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The impact of food inflation on urban poverty and its monetary cost: some back-of-the-envelope calculations

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Data Appendix Available Online

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Abstract

This article uses a sample of 72 developing countries to estimate the change in the cost of alleviating urban poverty brought about by the recent increase in food prices. This cost is approximated by the change in the poverty deficit (PD), that is, the variation in financial resources required to eliminate poverty under perfect targeting. The results show that, for most countries, the cost represents less than 0.2% of gross domestic product. However, in the most severely affected, it may exceed 3%. In all countries, the change in the PD is mostly due to the negative real income effect of those households that were poor before the price shock, while the cost attributable to new households falling into poverty is negligible. Thus, in countries where transfer mechanisms with effective targeting already exist, the most cost-effective strategy would be to scale up such programs rather than designing tools to identify the new poor.

1. Introduction

The objective of this article is to estimate the monetary cost of alleviating urban poverty changes induced by the increase in food prices since 2005 in a large sample of developing countries. The cost is approximated by the change in the "poverty deficit" (Atkinson, 1987), that is, the variation in financial resources required to lift all urban poor out of poverty under perfect targeting.

In this context, the change in the urban poverty deficit (PD) can be decomposed into two additive elements: (a) the extra monetary cost (with respect to the initial situation) required to bring current poor households above the poverty line given the new set of prices, and (b) the monetary cost required to pull out of poverty those households falling below the poverty threshold due to price increases. Thus, we take into account both the change in the depth of poverty, that is, the increase in the poverty gap given the increase in food prices, and the additional number of urban poor.

Our estimates depend on three country-specific parameters for which we have data of limited comparability: (i) the change in the *domestic* relative price of food, which varies across countries due to different global prices pass-through to domestic prices; (ii) the share of the total household budget allocated to food consumption by those households below the poverty line or sufficiently close to it to be considered *vulnerable* to price changes; and (iii), the elasticity of substitution between food and nonfood items for poor and *vulnerable* households. Given the uncertainty regarding these three parameters we consider a range of plausible values in our computations, based on information for a subset of countries. On the other hand, there exists reliable and comparable country-specific information on urban poverty and income distribution that we use to estimate the change in the PD. The results show a range of estimates of changes in the PD for each country in our sample; these back-of-the-envelope computations can be refined with additional country-specific information as it becomes available.

We focus exclusively on urban poverty for various reasons. First, from a methodological viewpoint, it is critical to control for the positive income effect that food inflation has on the households that derive their income from agriculture-related activities. Unlike rural households, urban ones only derive a small share of their income from agricultural activities. [1] Hence, the assumption that food inflation will only affect the price of their consumption basket, leaving their income unchanged, is tenable. In contrast, rural households derive a substantial part of their income from agricultural activities, and estimation of the net impact of food inflation on rural poverty would require detailed and country-specific data that we do not have on a large and comparable basis. [2] Hence, the focus on the urban poor does not mean that rural poverty is not of concern; rather, it is an unfortunate consequence of the lack of valuable information.

Second, from a policy perspective, it is justifiable to distinguish urban from rural areas, in particular when it is advised to resort to targeted transfer programs to mitigate poverty (**World Bank, 2008b**). Indeed, these programs are, by nature, located in specific places (food-for-work programs, schools to send children) or destined to localizable agents. As such, it is possible to assess the adequacy of current and envisaged transfers in cities in response to the increase in poverty. Third, the inflation information captured by consumer price indexes (CPIs) reflects price changes taking place in the cities rather than in rural areas. Finally, focusing on urban areas—where a welfare loss will unambiguously occur as a consequence of higher food prices—allows us to identify countries at risk of potential social unrest.

There are alternative approaches to estimate the impact of the price shock on the poor. Compared with recent papers on the same subject (**Ivanic and Martin, 2008**; **Wodon et al., 2008**), the present article differs on several grounds. First, we use household survey data for 72 countries [3] covering 88% of the population living in developing countries in 2005. Second, in addition to measuring the impact of food price changes on the headcount poverty rate, we differentiate between the cost attributable to the "new poor" versus that one of the existing poor before the price increases. And third, our approach focuses only on urban households, ignoring income effects for food-producing households. Similarly to **Ivanic and Martin (2008)** and **Wodon et al. (2008)**, this study focuses on the short-term microeconomic impacts, ignoring second-round, or multiplier effects. [4,5] , [4,5]

Despite the methodological caveats and data limitations, this article is a useful first step to identify countries facing the highest risk level of severe disruption in their fight against urban poverty as a result of the food price shock. The note also gauges the order of magnitude of a ceiling for the cost of

these interventions, understood as aiming to offset the impact of food price spikes on urban poverty at US$1.25 or US$2.5 a day.

2. Methodology and stylized facts

2.1. Methodology

Define y_h as the per capita household income of household "h" and z as the minimum income required to purchase a basket of goods that satisfies a required level of consumption (the poverty line), most of which is food. If q individuals fall below z, the total monetary cost of providing those individuals with the required consumption level is defined as

$$PD = \sum_{i=1}^{q} (z - y_i) \quad (y_1 < y_2 \ldots < y_q \leq z). \tag{1}$$

The increase in food prices will raise the monetary cost of affording the same basket of goods. Assuming that incomes remain constant (consistent with our focus on consumption effects), the change in the PD due to an increase in the poverty line can be defined as follows:

$$\Delta PD = \underbrace{\sum_{i=1}^{q} (z^{t} - y_i) - \sum_{i=1}^{q} (z - y_i)}_{\text{Old Poor}} + \underbrace{\sum_{i=q}^{q^{t}} (z^{t} - y_i)}_{\text{New Poor}}, \tag{2}$$

where z^{t} and q^{t} represent the post-price increase extreme poverty line and headcount, respectively; hence $(y_1 < \ldots y_q \leq z < y_{q+1} \ldots < y_{q^{t}} < z^{t})$. The first two elements on the right hand side of Eq. (2) account for the increase in the poverty gap keeping the number of poor constant at q, that is, the old poor; the last element captures the increase in PD explained by an increase in the number of poor from q to q^{t} or the new poor. To measure the importance of PD in terms of the total resource of the economy, we define the cost of an increase in food prices as the change in the PD divided by the sum of total household income, $Y = \sum_{i=1}^{N} y_i$, quasi equivalent from a macroeconomic perspective to GDP.

Notice that the change in PD accounted by the old poor is equivalent to the concept of compensating variation (CV) introduced by Hicks and developed later by Deaton and Muellbauer (1980) and Deaton (1997): it has been applied in numerous empirical studies including Friedman and Levinsohn (2002), Niimi (2005), and Ackah and Appleton (2007). The CV measures the change in money income or expenditure, $c(\cdot)$, needed to maintain a constant utility level after a change in prices

$$CV = \Delta c = c(u^{0}, p^{1}) - c(u^{0}, p^{0}), \tag{3}$$

where p and u represent the vector of prices in the economy and the utility level, respectively. Using a second order Taylor expansion of the expenditure function, Friedman and Levinsohn (2002) show that the CV can be approximated by the following expression

$$\Delta c \approx x\Delta p + \frac{1}{2}\Delta p' * s\Delta p, \tag{4}$$

where x are the quantities consumed and s is the compensated derivative of demand. The second element in the right hand side of expression (4) allows for substitution effects, that is, a change in quantity demanded given a change in relative prices. Equation (4) can be reformulated in terms of proportional changes and household budget shares (Friedman and Levinsohn, 2002)

$$\Delta \ln c \approx \sum_i w_i \Delta \ln p_i + \frac{1}{2}\sum_i \sum_j w_i \varepsilon_{ij} \Delta \ln p_i \Delta \ln p_j, \tag{5}$$

where w_i is the budget share allocated to good "i," in our case being food, ε_{ij} is the price elasticity of good "i" with respect to price change "j." Therefore, the critical elements to estimate the CV for the poor given a change in relative prices are: (a) the share of food consumption in total household budget of the poor, (b) the change in relative prices, and (c) the elasticity of substitution between food and nonfood items for households below the poverty line. The CV for the old poor plus the extra cost accounted by the new poor will give the change in PD brought about by the increase in the price of food.

The three parameters required for our computation vary across countries and between households within the same country. Calculating the PD for a large number of countries implies collecting—and in some cases estimating—this household-level information, which is a gigantic undertaking. In this article, we simplified the task by computing the PD for each country under three different scenarios capturing plausible values of the three parameters yielding three scenarios: a central one, and a lower and upper bounds scenarios, respectively. The values of the parameters are discussed in the next section.

2.2. Stylized facts and data issues

Fig. 1 shows how the food budget shares and the price elasticity of demand change with the income level in a sample of about 100 countries. [6] As income increases, the food budget share declines from around 70% to 10%. The price elasticity of food demand is nonlinear, decreasing at low-income levels, and then increasing, with a range from −0.4 to −0.1.

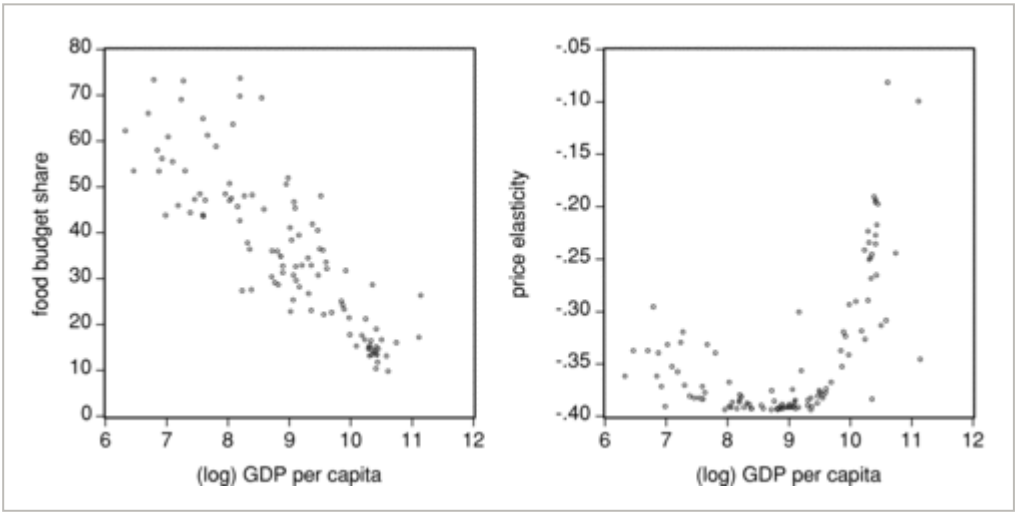

Figure 1

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Food budget share and price elasticity of demand across countries.

Our estimations consider a range for the food budget shares from 50% to 70%, with a midpoint of 60%. Recall that Fig. 1 shows country averages, and hence the poor in each country will have food budget shares higher than the national average. Additionally, this range covers a large proportion of the food shares among the poor reported in De Hoyos and Lessem (2008). The food price-elasticity can take extreme values of −0.3 or −0.1, with a mid value of −0.2.

The relationship between international and domestic food prices is country-specific. The transmission of high world prices to domestic prices depends on a number of characteristics such as: the depth of international markets for different commodities; countries' exchange rate variations against the U.S. dollar during the period; the degree of openness of the different economies; the nature of domestic policies in response to the shock; and country-specific diets and related food baskets, which often include items not traded internationally. Domestic relative food prices are affected by inflation of nonfood prices, which also varies by country.

Evidence on price transmission mechanisms is limited to few countries and commodities. [7] But incomplete pass-through combined with differentiated price inflation across commodities is consistent with the observation of relatively moderate food inflation in many developing countries relative to the overall consumer price index (see De Hoyos and Medvedev, 2008). Table 1 shows the changes in food relative prices in a few countries of different income levels. In all cases, food price inflation is significantly lower than international levels. The FAO obtains the same result with a different sample of countries over the period 2007–2008. [8]

Table 1.

Heterogeneity in the changes in relative prices, 2005–2008*

	CPI inflation (%)	Food inflation (%)	Change in food relative prices** (%)
India	16	22	12
Tanzania	32	39	14
Colombia	13	22	18
Nigeria	18	17	−2
Bolivia	23	38	30
Bangladesh	17	21	8
Mexico	9	15	12
Chile	12	20	16
Egypt	24	38	28
Pakistan	33	42	18

*Notes:**2008 only comprises data for the first quarter.

**The nonfood price inflation is estimated assuming a weight of 50% for food in the overall consumer price index. The change in relative prices is the difference between food and nonfood inflation.

Source: Calculations based on data from national statistical offices.

Based on this range of observed relative price changes over the period 2005–2008, the estimations reported in the next section considered three alternative scenarios for food relative price changes: 10%, 20%, and 30%.

Based on the possible values of the three varying parameters we derived three estimates—central, upper, and lower bounds—of the increase in the poverty line, or conversely the reduction in real income, resulting from higher food prices. [9] Table 2 summarizes results of three scenarios. The higher the relative price change, the higher the food share in total consumption, and the lower the price elasticity, the larger the decline in real income, in our case, 20%.

Table 2.

Estimates of change in real household income as a result of the change in relative food prices

	Relative price change (%)	Share of food consumption (%)	Price elasticity	Change in real income (%)
Upper bound scenario	30	70	0.1	−20
Central scenario	20	60	0.2	−11
Lower bound scenario	10	50	0.3	−4

Notes: The figures in the first three columns capture possible parameter values determining the real income effects of price changes among poor and near poor households (i.e., households near the poverty line). The upper and lower bound estimate can be interpreted as the worst and best case scenario, respectively. The figures are based on the stylized facts shown in Fig. 1 and Table 1. The change in real income is estimated using Eq. 5.

In turn, for a given change in real households' income the country-specific information on income or consumption distribution allows us to estimate the change in the PD. The computations are based on the micro dataset part of the Global Income Distribution Dynamics (GIDD) model. [10] The GIDD data includes 72 household surveys for low- and middle-income countries, the majority of them (54) use household per capita consumption as the welfare indicator, while the remaining surveys—all but one for countries in Latin America—include only per capita income as a measure of household welfare. The welfare indicator is expressed in 2005 purchasing power parity (PPP) prices for consistency with the $1.25 and $2.5 dollars a day poverty lines recently developed in Chen and Ravallion (2008). This large dataset together with aggregate information for China accounts for 88% of the population of the developing world in 2005. The advantage of having such a rich dataset is that we can compute the

initial and final PD taking full account of household heterogeneity, without relying on simple average characteristics of the poor or on parameterizations of the Lorenz curve.

3. Results

This section reports our estimates of the impact of food inflation on urban poverty at US$1.25 and US$2.5 a day in purchasing power parity of 2005. [11] Given the large number of country- and scenario-specific estimates, this section shows detailed results for those countries with the higher change in the PD under the central scenario. The results for all countries under each of the three scenarios are presented in Annex II.

3.1. US$1.25 a day urban poverty

Table 3 reports urban poverty rates and PDs before the price shock and *changes* in the poverty headcount and the PD after the price shock in the 20 most severely affected countries. The increase in urban poverty rate (or headcount, i.e., the proportion of the population below the poverty line) among the 20 most affected countries, averages 5 percentage points, and ranges from 2.8 to 6 percentage points. The cost—estimated as the change in the PD—reaches an average of 0.7 percentage points of GDP, ranging from 0.2% to 2.8%. It is noteworthy that close to 90% of the additional monetary cost stems from the loss in real income of those who were already poor before the price shock. Conversely, the additional monetary cost accounted for by the increase in the number of poor is relatively modest. This is due to the fact that the postprice shock poverty gap among the new poor is much smaller than that of the old poor.

Table 3.
Urban poverty at US$1.25 a day, 2005 PPP: countries at risk

Country	Initial situation (circa 2005)		2008 Central scenario			
	Poverty headcount	Poverty deficit	Δ In poverty headcount	Estimated cost	Due to new poor	Due to old poor
Nigeria	54.7	10.0	6.0	2.8	0.2	2.6
Tanzania	70.2	9.9	5.4	2.6	0.1	2.5
Benin	33.2	2.7	6.1	1.1	0.1	1.0
India	36.1	1.8	7.3	0.8	0.1	0.7
Indonesia	18.9	1.1	6.6	0.7	0.1	0.6
Haiti	31.2	2.5	2.7	0.5	0.0	0.5
Bangladesh	24.0	0.9	6.4	0.5	0.1	0.4
Armenia	12.2	0.7	5.2	0.5	0.1	0.4
Kyrgyz Rep.	17.0	0.8	4.3	0.5	0.0	0.4
Ethiopia	34.5	0.8	7.7	0.4	0.0	0.3
Guinea	12.7	0.6	5.0	0.4	0.1	0.3

Country	Initial situation (circa 2005)		2008 Central scenario			
	Poverty	Poverty	Δ In poverty	Estimated	Due to new	Due to old

Notes: (1) Authors' own calculations using data from the GIDD; (2) The PD is expressed as a proportion of the sum of total household incomes; (3) The estimated cost is defined as the difference between the initial PD and the PD after the price shock; (4) The poverty line is set at $1.25 (2005, PPP) per day; (5) See Annex II for a complete list of countries with results.

The results show that initial conditions matter tremendously in the determination of poverty impact, reflecting different initial rates of urbanization, urban poverty headcounts and gaps, and income distributions. Nigeria's 2005 GDP per capita might for instance exceed that of Ghana, yet the additional cost of alleviating urban poverty induced by food price increases is much higher in Nigeria (2.8% of GDP) than in Ghana (0.3% of GDP).

Fig. 2 shows how countries facing similar increases in poverty rates might also face very different costs (i.e., changes in PD) implied by the shock. For instance, Tanzania and Armenia's urban poverty rates increase by a similar magnitude (5.4 and 5.2 percentage points, respectively) in the central scenario. But the change in PD would exceed 2.5% of GDP in Tanzania, while it would be 0.5% in Armenia. This is explained by the different initial urban poverty rates in these two countries, with that of Tanzania being significantly higher.

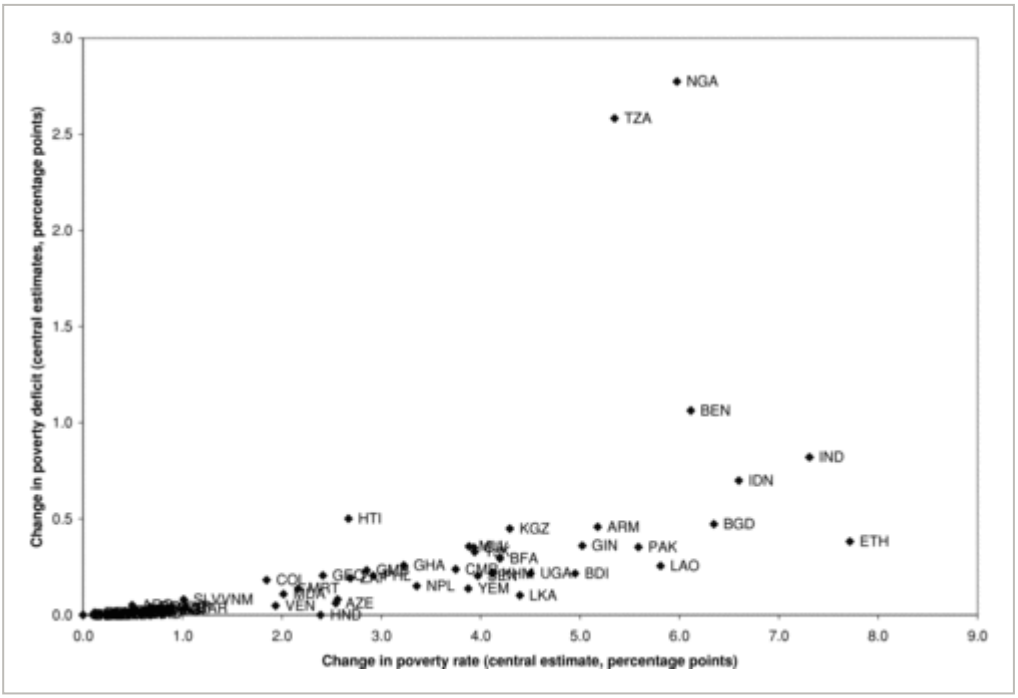

Figure 2

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Estimated changes in urban PDs and poverty rates (US$1.25 a day).

These figures vary with the upper and lower bound assumptions of real income changes (see Fig. 3). In Nigeria, for instance, assuming a 20% decline in real income induces a change in urban PD in excess of

5% of GDP. Yet, only in five countries out of 72, the upper bound cost estimate (at US$1.25 a day) exceeds 1% of GDP.

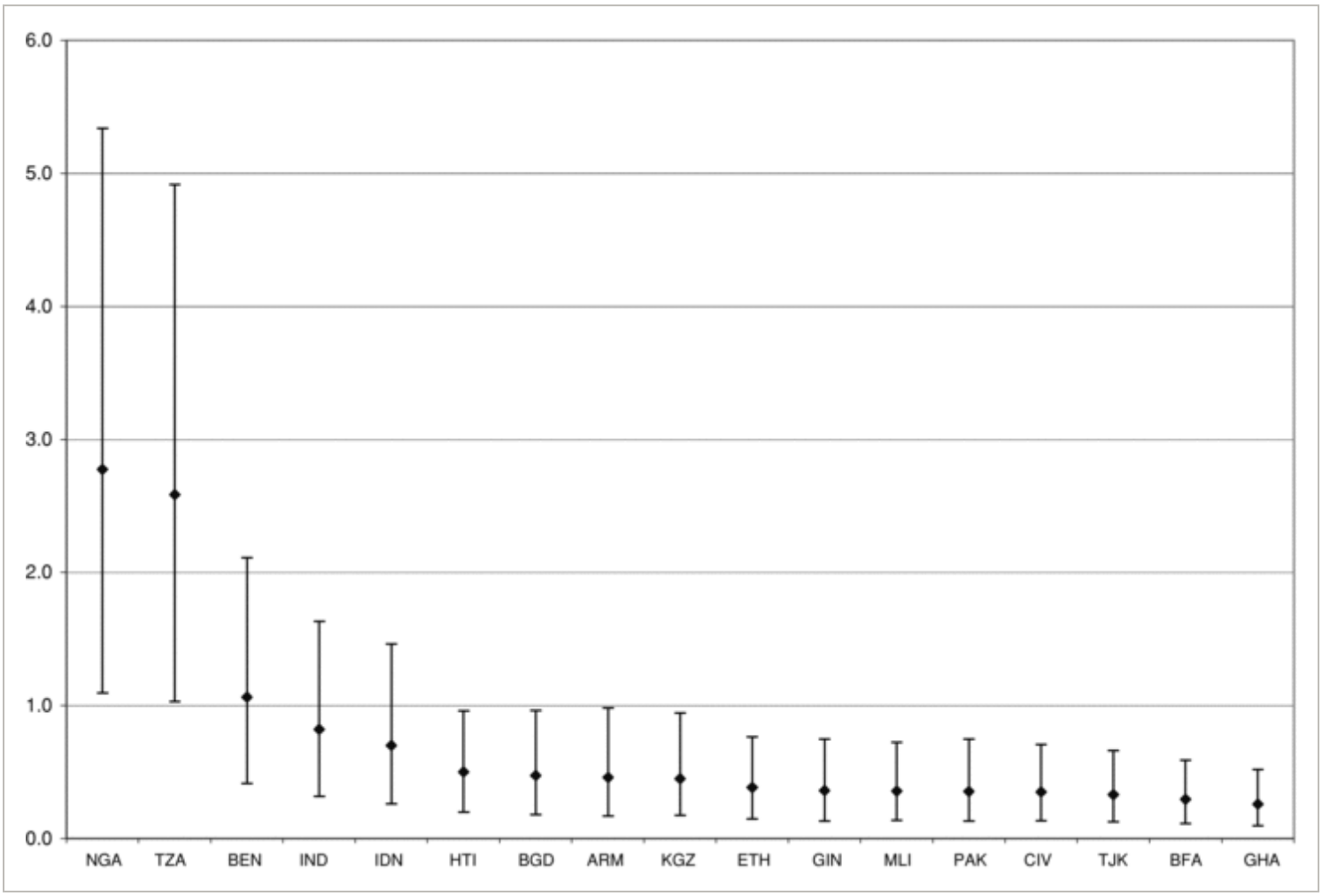

Figure 3

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Central, upper, and lower estimates of changes in urban PDs (US$1.25 a day)*.

*Central, upper, and lower scenarios defined in Table 2.

In contrast, there are 45 countries (out of 72 included in the sample) for which the estimated change in PD represents less than 0.2% of GDP when using central estimates, or 37 when using upper bound estimates. Even within the 45 countries where the cost is less than 0.2% of GDP, the average change in urban poverty headcount ratio approaches 1% of the urban population, which is not negligible. However, the cost as a share of GDP is relatively small suggesting that most of these countries have the domestic financial capacity to address the problem.

3.2. US$2.5 a day urban poverty

This section uses a poverty line of $2.5 international dollars per day, 2005 PPP, a definition that is probably more applicable to an urban setting. Hence, the estimates of the changes in PD presented in this section may be more realistic, especially for middle-income countries.

Table 4 reports the urban poverty rates and PDs before the price shock, and the change in poverty headcount and PD after the price increase in the 20 most severely affected countries. In these

countries the rise in urban poverty rates reaches an average of 5.8 percentage points, ranging from 1.4 to almost 8 percentage points. This would correspond to an average change in the PD (as a share of GDP) of 3.1 percentage points, ranging from 1.6% to 8.4%.

Table 4.
Urban poverty at US$2.5 a day, 2005 PPP: countries at risk

Country	Initial situation (circa 2005)		2008 Central scenario			
	Poverty headcount	Poverty deficit	Δ In poverty headcount	Estimated cost	Due to new poor	Due to old poor
Nigeria	80.0	42.9	2.9	8.4	0.1	8.2
Tanzania	95.4	38.1	1.4	6.8	0.1	6.8
Indonesia	68.4	14.7	5.9	4.5	0.2	4.3
Benin	71.9	17.9	4.8	4.4	0.1	4.2
Armenia	62.3	11.5	7.8	4.1	0.3	3.8
India	78.6	13.5	4.5	3.3	0.1	3.2
Kyrgyz Rep.	61.3	9.6	7.9	3.1	0.2	3.0
Guinea	59.8	8.6	7.2	3.0	0.2	2.8
Pakistan	69.0	8.5	6.4	2.8	0.1	2.7
Mali	55.9	7.8	7.6	2.6	0.2	2.4
Senegal	48.3	6.6	6.9	2.5	0.2	2.4
Bangladesh	65.2	8.6	6.2	2.4	0.1	2.3
Tajikistan	59.3	6.7	6.3	2.0	0.1	1.9
Côte	47.9	6.7	5.0	2.0	0.1	1.9

Notes: (1) Authors' own calculations using data from the GIDD; (2) The PD is expressed as a proportion of the sum of total household incomes; (3) The estimated cost is defined as the difference between the initial PD and the PD after the price shock; (4) The poverty line is set at $2.5 (2005, PPP) per day; (5) See **Annex II** for a complete list of countries with results.

Interestingly, 18 of the 20 most affected countries at US$2.5 a day are also among those most affected at US$1.25 a day (**Table 3**). The higher number of poor and near poor at US$2.5 a day than at US$1.25 a day explains the larger costs. In turn, the relationship between the change in poverty rates and the change in PDs becomes less pronounced (**Fig. 4**).[12] Benin and Ethiopia register similar increases in poverty rates, 4.8 and 4.2 percentage points, respectively, but the monetary cost is much higher in Benin (4.4 against 1.6% of GDP). This is true despite the fact that Ethiopia has a higher initial urban poverty headcount (76% vs. 72 in Benin), the difference in costs is explained by Ethiopia's lower-income inequality with a Gini coefficient of 0.29 compared with a Gini of 0.38 for Benin. Therefore, the initial income distribution will also determine the cost of higher food prices.

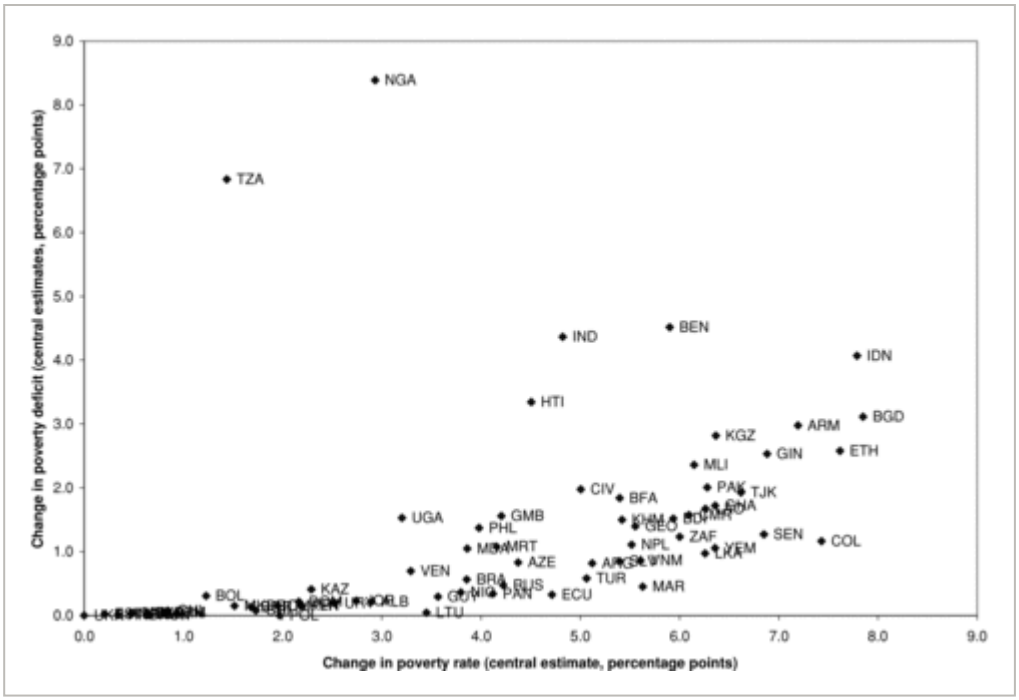

Figure 4

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Estimated changes in urban PDs and poverty rates (US$2.5 a day).

With this definition of poverty the number of poor increases significantly, as do the cost estimates in all countries. [13] There are 13 countries in which the cost exceeds 2% of GDP in the central scenario (Table 4), another 19 in which the cost fluctuates between 1% and 2%, and in the remaining 40 countries the cost is less than 1% of GDP. As in the previous case, most of the change in the PD (95% on average) is accounted for by the "old" poor becoming poorer rather than by the increase in the incidence of poverty.

The overall assessment of the poverty effects of higher food prices presented in this article is not subject to the assumption of homogenous food shares among the households below the urban poverty line. In 20 out the 72 surveys used in this study, the actual share of food consumption to total household consumption could be identified (for a complete list of countries see De Hoyos and Lessem, 2008). For these countries, the homogenous food share assumption across all households was relaxed and the change in the PD within this setting was compared with the results reported in Tables 3 and 4. On average, the difference in results was very small, and certainly within the margins of sampling and measurement errors of survey-based poverty estimates. Obviously, country-specific data are to be preferred when available, but this comparison leads us to think that our simple "back-of-the-envelope" methodology is a fairly good approximation of reality, and allows coverage of a much larger sample of countries.

4. Conclusions

This article estimates the urban poverty impact of recent food price inflation and its monetary cost in a sample of countries covering 88% of the population in the developing world. To achieve this large coverage, we relied on simplifying assumptions, which, necessarily, entails a trade-off in terms of country-specific accuracy. One of the more critical aspects and limitations of this exercise is its

exclusive focus on urban poverty. At the same time, focusing on urban poverty allows interpreting more safely the estimates as a minimum impact on poverty in the absence of readily functioning compensating mechanisms between rural and urban areas.

The results are useful for focusing attention on the identified set of countries where the urban PD increases the most and hence are more likely to experience demands for redistribution and, perhaps, social unrest. In most countries, the induced monetary cost of additional urban poverty is estimated to be small relative to GDP, even if poverty rates increase significantly. Nevertheless, in some countries the cost is significant. Unsurprisingly, the results suggest that countries with high initial poverty rates and poverty gaps, and high-income inequality, are particularly vulnerable to food price increases. For the same reasons, estimated changes in urban PDs at US$2.5 a day, 2005 PPP, exceed that estimated at US$1.25 a day, 2005 PPP. At US$1.25 a day, the average change in PD in the 20 most severely affected countries amounts to 0.7% against 3% at US$2.5 a day.

In all countries included in the study, the change in the PD is mostly induced by the negative real income effect of those households who were poor before the price shock, while the change in PD attributable to new households falling in poverty is negligible. Thus, in countries already equipped with effective targeting mechanisms, such as conditional cash transfers, the strategy that would produce faster results at lower costs would be to scale up such programs rather than designing tools to identify new poor. The challenge in this case lies in the ability to adjust responses to the permanent versus transitory nature of the shock, yet to a large extent unknown. [14] In other countries, resources should be devoted to rapidly implement effective targeting mechanisms in cities. Workfare programs or direct hand-outs could constitute short-term responses to the crisis in this context (World Bank, 2008b).

While it is unrealistic to envisage perfect targeting, the rough estimates provided in this article nevertheless provide an order of magnitude of the cost (excluding operational and implementation costs) of an efficient transfer program from coverage and targeting perspectives. These estimates can also be used to benchmark the cost of alternative policy options.

Footnotes

1 Unfortunately, there is no consistent and universally accepted standard for distinguishing urban from rural areas (World Bank, 2008c), and it is possible that in some countries dwellers in areas designated as urban receive substantial earnings from agriculture, either because they work in farms located in urban areas or receive transfers from rural areas. We voluntarily ignore these issues in the spirit of producing rapid calculations over a large sample of countries.

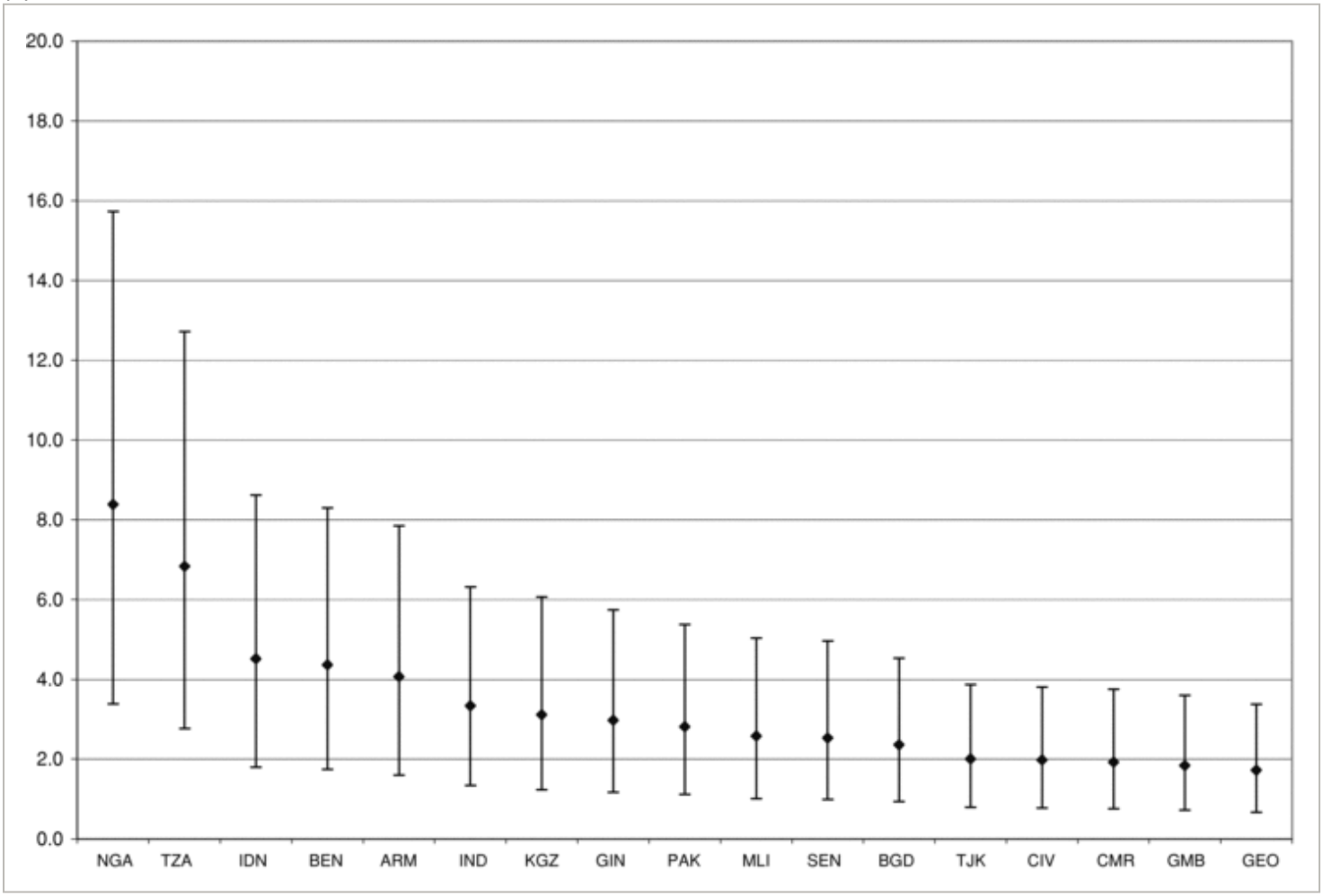
2 Not only the net buyer/seller position of rural households vis-à-vis each commodity needs to be known (such data are not always available in household surveys; and many developing countries simply do not have sufficiently recent surveys), but also the cost and factors' market structures to estimate who would benefit the most from food price spikes: farmers, land owners, intermediaries, etc.

3 Since the household survey data for China are not publicly available, the computations for this country relied on the PovCal parameterization of the Lorenz curve.

4 Ivanic and Martin (2008) also account for changes in unskilled wages rates so as to capture higher factor remuneration in agriculture. According to the authors, citing Ravaillon (1990), such a wage response could take several years. Passa Orio and Wodon (2008) estimate the longer-term impact of specific commodity price spikes on the price of other commodities through a social accounting matrix multiplier effect approach, and suggest that indirect effects are much more pronounced for oil than food. Dessus (2008), using a computable general equilibrium model, assesses the impact of imported food and oil inflation on domestic prices accounting for behavioral effects and substitution effects in the short, medium, and long run in Tanzania.

5 See World Bank (2008a) for a discussion of macroeconomic impacts of the current food crisis, as well as of its relationship with current high oil price levels. In fact, most developing countries face both a food and an oil

crisis, and the macroeconomic impact of the former is generally believed to be smaller than that of the latter.
6 Data source for food budget shares and price elasticities are from Seale et al. (2003). This range of food budget shares coincides with the budget shares derived from household surveys reported in De Hoyos and Lessem (2008).
7 FAO research suggests that the pass-through of the world price of rice in US$ to domestic markets in six Asian countries currencies over the period Q4-2003 to Q4-2007 ranged between 6% and 64%, or one-third on average (FAO, 2008). Baffes and Gardner (2003) shows that pass-through effects are weak and they vary across countries and commodities. Working with the overall food inflation figures derived from the CPI may bias the poverty effects of food inflation to the extent that the food basket in the CPI differs from the food basket of the extreme poor.
8 See FAO (2008).
9 The use of three different values for the three parameters discussed above (share of food in total consumption, relative price changes, and elasticity of substitution) yields 27 possible combinations. For the sake of clarity, we only report here the lower bound, the central, and the upper bound of the 27 possible estimates.
10 For an explanation of the GIDD and an application on the *ex ante* changes in global income distribution, see Bussolo et al. (2007).
11 See Chen and Ravallion (2008) for a discussion of the poverty lines and poverty estimates using 2005 PPP.
12 This is partly explained by the nonlinearity in the relationship between the poverty headcount and distributional-neutral changes in income. When the poverty lines lie on the tails of the income (or consumption) distribution, the poverty elasticity of growth—keeping the distribution constant—is lower than when the poverty line is around the mean.
13 These cost estimates vary with the upper and lower bound assumptions of real income changes (see Table 2 and Figure 5).
(5)



[Central, upper, and lower estimates of changes in urban PDs (US$2.5 a day)*.]
14 Current outlooks from most international institutions (OECD-FAO, 2008) now foresee a slow decline in food prices in 2008/2009, stabilizing thereafter to a higher plateau than in 2005/2006, yet remaining volatile. But such an outlook still remains quite uncertain. Indeed, the transitory versus permanent component of food inflation is yet to be quantified with more certainty. This is not an easy task as many important factors exerting influence on agricultural supply and demand can move in the near future in different directions, implying the existence of multiple equilibriums in the medium term. The policy response to the current crisis is itself one of these factors, as well as its interpretation by markets. Others comprise global macroeconomic imbalances, the impact of

climate change on agricultural yields and volatility, potential technological gains, energy prices, and possible remaining bubbles on financial and assets markets.

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Appendices

Annex I. Updating the poverty headcount ratio in the GIDD

The periodicity at which developing countries undertake nationally representative household surveys is very irregular, with some countries having one every 2, 5, or even 10 years and others not having any at all. This irregularity of survey years results in a very low number of countries for which a survey is available for a particular year. Additionally, the World Bank recently updated its official poverty figures to incorporate the information available from the new price comparison project (2005 PPP). To be able to work with the income/expenditure distributions of the relatively large sample of countries (72) included in the GIDD while at the same time being consistent with the latest official World Bank statistics on poverty headcount (measuring incomes and the poverty line in international dollars of 2005), we had to make use of some assumptions. The average income/consumption in all the household surveys in the GIDD were adjusted such that the national poverty headcount ratio was exactly the same as the ratio reported by the latest survey year available from PovCal (circa 2005) in 2005 PPP. Therefore, for countries where the latest survey available from PovCal and the GIDD differed, our exercise assumed that all the observed changes in poverty (measured in 2005 PPP) between the GIDD's survey year and the latest available from PovCal was the outcome of growth patterns rather than a combination of growth and changes in distribution. We believe that this is a minor limitation since the change in income (or consumption) distributions tend to be small over short periods of time.

Annex II. Detailed country results

Table A1.

Urban poverty at US$1.25 a day, 2005 PPP: estimated poverty headcounts and deficits

	Initial situation (circa 2005)		Final situation (after price shock)							
	Poverty rate	Poverty deficit	Central scenario				Upper scenario		Lower scenario	
			Poverty rate	Poverty deficit	New poor	Old poor	Poverty rate	Poverty deficit	Poverty rate	Poverty deficit
Albania	1.0	0.0	1.5	0.0	0.0	0.0	2.3	0.1	1.3	0.0
Argentina	4.5	0.2	5.0	0.2	0.0	0.2	5.7	0.3	4.6	0.2

	Initial situation (circa 2005)		Final situation (after price shock)							
	Poverty rate	Poverty deficit	Central scenario				Upper scenario		Lower scenario	
			Poverty rate	Poverty deficit	New poor	Old poor	Poverty rate	Poverty deficit	Poverty rate	Poverty deficit
Armenia	12.2	0.7	17.4	1.1	0.1	1.0	22.1	1.6	14.4	0.8
Azerbaijan	2.8	0.1	5.3	0.1	0.0	0.1	7.0	0.2	3.5	0.1
Burundi	25.7	0.7	30.7	0.9	0.0	0.9	33.8	1.1	28.0	0.8
Benin	33.2	2.7	39.3	3.8	0.1	3.7	43.9	4.8	35.4	3.1

Table A2.

Urban poverty at US$2.5 a day, 2005 PPP: Estimated poverty headcounts and deficits

	Initial situation (circa 2005)		Final situation (after price shock)							
	Poverty rate	Poverty deficit	Central scenario				Upper scenario		Lower scenario	
			Poverty rate	Poverty deficit	New poor	Old poor	Poverty rate	Poverty deficit	Poverty rate	Poverty deficit
Albania	14.8	0.7	20.4	1.2	0.1	1.1	25.4	1.7	17.8	0.9
Argentina	13.4	1.0	14.7	1.3	0.0	1.3	16.2	1.6	13.9	1.1
Armenia	62.3	11.5	70.1	15.6	0.3	15.3	74.7	19.4	65.8	13.1
Azerbaijan	32.6	2.5	40.0	3.6	0.1	3.5	47.2	4.8	35.4	2.9
Burundi	52.4	3.6	56.8	4.4	0.0	4.4	60.1	5.2	54.0	3.9
Benin	71.9	17.9	76.7	22.3	0.1	22.1	79.9	26.2	73.6	19.7
Burkina Faso	52.9	5.2	56.9	6.5	0.1	6.5	59.9	7.8	54.9	5.7
Bangladesh	65.2	8.6	71.3	10.9	0.1	10.8	76.3	13.1	67.4	9.5
Bulgaria	5.0	0.3	7.2	0.5	0.0	0.5	8.7	0.7	5.7	0.4
Belarus	0.5	0.0	0.9	0.0	0.0	0.0	1.3	0.1	0.6	0.0
Bolivia	7.5	0.4	9.7	0.6	0.0	0.6	11.3	0.7	8.8	0.5

Supporting Information

Appendix

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Filename	Description
AGEC_348_sm_DataAppendix.zip 411.8 KB	Supporting info item

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