have debt levels that are equivalent to two-thirds their level of income. This is a huge rise in household indebtedness, which will have a potentially devastating long-term impact. As a coping mechanism, only middle-income households have access to credit of this kind. However, should interest rates rise, which is not unforeseen, the results could be quite devastating.

In the case of Armenia (World Bank, 2010b), one sees that health expenditures are cut ahead of food consumption (Figures 3.4a and 3.4b). So, apropos my point regarding the importance of country patterns, there is some variation even among the ECA cases studied in terms of what gets cut more.1

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**Figure 3.4a: Coping strategies in Armenia by asset quintile**

![Coping strategies in Armenia by asset quintile](image)

*Source: World Bank (2010b).*

**Figure 3.4b: Coping strategy survey responses**

<table>
<thead>
<tr>
<th>Coping Strategy</th>
<th>Percent of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased the use of entertainment services</td>
<td>64.1</td>
</tr>
<tr>
<td>Decreased social outings with friends</td>
<td>58.6</td>
</tr>
<tr>
<td>Substituted to cheaper food items</td>
<td>58.3</td>
</tr>
<tr>
<td>Reduced or stopped visits to healthcare centers</td>
<td>47.2</td>
</tr>
<tr>
<td>Reduced or stopped buying medicines</td>
<td>41.2</td>
</tr>
<tr>
<td>Decreased food consumption</td>
<td>41.1</td>
</tr>
<tr>
<td>Stopped buying some non-food items</td>
<td>40.0</td>
</tr>
<tr>
<td>Increased the use of public transportation or walking</td>
<td>32.8</td>
</tr>
<tr>
<td>Started working odd jobs</td>
<td>12.6</td>
</tr>
<tr>
<td>Increased production of food for own consumption</td>
<td>11.4</td>
</tr>
<tr>
<td>Sent a member of household to find seasonal employment</td>
<td>9.9</td>
</tr>
<tr>
<td>Started buying second hand items</td>
<td>9.1</td>
</tr>
<tr>
<td>Withdrew/postponed admission to school, college, or kindergarten</td>
<td>2.1</td>
</tr>
<tr>
<td>Took one or more children out of school</td>
<td>0.6</td>
</tr>
</tbody>
</table>

*Source: World Bank (2010b).*
Coming back to the more advanced economies—as well as for the middle class in emerging and developing countries—the main objective to enable households to ride out the storm revolves around trying to maintain employment. Regrettably, we seem to have relatively few policy instruments available to encourage this. The evidence on fiscal incentives in the face of dramatic downturns is not encouraging, and only where work-sharing agreements were already in place was government able to induce the private sector to hold on to employees. In East Asia, the cushioning expenditures of government were very good, but that is because they had very strong fiscal accounts going into the crisis.

**Takeaway Observations of Relevance for Policy**

There are some lessons that we can take away from the current crisis and a quick examination of public policy responses:

First, if governments do not have pro-equity policies in place prior to the crisis, they will likely be unable to prevent a sharp income decline for the non-rich during a crisis. Put differently, a concern for equity must precede the crisis, both because the crisis will exacerbate existing inequality and because the political economy issues involved in protecting the less well off will not receive sufficient support in a crisis where all are losing absolutely.

Second, there are some incentive-compatible options available to policy makers, but like the issue of counter-cyclical fiscal rules, they are difficult to initiate in the middle of a crisis. This applies to work-sharing agreements, for example, which tended to work pretty well in Germany and other places, but are difficult to start when the government is already in a crisis.

Third, economic crises are not gender neutral, with the prevailing rule often being “last in–first out.” Some hard-won gains for women can easily be lost in a crisis. Even in the advanced countries, there is some misguided support for the view that male jobs should be protected ahead of female employment.

Fourth, the pre-crisis fiscal situation largely determines the government’s room to maneuver. If we compare experiences and look at China or Korea, they executed perfect counter-cyclical policies, stimulating domestic demands to substitute for exports. But they were able to do this because they had the fiscal capacity.

Fifth, it is crucial that public policies assess and integrate long-term costs and benefits. The costs of interrupted education, joblessness, or loss of home ownership are all very hard to reverse. A comprehensive general equilibrium model incorporating all the costs might induce governments to spend to prevent certain outcomes; frankly, however, that’s not usually the way decisions are made, least of all in a crisis.

Next, I would be very careful about the second-round effects, particularly on household indebtedness. I argue this because all the countries that have taken on additional debt will eventually experience higher interest rates—just imagine the impact on households that have indebted themselves as a coping strategy. This could well be a time bomb waiting to affect the middle class in emerging market economies.

Seventh, I would say that it is hard to initiate brand new safety nets during a crisis; therefore, it is important to use existing mechanisms, even if they are imperfect.

Next, I offer the obvious comment that governments are normally important (see Growth Commission, 2008) but that they are indispensable in a crisis of confidence in
which many markets are affected. More importantly, it seems that the public expects governments to act as a cushion in a crisis, regardless of ideology beforehand or sterile arguments over the appropriate size of government.

Ninth, I would argue that governments should resist the temptation to increase program coverage that may later prove hard to reverse. I would also be inclined, if policymakers are going to increase safety nets, to issue a second check, just to differentiate it from the first, and I wouldn’t put people permanently into the recipient category, because it seems to be difficult to get people off of it.

Lastly, it is important to do incidence analysis at all times, and hopefully prior to the crisis. In a systemic and brutal crisis, such as 2008–10, however, if you remember that in a fire, it’s better to have a leaky bucket than none at all, it may be tolerable to mistarget a bit. If it is necessary to cover some people under the safety net umbrella who may not belong there ideally, the externalities associated with a major crisis may validate this course of action.

Notes

1. For more ECA country cases, see World Bank (2011).
CHAPTER 4

Stress Testing for the Poverty Impacts of the Next Crisis

Ravi Kanbur

Introduction

In a presentation to the World Bank’s Executive Board in July 2009, at the height of the present global financial crisis, I argued that we have to prepare ourselves for the next crisis and its impact on the poor, even though we do not know when the next crisis will strike and what its precise impacts will be (see Kanbur 2009a, Kanbur 2009b, and Kanbur 2010). I proposed three stages of systematic preparation at the country level. First, a program of assessment, which “stress tests” the social protection system against a range of crises, to identify gaps and weaknesses, analogous to the role that the Financial Sector Assessment Program plays in stress testing the financial system. Second, a medium-term program of financing improvements in social protection programs, now viewed as a system, to close gaps and address weaknesses. Third, a pre-qualified line of assistance for social protection, which would be available to a country immediately when previously agreed upon crisis triggers are breached.

These three steps are somewhat different in nature and require different types of fora for discussion and debate. The third step has to be formulated in the context of overall development financing, and indeed a permanent “Crisis Response Window” was discussed in the context of the IDA16 replenishment. The second step comes close to “normal business” for donor agencies, although there are issues about the extent to which funding of precautionary investments, for a crisis sometime in the future, will be attractive (to donors and recipients) relative to expenditures with immediate impact. However, both of these steps build upon, and depend upon, the first step: a solid assessment of how the collection of social protection programs as currently constituted would or would not respond to protect the poor in the face of a range of crises. The set of papers presented at the World Bank workshop on simulating the impacts of crisis is an excellent contribution to this effort. In this note I will briefly discuss why the effort is important, and then consider some of the specifics of the analysis.

The Need for a Social Protection Assessment Program (SPAP)

The present global financial crisis will pass. But crises are here to stay. By a crisis I mean a macro-level shock over which the country itself has no control, but which affects economic wellbeing in the country. A crisis worth the label will have a dramatic negative impact on per capita income. But the precise impact on the pattern of incomes and well-
being will depend on the precise origin and nature of the crisis. Developing countries are likely to face many such sources—natural climatic disasters, sudden emergence and spread of an infectious disease, unrest in a neighboring country with possible flow of refugees, collapse of demand in a particular industry (such as tourism as a result of real or perceived terrorism threats, or sudden shifts in fashion in apparel), or the consequences of a global financial crisis. Each of these headings in turn covers many specific possibilities. For example, the financial crisis of 1997 is recognized to have been quite different in nature and impact from the crisis that began in 2007–08. Furthermore, for a given country, particularly a small country, a global crisis can have very different impact depending on the (unpredictable) reactions of its large neighbors or trading partners.

Each of the different types of crises will have very different types of impact on the poor in different countries, depending again on the details of economic structure in that country. Added to the uncertainty of crisis type is uncertainty of crisis timing—timing of the onset of the crisis, and timing of when it recedes (the latter depending on uncertain policy responses).

I have argued that these twin uncertainties—of crisis type and crisis timing—should frame the development of an ex ante strategy for protecting the poor. We should examine how the current social protection programs, viewed as a system, would respond to the needs created by crises of different types. We should “stress test” the system to identify vulnerabilities and gaps in (i) coverage and (ii) flexibility and speed of response. Such a comprehensive assessment would be a Social Protection Assessment Program (SPAP), corresponding to the Financial Sector Assessment Program (FSAP). I would now like to review the workshop presentations with this objective in mind.

**An Overview of the Workshop Papers and Presentations**

The papers and presentations at the World Bank Workshop on Distributional Impacts of the Crisis represent an important contribution to our understanding of crises, their impacts on the poor, and how social protection programs can and have responded. Chapter 1 in this volume summarizes the overall approach described there.

The first step is to model the crisis itself and its macro impacts on the economy. This requires a careful enumeration, elaboration, and discussion of the transmission mechanisms. The exercise has to be country specific, and will involve a fair amount of judgment, for example on assumptions made about near neighbors’ policy responses, which in turn can influence macro outcomes for the country. From these would come various macroeconomic projections—overall and sectoral growth, inflation in general and in its major components such as food and fuel, exchange rate, international remittances, and so forth Building on these would come projections of employment and unemployment. A key method for translating these macro projections to the household level are estimated models of labor force status and Mincerian wage equations, and assumptions that allocate international and domestic remittances across households.

With the above procedure and a base household survey, one can project the distributional impact of the crisis being modeled. Poverty calculations can then be done assuming that the expenditure-to-income ratio stays constant. Impacts across the distribution can be shown using growth incidence curves and other methods. Who is likely to become poor, in terms of household characteristics, can thus be identified.
The general approach is then applied to a number of countries for scenarios matching the impact of the global financial crisis. The results are intuitive, but interesting and of relevance for policy. Poverty rises but there is not much of an impact on overall inequality. The new poor tend to be different from those who were poor before the crisis—in other words, the crisis impacts specific sections of the population. And the impacts are particularly concentrated in the middle of the income distribution.

An Assessment, and What’s Missing

The above is a broad summary of the methodology outlined in Chapter 1. Of course there is much greater detail in the specific papers, and there is a rich weaving together of country-specific institutional factors. But the overall approach and method should be clear. While one can of course have specific comments and criticisms of the individual country studies, or one or more of the components described above, my overall assessment is that this is an excellent start in the direction of what I have in mind, namely preparing ourselves for protecting the poor against the next crisis.

The authors of the studies and overall summary are of course themselves aware of the limitations—the level of disaggregation depends on availability of macro projections; various structural relationships are assumed to remain unchanged; no factor mobility; share of profits remains constant; and so forth. But moving in this direction would require a full-fledged general equilibrium model of the economy, the construction and operation of which would require its own assumptions and make its own data demands.

In my view, for the task at hand this project has struck the right balance between fine detailed modeling of economic relationships and interactions, and the need to get to concrete results with the data available. I would like to suggest, however, that effort should go further developing a number of missing elements that are central to providing a complete picture of impacts on the poor.

There is a strong focus on labor market status and labor income. Other sources of income are not treated with the same degree of careful attention. This may be acceptable in economies where labor income is the dominant source of income for the poor, such as in transition economies of Eastern and Central Europe, but for economies where small holder agriculture is significant, specific effort will have to go into modeling the farm and non-farm production activities of the household. I would see this as an issue in the Bangladesh case, for example. It may well be that the financial crisis, which was the focus of this project, transmits its impacts mainly through labor markets in the manufacturing sector. But for crises in general, models should have the capacity to build in transmission mechanisms that affect farm incomes and incomes from non-farm artisanal activities. For example, the impact of climate-driven crises will certainly have this as a major transmission mechanism.

I would like to use the above to make two further, more general, points. There is a strategic choice between how general our model should be—whether the base model should be able to capture a range of different types of crises, or whether the modeling itself should be done crisis by crisis. While a final answer to this will have to wait for the results of trial and error, my initial position is that for a capacity to do ex ante assessments of crises as a category, we perhaps need a broader range of transmission mechanisms built in to the modeling, even if we decide to switch some of them off for
specific simulations. In any event, what should be resisted is the notion that the same set of transmission mechanisms can be translated across crises.

My second point relates to the role of income in this analysis. The sources of household income are crucial in following through the macro transmission mechanisms down to the level of poor households. And yet, it might be argued with some justification that we give more importance in our household surveys to the expenditure side of information gathering. This flows from our natural concern with measuring poverty, and from the broad consensus that expenditure data are the best for this task. But the impacts of crises, and indeed of any major macro change on poverty, whether short term or long term, passes through income. We need to be able to allocate macro-level shifts in income composition, by sector and by factor, down to the household level. For this we need a detailed account of the sources of household income in our household surveys. I would argue that this aspect is underemphasized in household income and expenditure surveys, particularly for agrarian economies. With given survey resources, the balance between emphasis on the expenditure modules and the income, employment, and activity modules is a difficult one to assess. But the line of work in these papers, and the line of work that would be needed to get a handle on the impact of crises on the poor, argues for more weight than is currently given to modules that help to pin down the sources of income.

A central aspect of my proposed “stress testing” of the social protection system, in the face of different types of crises, is the need to model how individual protection programs will respond to different impacts of the crisis, transmitted through different mechanisms that are country and crisis-specific. This is done to some extent in the Poland study (Habib et al, 2010d) for unemployment insurance, but I would like to argue that this aspect is not as well developed in this approach as it should be.

What is it that needs to be done? For each country, we first of all need an inventory of the major social protection programs and, very important, their rules of operation. The most obvious programs for the “employment/unemployment” focus of this approach are of course unemployment benefit programs, and this is what is done for example in the Poland study. Thus when the crisis is simulated, and its unemployment effects are projected, the income impacts follow from the wage equations, but the net income impacts—that is to say net of unemployment benefits—need to be simulated based on the rules of unemployment benefit in that particular country.

But unemployment benefits are only one of a myriad of programs whose rules will, in principle, affect flows of public resources to households when a crisis hits. Thus, for example, conditional cash transfer programs have specific rules of eligibility, sometimes based on assessed household income. If the crisis leads to a dramatic fall in the incomes of some categories of households, and the eligibility assessment happens soon after the crisis hits, then these households will start receiving cash transfers. Although the logic of the program may have little to do with crisis support—it may instead be to do with incentivizing behaviors such as keeping children in school, or early health checks—in its operation it in effect becomes crisis support, and needs to be incorporated into the analysis. If these programs were small then perhaps they could be ignored. But some of these programs are very large in some countries—Progresa-Oportunidades in Mexico or the National Rural Employment Guarantee Act in India, for example. And even if individual programs are small, if collectively they represent significant injection to poor
households, then they need to be incorporated systematically into the analysis of the possible impacts of crises on the poor.

The above perspective requires that household surveys capture flows to households from social programs, distinguished by program in some detail. This is yet another dimension of the importance of having a detailed accounting of the sources of household income—market and non-market. The extent of detail available is likely to vary from country to country. The best is if the actual cash flow from different programs is accounted for. If this is not available, but there is information on whether the household participates or not, this could be used to develop assumptions on how the total outlay of the program (which we would get from national level administrative data) could be allocated across households as a baseline—in the same way that international remittances were allocated in the current project. In any event, what is important is that we do develop such a baseline where the monetary benefits of major social protection programs are allocated across households.

There are two further issues that I want to raise on this theme of social protection programs in crises. First, there are programs that make a contribution in kind, not cash. Free food, or subsidized food from ration shops, is the leading example, but there are others such as excusing school fees or paying for school uniforms, and so forth. There is of course a monetary equivalent of these in-kind transfers, and if these transfers to households change as program rules dictate when the crisis hits, then they should in principle be incorporated into the analysis.

The second issue is an important one, but difficult to address in practice. Of course, from the program rules of eligibility we can identify households that would fall into the program after the crisis hits, or specify the change in benefits of households already enrolled in the program. But this is the de jure analysis. In reality, whether the program delivers on the benefits depends on the budgetary allocations made to it. A good example of this is an “employment guarantee” scheme. In these programs, employment is supposedly guaranteed at a given wage (usually the local minimum wage) to all who turn up to the public works site. Thus, when the transmission mechanisms translate the crisis into employment losses and sharp wage declines, the number of people showing up at the public works site goes up. But will they be hired? The answer depends of course on whether the budget will rise pari passu. If it does not, there will be rationing of employment. For the domestic political economy, this raises the question of whether such budgetary allocations can indeed be guaranteed. In India, the National Rural Employment Guarantee Act provides a justifiable guarantee, an example of the polity trying to tie its own hands behind its back. For analysts, however, the above scenario requires that a judgment has to be made on whether or not budgets will indeed be increased to convert de jure rules into de facto outcomes. Of course, once the machinery for simulations is set up, we can simulate the impact of different levels of budgetary provisions, if we are willing to model how the rationing is implemented.

All of the above is in relation to identifying needs, gaps, and vulnerabilities as a range of crises materializes. But recall that there are two types of uncertainties—uncertainty of crisis type and uncertainty of crisis timing. The second type of uncertainty also raises issues for policy. In particular, it requires us to focus not so much on the ex ante comprehensiveness of the system of social protection programs, but on their flexibility. And this flexibility has two aspects—rapid response in scaling up programs when the
crisis strikes, and equally rapid scaling down when the crisis passes. In a sense we have already touched on the first—the question of budgetary resource availability can be related to the speed with which budgets can be increased. But we have not as yet discussed flexibility in the other direction, and this requires us to discuss what happens when the crisis passes—which microsimulation studies do not analyze.

To illustrate the issues that arise, let us compare food and fuel subsidies with employment guarantee schemes. On the scaling up side, the first has relatively easy flexibility both in technical terms (for example, simply reintroducing pass-through provisions for global fuel prices into domestic fuel prices) and in terms of political economy (generalized subsidies will have greater political support than employment schemes, which benefit only the poorest). When the crisis passes, however, the ranking is reversed. As employment and wages pick up after the crisis, public works rolls will presumably simply melt away as workers move to better opportunities in the rest of the economy. But once generalized subsidies are increased, it is very difficult politically to reduce them—for the very reason that the constituency that benefits from them is much larger.

The general point I am making is that an assessment of how well a social protection system does in the face of a crisis is incomplete without an assessment of what is left behind when the crisis passes. A full assessment will allow us to better design ex ante programs that, as a collectivity, are comprehensive and flexible, and flexible moreover in both directions.

Conclusion

To conclude, I have looked at the current body of microsimulation crisis forecasting (as exemplified in Chapter 1) through a particular lens—whether it contributes towards preparing to protect the poor against the next crisis. I believe these studies represent an excellent step in this direction, and any further work should and indeed will have to use them as a starting point. But future work will also need to extend and elaborate the analyses in a number of directions, including different types of crises, sources of market income, sources of non-market income, and the operation of a full range of social protection programs when crises hit and when crises recede.
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Economists have long sought to predict how macroeconomic shocks will affect individual welfare. Macroeconomic data and forecasts are easily available when crises strike. But policy action requires not only understanding the magnitude of a macro shock, but also identifying which households or individuals are being hurt by (or benefit from) the crisis. One popular solution is to extrapolate the welfare impact of a shock from the historical response of income or consumption poverty to changes in output, by estimating an “elasticity” of poverty to growth. Although this method provides an estimate for the aggregate poverty impact of a macro shock, it has limited value for analysts and policy makers alike. Aggregate numbers are useful to capture the attention of policy makers and the international community, but in the absence of any information on who is affected and to what extent, they provide little guidance on what actions need to be taken.

This World Bank Study outlines a more comprehensive approach to the problem, showcasing a microsimulation model, developed in response to demand from World Bank staff working in countries and country governments in the wake of the global financial crisis of 2008–09. Starting with the idea of using simple macroeconomic projections as the “macro linkages” to a microbehavioral model built from household data, the model was conceptualized, refined, and tested in Bangladesh, the Philippines, Mexico, Poland, and Mongolia. The results have fed into country policy dialogue and lending operations of Bank teams, as well as various country-level and global knowledge products of the Bank. In addition to a chapter on the microsimulation approach and its results, this volume includes three chapters written by experts external to the World Bank. In these chapters, the authors discuss a range of relevant issues: the implications of applying microsimulation techniques, how the approach can be extended or improved upon, the ability of governments to respond adequately to the results of such analysis, and the lessons that can be learned from the financial crisis of 2008–09 for mitigating the welfare impacts of future crises.

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