The Effect of Rising Food Prices on Poverty in Honduras

Gabriel Demombynes, Eliana Rubiano, and Carlos Sobrado
LAC Poverty and Gender Group

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We evaluate the impact of recent rising food prices on household welfare and poverty in Honduras, using a microdata simulation approach which takes into accounts effects via consumer prices, producer income, and wages. We show that domestic and international price trends for particular products differ markedly, highlighting the importance of employing domestic price data as we do in our analysis. Our preferred estimates imply that rising food prices during the period May 2007-May 2008 reduced per capita consumption for the average household by 4.8 percent and increased the headcount poverty rate by 4.0 percentage points. Impacts are largest, relative to initial consumption, for those who are not in the top quintile, and the poverty gap has risen much more than the headcount. Because the effect through consumer prices is partially offset by rising agricultural wages, rural poverty has increased less than urban poverty.

 The work for this note was undertaken as part of a larger study examining the impact of rising food prices in detail for several countries in Latin America and the Caribbean. The estimates presented in this note are preliminary and may be revised subject to further methodological refinements developed over the course of the study. The authors thank Maros Ivanic for his guidance on the wage portion of the analysis. The authors may be contacted at gdemombynes@worldbank.org, erubiano@worldbank.org, and csobrado@worldbank.org

1. Introduction

Recently, food prices have risen dramatically around the world. Between March 2006 and March 2008 the international food price index rose 82 percent, and seven countries in the Latin America and the Caribbean Region experienced double-digit rates of food inflation. The rise in food prices affects welfare through multiple channels and is particularly important for the consumption of the poor, who spend a large share of their income on food. Because the full welfare impact of the rise in food prices depends on a number of country-specific characteristics, detailed analysis is required to evaluate the full impact food inflation in a particular country.

This paper is the first in a series of country notes that will examine the impact of rising food prices on welfare and poverty rates in Latin America and the Caribbean Region. The approach employed in this note involves simulating changes in household welfare due to observed increases in food prices. Three types of effects are considered: 1) direct changes in consumption levels due to changes in consumer prices, 2) changes in income due to changes in producer prices, and 3) changes in income caused by changes in food prices through agricultural wages. The analysis employs household survey data from Honduras's 2004 *Encuesta Nacional de Condiciones de Vida* and the Honduras Central Bank's national price data at the level of individual products for the period May 2007-May 2008.

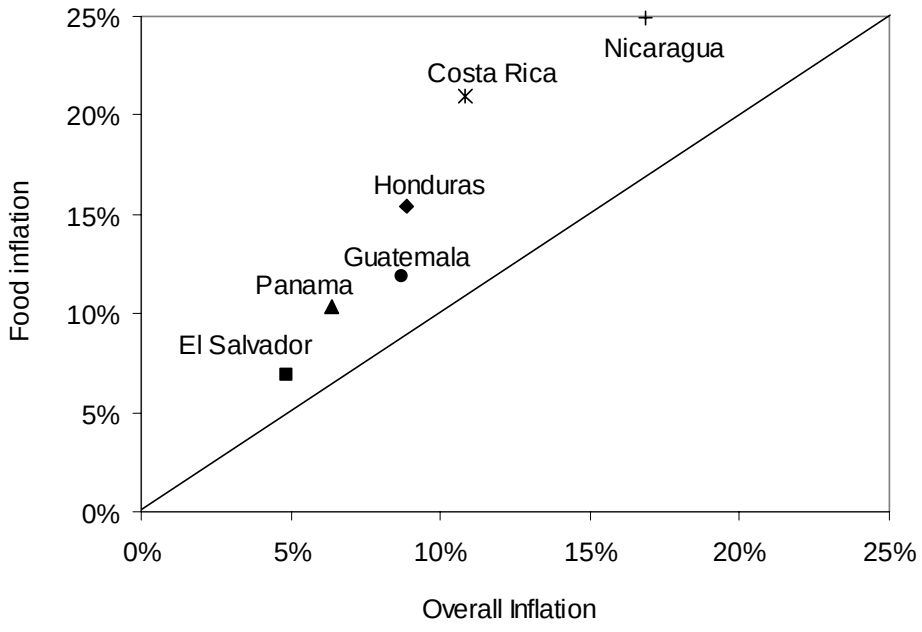
This note consists of six sections, including this Introduction. Section 2 provides stylized facts on the evolution of food prices in Honduras and the world. Section 3 explains the methodology used in this note. Section 4 presents the results of the analysis, and Section 5 concludes.

2. Food Price Trends in Honduras and the World

The increase in food prices throughout the last two years has been a global event. Figure 1 shows that in all Central American countries food inflation in 2007 was higher than overall inflation. In Honduras during May 2007-May 2008, food prices rose at 17.3 percent, compared to an overall inflation rate of 11.2 percent.

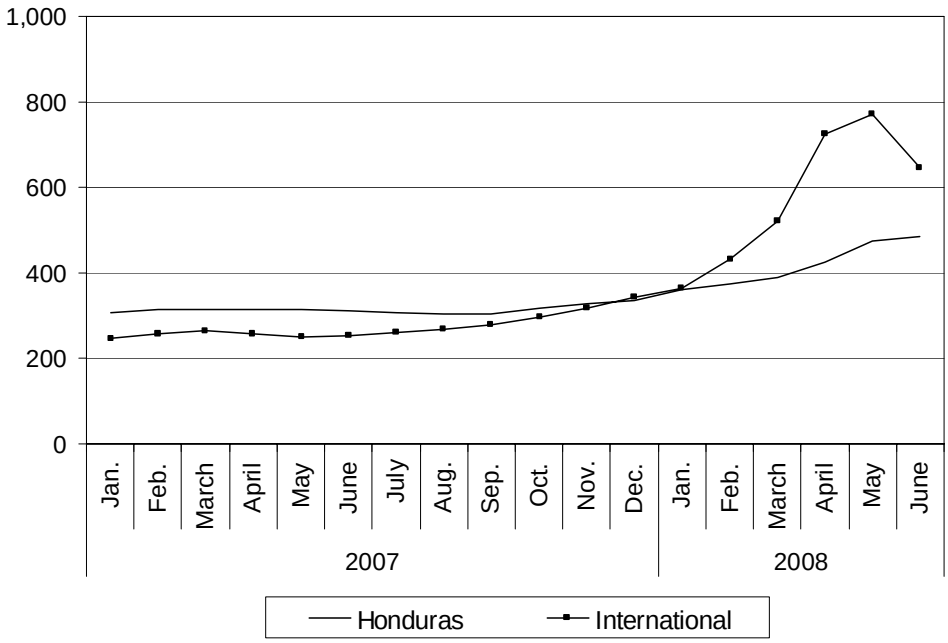
International food price increases have been largest for oils and cereals, while the prices of sugar and beef have shown minimal change. However, there have been substantial differences between Honduras and international food prices. The trends for international and domestic Honduras grain producer prices (rice, corn and sorghum) are shown in Figures 2-4. The domestic and international prices of rice followed a similar trend until January 2008, when international price rose from US$365 to US$772 per Ton (or 111.8 percent) in just four months. During the same period in Honduras, the producer price of rise rose much less, from US$360 to $US447 per ton, a rise of 32.5 percent.

Figure 1. Annual Food and Overall Inflation in Central America, 2007



Source: National Statistical Institutes

Figure 2. Monthly Rice Prices in USD per Ton

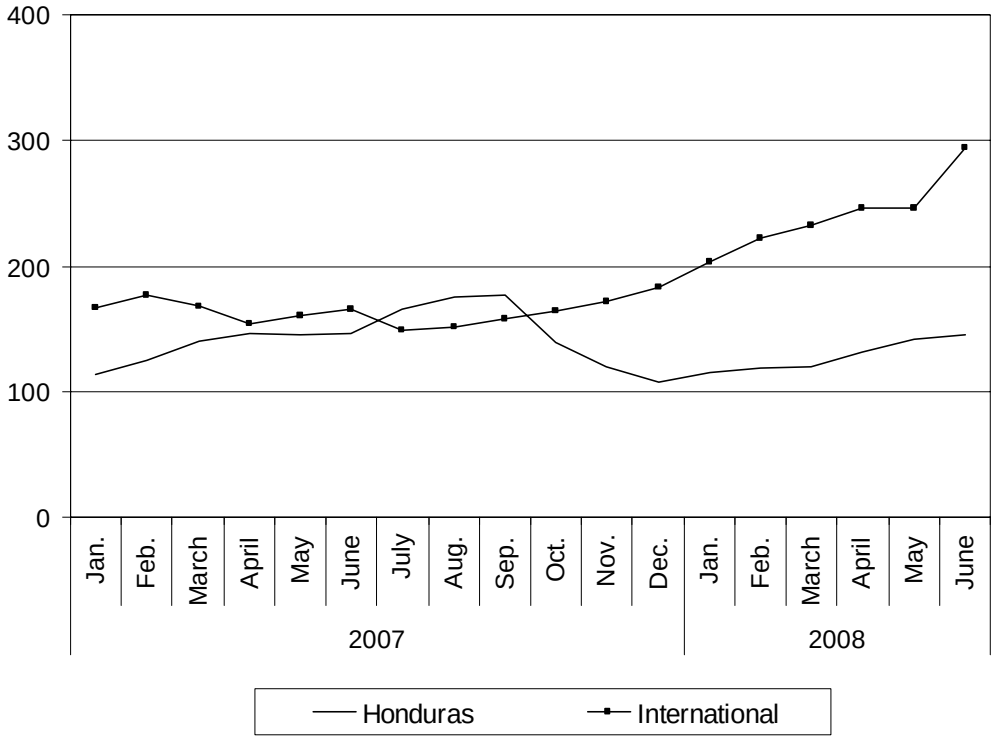


Sources: U.S. Department of Agriculture, Instituto Nacional de Estadísticas (Honduras)

The price of corn in Honduras has also diverged from the international price. While the international price increased 86 percent from September 2007 through May 2008, the Honduras domestic price decreased by 18 percent over the same period. In this case part of the difference is likely due to seasonality of locally produced corn. The most important harvest in the country is collected around September, corresponding to the period of price reduction shown in Figure 3. For sorghum, the divergence between international and domestic prices is even larger, as shown in Figure 4.

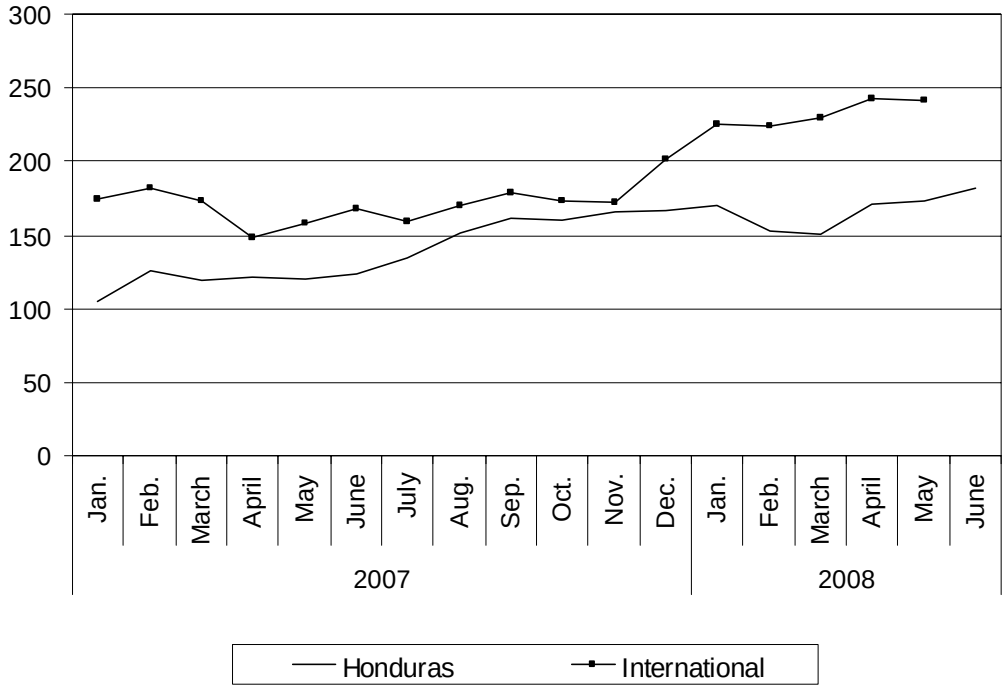
There are a number of possible explanations for the divergence between international and domestic commodity prices, including the following. These include domestic monopoly power, subsidies, trade restrictions, and costs associated with local transportation, transportation, and marketing. For the purposes of this note, we do not attempt to determine the particular sources of the divergence in Honduras. The fact that there is such a difference between domestic and international price evolution demonstrates that it is crucial that an analysis of the impact of food prices on welfare and poverty employ domestic rather than international prices.

Figure 3. Monthly Corn Prices in USD per Ton



Sources: International Grain Council, Instituto Nacional de Estadísticas (Honduras)

Figure 4. Monthly Sorghum Prices in USD per Ton



Sources: U.S. Department of Agriculture, Instituto Nacional de Estadísticas (Honduras)

3. Methodology

We analyze the impact of changes in food prices on consumption and poverty rates using household survey data for Honduras. The analysis follows the overall approach used by Ivanic and Martin (2008), which is based on Singh, Squire, and Strauss (1986) and Deaton (1989, 1997). Ivanic and Martin show that beginning with a simple expenditure function, the welfare impact of price changes can be evaluated with a simulation approach. More specifically, we can evaluate the change in achievable level of expenditure due to the effect of price changes on real incomes. Unlike Ivanic and Martin, who used international prices, we employ detailed national price data for the period May 2007-May 2008 for all commodities available in the Honduras LSMS 2004 household survey and estimate the impact on per capita consumption.

We consider the effects of changes in household welfare through three channels: 1) changes in purchasing power for consumers, 2) changes in producers' income derived from sales, and 3) changes in wages for agricultural workers. The relationship is illustrated in equation (1).

$$\Delta E_i = \Delta E_{C,i} + \Delta E_{P,i_i} + \Delta E_{w,i} \qquad (1)$$

where ΔE_i is the total change in achievable expenditure for household *i*, $\Delta E_{C,i}$ is the change associated with consumer purchasing power, $\Delta E_{P,i_i}$ is the change associated with producers' income, and $\Delta E_{w,i}$ is the change associated with agricultural wages.

We assume that the change in achievable expenditure is fully reflected in consumption and add these changes estimated at the household level to the observed consumption values from the 2004 survey to produce a simulated distribution of household consumption that reflects the impact of food price increases from May 2007 through May 2008. As a first order approximation, we assume no change in consumption and production patterns in response to price increases.[1] This is a reasonable assumption for considering the short-run effects. Over the long term, however, households will respond to higher prices through substitution of lower priced products in expenditure and a variety of possible measures on the production side.

The analysis was limited by the lack of complete price data. Since national food prices do not explicitly cover the household consumption and sales basket in the survey, some products of the LSMS were matched to the main categories reported in the price survey products.[2] We calculate that prices were available for 71.9 percent of average food expenditure (78.8 percent for the poor) and for 82.9 percent of average food sales (80.6 percent for the poor).[3]

3.1 Effects Due to Changes in Consumer Prices

To evaluate the household impacts on consumer expenditure due to changes in food prices, for each product in household expenditure we multiply the percentage change in each product's real price by the initial value of product expenditure observed in the survey:

$$\Delta E_{C,i} = -\sum_{j=1}^{k}\left[e_{i,j} * \left(\frac{p_j^1 - p_j^0}{p_j^1} \right) \right] \qquad (2)$$

where p_j^0 indicates the real price of product *j* in May 2007, p_j^1 indicates its price in May 2008, and $e_{i,j}$ is household *i*'s expenditure on the product in the survey.

3.2 Effects Due to Changes in Producer Incomes

[1] We are also assuming, for carrying out the analysis, that consumption patterns in 2007 are the same as those observed in 2004 from the household survey.

[2] For example, the price of pasteurized milk was assigned to skim and whole milk. The price of butter was also assigned to both light and yellow butter, and the price of white bread was used for whole and sweet bread in the consumption basket. The different kinds of cheese in the survey (kraft, quesillo, dry and white cheese) were proxied by the price of white cheese.

[3] These calculations are based on average shares in consumption, average across households, rather than total consumption shares.

To evaluate the impacts of changes in food prices on producer's income for each product sold, we conduct similar analysis to that for consumption. For each product sold, we multiply the the value of sales observed in the survey by the percentage change in each product producer's real price by

$$\Delta E_{P,i} = \sum_{j=1}^{k} \left[q_{i,j} * \left(\frac{p_j^1 - p_j^0}{p_j^1} \right) \right] \qquad (3)$$

where $q_{i,j}$ is the original value of sales observed in the survey.

The analysis assumes no change in production patterns in response to price increases. This is a reasonable assumption in the short-run, given the time lags between producer decisions and crop production. Over a longer time horizon, it is likely that some producers will alter their production decisions in response to the price increases, and new producers may enter the market.

3.3 Effects Due to Changes in Wages

We estimate the impact of changes in food prices on wages and, following the approach of Ivanic and Martin. We estimate the change in household achievable expenditure by adding estimated changes in agricultural and non agricultural wage income due to real price changes. This component takes the following form:

$$\Delta E_{w,i} = w_i^A * \gamma^A + w_i^{NA} * \gamma^{NA} \qquad (4)$$

$$\gamma^A = \sum_{j=1}^{k} \varepsilon_j^A * \left(\frac{p_j^1 - p_j^0}{p_j^1} \right) \qquad (5)$$

$$\gamma^{NA} = \sum_{j=1}^{k} \varepsilon_j^{NA} * \left(\frac{p_j^1 - p_j^0}{p_j^1} \right) \qquad (6)$$

where w_i^A is household *i*'s agricultural wage income, w_i^{NA} is the household's non-agricultural wage income, ε_j^A is the Stolper-Samuelson relationship between non agricultural wages and food prices (p_j) and ε_j^{NA} is the is the Stolper-Samuelson relationship between non agricultural wages and food prices (p_j). The elasticities were estimated using the Global Trade Analysis Project (GTAP) computable general equilibrium model, assuming a labor market segmented between agricultural and non-agricultural workers.

How Are Real Price Changes Defined?

The analysis is framed in terms of simulating changes in real prices of individual food items. The change in the real price is equivalent to the change in the nominal price minus the change in some price index. If we were dealing with a change in the price of a single item, the correct choice of a background inflation measure would clearly be the change in the overall consumer price index (CPI). However, the analysis in this paper considers the effects of a large simultaneous increase in the prices of many items, which collectively have a large weight in the overall CPI. Consequently, the proper choice of a measure of background inflation is less obvious.

We argue that the best measure of the real price change in an item is the change in the item's nominal price, deflated by the *non-food* price index. This approach posits that "background" inflation is best-approximated by non-food inflation and takes the changes in food prices as exogenous. Our preferred estimates use this measure.

We also conduct sensitivity analysis using alternative assumptions. In one case we take the change in the nominal price as the change in the real price. In another case, we define the real price change in an item as the change in the item's nominal price deflated by the *overall* consumer price index.

4. Results

Table 1 presents results from the analysis, showing impacts on per capita consumption by quintile. On average, the changes in food price have reduced per capita consumption by an average of 69 Honduran lempiras per month, which is equal to 4.8% of initial levels of consumption.[4] This reflects a decline of 94 lempiras due to effects through consumer prices, offset by increases of 6 lempiras in producer income and 19 lempiras in wage income.

Table 1. Impact of Food Price Changes on Per Capita Consumption by Quintile through Consumer Prices, Producer Income and Wages

		Change in Consumption Via Impacts on				
Quintile	Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption
1 (Poorest)	335	-46	5	17	-24	-7.2%
2	608	-71	8	20	-43	-7.1%
3	984	-99	8	20	-71	-7.2%
4	1,559	-121	5	15	-101	-6.5%
5 (Least Poor)	3,559	-135	4	23	-107	-2.9%
National	1,423	-94	6	19	-69	-4.8%

Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.

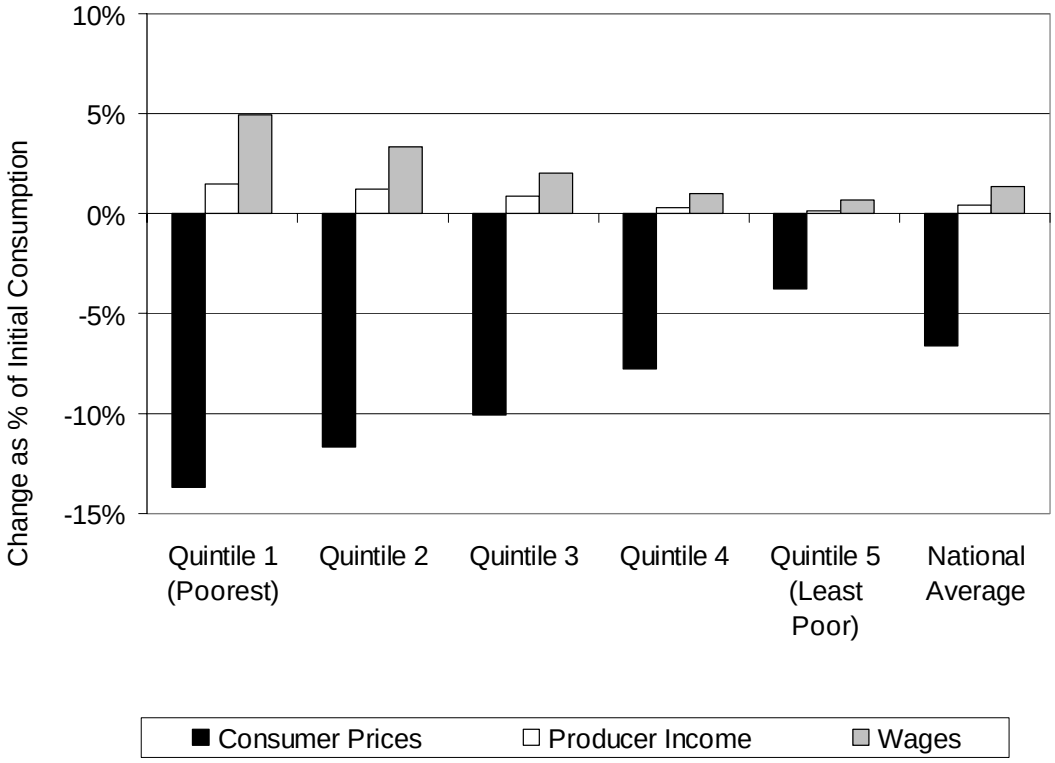
[4] According the World Bank's World Development Indicators, in Purchasing Power Parity terms, nine lempiras was equivalent to US$1 in 2007.

Note: Monthly per capita consumption levels were calculated using the 2004 LSMS. Values are presented in the local currency, Honduran Lempiras. Households are classified by quintiles based on per capita consumption.

When considered by quintiles, the net effect in lempira terms is largest for the least poor households. However, as a percentage of initial consumption, the average effects are similar for those in the bottom four quintiles—amount to approximately 7 percent of consumption—and just 2.9 percent for those in the top quintile.

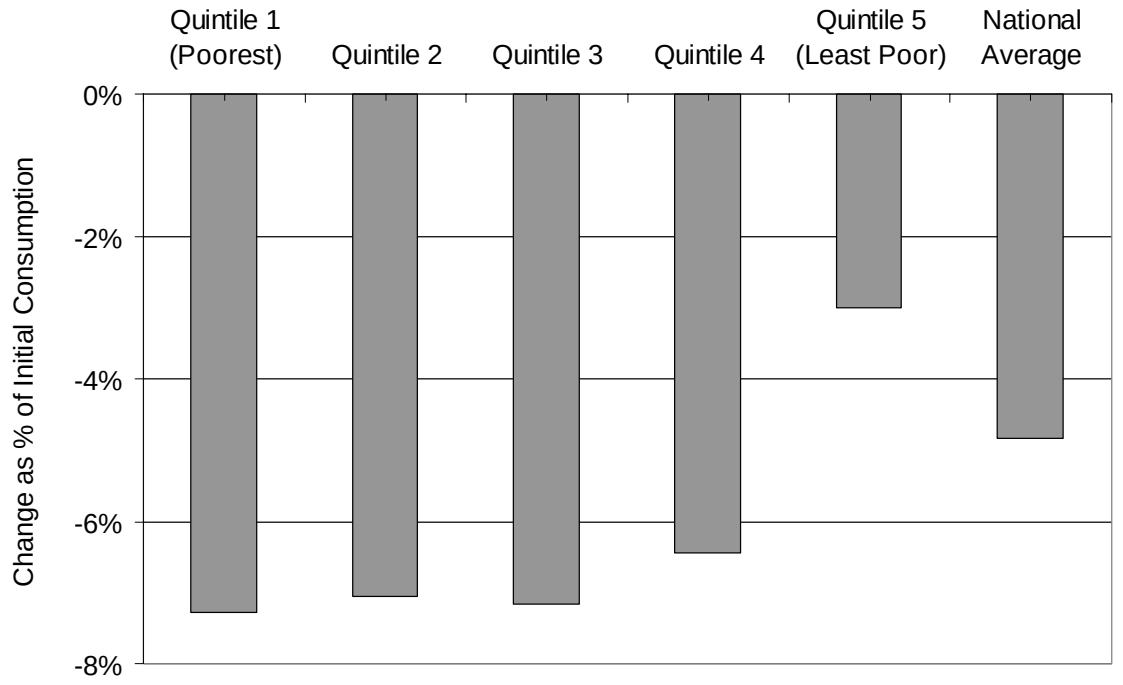
For all quintiles, the effect of rising food prices is dominated by the effect via consumer prices. The effect through consumer prices in lempira terms is largest for those in the top quintile. However, in percentage terms, the consumer price effect is much larger for those in the poorer quintiles. This reflects the fact that poor people allocate a large portion of their consumption to food. The effect on producer income is negligible for all quintiles, while the effect through wages is similar in lempira terms for all quintiles and most important in percentage terms for the poorest.

Figure 5. Impact of Food Price Changes on Consumption by Quintile through Consumer Prices, Producer Income and Wages



Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Households are classified by quintiles based on per capita consumption.

Figure 6. Net Impact of Food Price Changes on Consumption by Quintile



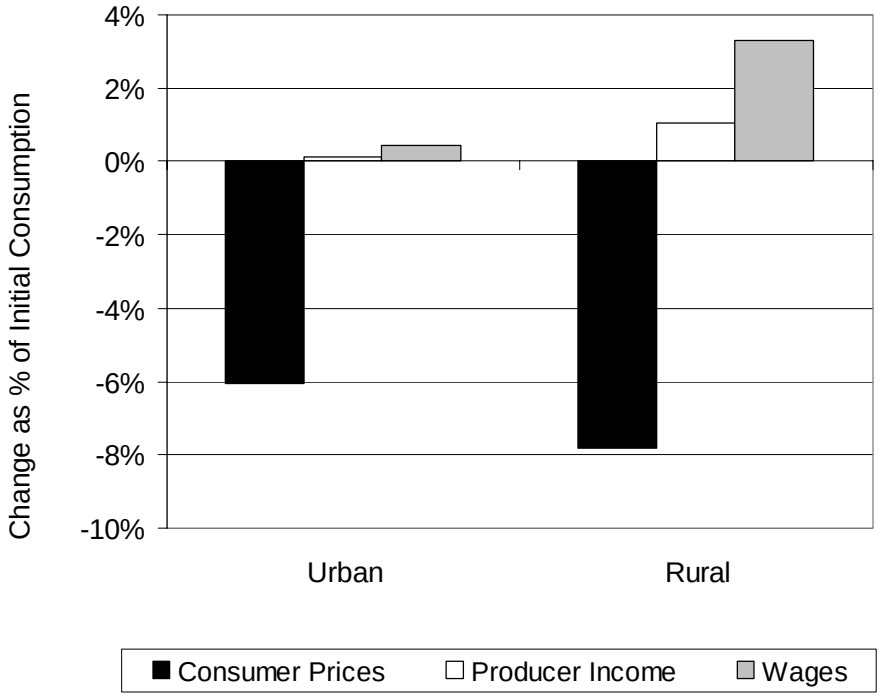
Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Households are classified by quintiles based on per capita consumption.

Table 2. Impact of Food Price Changes on Consumption by Poverty Group and Geographic Area through Consumer Prices, Producer Income and Wages

			Change in Consumption Via Impacts on				
		Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption
Poverty Group	Extreme	335	-48	6	17	-25	-7.4
	All Poor	558	-65	7	19	-39	-6.9
	Non	2314	-124	5	19	-100	-4.3
Geographic Area	Urban	2005	-121	3	9	-110	-5.5
	Rural	881	-69	9	29	-31	-3.5
National Average		1423	-94	6	19	-69	-4.8

Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Monthly per capita consumption levels were calculated using the 2004 LSMS. Values are presented in the local currency, Honduran Lempiras.

Figure 7. Impact of Food Price Changes on Consumption by Geographic Area through Consumer Prices, Producer Income and Wages



Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.

Overall, the impact in urban areas has been greater than that in rural areas because the effect through consumer prices has been partially offset in rural areas by the positive effect on wages. Results for urban and rural areas separately are shown in Figure 7.

To assess the impact on poverty rates, we adjust each household's consumption by the simulated change due to effects through the three channels and then recalculate poverty rates, using extreme and overall poverty lines used in the World Bank's 2006 Honduras Poverty Assessment.[5] With the new consumption

[5] The extreme poverty line is defined as the monthly cost of food to provide 2200 calories per day (510 lempiras), given average consumption patterns observed in the survey. The full poverty line is equal to the extreme poverty line plus an additional allowance for non-food consumption (996 lempiras) (World Bank 2006).

aggregates and the old poverty lines, the poverty headcount and poverty gap index were estimated. These results are shown in Table 3.

The initial data showed that 50.7 percent of Hondurans were poor, with 23.7 percent below the extreme poverty line. We estimate that food price changes have increased the national headcount by 4.0 percentage points and the extreme poverty rate by 3.3 percentage points. As a percentage of the initial values, these amount to a 7.9 percent increase in overall poverty and a 13.9 percent increase in extreme poverty.

Table 3. Estimated Poverty Headcount with Impact of Food Price Changes

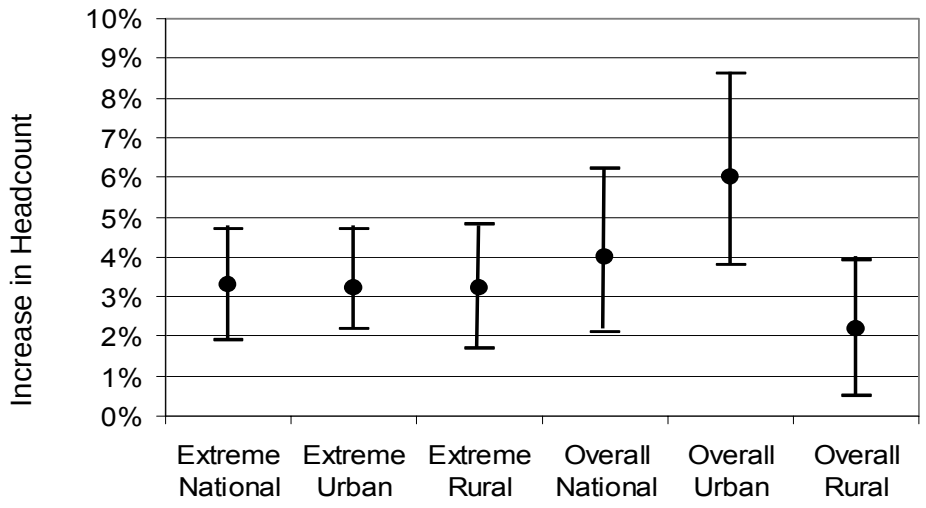
	Headcount with Impact of Food Prices		Increase over Initial Headcount		Increase as % of Initial Headcount	
	Extreme poor	All poor	Extreme poor	All poor	Extreme poor	All poor
National	27.0	54.7	3.3	4.0	13.9%	7.9%
Urban	10.0	33.6	3.2	6.0	47.1%	21.7%
Rural	42.7	74.4	3.2	2.2	8.1%	3.0%

Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.

Extreme poverty headcount increases between urban and rural households are of exactly the same magnitude (3.2 percentage points), but in relative terms this is almost a 50 percent increase in urban extreme poverty, while it represent less than a tenth for rural poverty (Table 3). For overall poverty, rural households experience a much smaller increase than the urban households in absolute as well as relative terms.

We also estimated results taking alternative definitions of the changes in the "real price of food" items. For a lower bound case, real price changes were defined in terms of changes in food prices deflated by the overall consumer price index (CPI) instead of the non-food CPI used for our preferred estimates. For an upper bound, real price changes were defined to be equal to nominal price changes. Figure 8 shows a plot of the effects on poverty using these upper and lower bound definitions.

Figure 8. Changes in Headcount: Upper and Lower Bounds under Alternative Definitions



Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: The ranges presented are the upper and lower bound values for the poverty rates simulations. These are based on the assumptions used for the change in real prices of individual food items. The middle point corresponds to our preferred estimates, using Non Food Consumer Price Index for deflating; the upper bound refers to the assumption of nominal price changes and the lower bound corresponds to the estimates using Consumer Price Index as the price deflator.

Next, we consider the impact of food price changes on the poverty gap index. As percentage of initial values, these effects are larger than those on the headcount. The poverty gap index increases 22.5 percent for extreme poverty and 10.8 percent for overall poverty (Table 4). The same general tendencies seen in the headcount rate variation are observed in the Poverty Gap Index variation: higher increases in urban households and higher percentage increases in extreme poverty.

Table 4. Estimated Poverty Gap with Impact of Food Price Change

	Poverty Gap with Impact of Food Prices		Increase over Initial Poverty Gap		Increase as (%) of Initial Poverty Gap	
	Extreme poor	All poor	Extreme poor	All poor	Extreme poor	All poor
National	8.7	24.7	2.4	1.6	10.8%	22.5%
Urban	3.0	11.8	2.7	1.1	29.7%	57.9%
Rural	14	36.7	2.2	2.1	6.4%	17.6%

Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.

We also calculate the effect the changes in inequality. We estimate the Gini coefficient based on consumption for the national average (as all other welfare and poverty calculations in the study). Our simulated consumption distribution shows a rise in the Gini from 46.8 to 47.7 due to food price increases using our preferred real price definition. Simulated values for the alternative scenarios are reported in Annex table I.8.

How do these results compare to those from other recent evaluations of the welfare effects of rising food prices? Ivanic and Martin (2008) use a broadly similar micro-simulation approach to estimate the effects of food price increases in nine low income countries during 2005-2007. Unlike the analysis presented here, which employs complete national price data, they use changes in international commodity prices rather than national price data. They estimate that on average poverty rates have increased due to rising food prices by 4.5 percentage points. Also using a similar methodology, Robles et al (2008) take the last two years as a reference period and apply the world price increase in six products to 19 Latin American countries. They estimate that poverty has increased 2.4-10.2 percentage points if international food prices changes are considered or 0.6-11.2 percentage points if national food price changes are used for the analysis. The authors also estimate that transfers equal to more than 2 percent of total income would be necessary to avoid deepening of poverty in Nicaragua, El Salvador, and Honduras.

Dessus et al. (2008) estimate the urban poverty impact of recent food price increases and its monetary costs, using a sample of 73 developing countries. The cost is measured as the variation in financial resources required for lifting all urban poor out of poverty. This cost is decomposed into the additional monetary cost required to take poor households above the poverty line with the new prices, and the monetary cost for taking out of poverty those households below the poverty line due to prices increases. The results suggest that in most countries, the cost represents less than 0.1 percent of gross domestic product, but in countries with higher poverty rates it may surpass 3 percent.

Other studies have examined the macro effects of rising food prices. According to the IMF (2008), higher fuel prices would have a stronger adverse impact than rising food prices in middle income countries in terms of weakening the balance of payments. A combination of the two price increases leads to offsetting outcomes in some countries but mostly exacerbate the situation. Likewise, higher food and fuel prices led to considerable increases in overall inflation, particularly in low income countries. Despite not presenting estimates on poverty rates after food price increases, the report emphasize that the welfare effect on household real incomes will depend on both the direct effect of higher petroleum prices of final goods consumed by the households and the indirect effect on the prices of other goods and services that use petroleum as intermediate inputs.

The World Bank Latin America and Caribbean Region Position Paper (2008) on rising food prices presents estimated macro and microeconomic impacts from the recent trends in food prices. Simulations of the food trade balance suggest a substantial worsening in 2008 for many countries in the region which may be explained by the differences in composition of trade. The paper also explores the impact of higher food inflation on the poor. Since poor people allocate a higher share of their budget to food, higher food inflation (compared to overall inflation) would have a bigger impact on the poor's purchasing power. An estimate of the poor person's price index (PPPI) indicates an additional decline in poor's people purchasing power as high as 3.4 percentage points (Jamaica). For Honduras the estimated PPPI was 10.8 percent compared to the official CPI of 8.9 percent.

5. Conclusions

We evaluate the impact of recent rising food prices on household welfare and poverty in Honduras, using a microdata simulation approach which takes into accounts effects via consumer prices, producer income, and wages. Domestic and international prices for several products follow different, which illustrates the importance of using domestic price data as we do in our analysis.

Our preferred estimates imply that rising food prices during the period May 2007-May 2008 reduced per capita consumption for the average household by 4.8 percent and increased the headcount poverty rate by 4.0 percentage points. Impacts are largest, relative to initial consumption, for those not in the top quintile, and the poverty gap has risen much more than the headcount.

The analysis shows that although in absolute terms, less poor households are most highly affected by the rise in food prices, relative to their initial levels of consumption, poorer households experience a greater impact. In relative terms, the impact is nearly the same across the bottom four quintiles. This is due to the fact that although the very poorest feel a greater decline in consumption through consumer prices, they also benefit from the rise in agricultural wages driven by rising prices.

Annex I. Data and statistics

Annex Table I.1. Percentage Changes in Consumer Food Prices, May 2007-May 2008

Product	Price change, preferred real price definition %	Price change, alternative definition 1 %	Price change, alternative definition 2 %
Bananas	23.1	16.8	30.0
Beans	82.3	73.0	92.6
Beef liver	-3.7	-8.6	1.7
Beef steak	-4.1	-9.0	1.3
Bottled drinks	-5.3	-10.2	0.0
Bread	7.4	1.9	13.5
Butter	3.8	-1.5	9.7
Cabbage	1.2	-4.0	6.9
Cheese	12.2	6.4	18.5
Chicken meat	8.5	3.0	14.6
Coffee	8.1	2.6	14.2
Corn tortilla	21.7	15.5	28.6
Eggs	15.9	9.9	22.4
Fish	18.9	12.8	25.6
Fruit juices, packaged	-0.3	-5.4	5.3
Cassava	-0.7	-5.7	4.9
Margarine	41.6	34.4	49.5
Onion	-26.6	-30.3	-22.5
Oranges	29.1	22.5	36.4
Pasteurized milk	9.2	3.6	15.3
Plantain	14.3	8.4	20.7
Pork ribs	-0.7	-5.8	4.9
Potatoes	20.1	14.0	26.9
Rice	35.7	28.8	43.3
Salt	18.3	12.3	25.0
Sugar	-2.1	-7.1	3.4
Tomato	18.1	12.1	24.8
Tomato sauce	11.1	5.4	17.3
Dry milk	18.4	12.4	25.1
Overall Consumer Price Index Change	11.3		
Non food Consumer Price Index Change	5.6		

Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Annex Table I.2. Percentage Changes in Producer Food Prices, May 2007-May 2008

Product	Price change, preferred real price definition %	Price change, alternative definition 1 %	Price change, alternative definition 2 %
Corn	-3.1	-12.9	-8.2
Beans	131.2	107.7	118.9
Sorghum	44.2	29.6	36.6
Rice	52.5	37.0	44.4
Onion	-7.2	-16.7	-12.2
Potatoes	28.0	15.0	21.2
Cabbage	-7.7	-17.1	-12.6
Tomatoes	7.7	-3.3	1.9
Cassava	-2.3	-12.2	-7.5
Banana	30.0	16.8	23.1
Coffee	14.8	3.1	8.7
Sugar Cain	7.1	-3.7	1.4
Oranges	20.0	7.8	13.6
Plantain	29.0	15.9	22.2
Corn sub-products	33.3	19.8	26.2
Milk sub-products	4.3	-6.3	-1.2
Meat	0.3	-9.9	-5.1
Pork	3.0	-7.5	-2.5
Poultry	13.5	2.0	7.4
Eggs	37.8	23.8	30.5
Milk	15.4	3.7	9.2
Overall Consumer Price Index Change	11.3		
Non food Consumer Price Index Change	5.6		

Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Annex Table I.3. Wage Impacts of Changes in Prices of Considered Food Items

	Agricultural labor	Non-agricultural labor
Preferred definition	0.16	-0.04
Alternative definition 1	0.11	-0.03
Alternative definition 2	0.21	-0.06

Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Annex Table I.4. Impact of Food Price Changes on Consumption by Quintile through Consumer Prices, Producer Income and Wages

		Preferred Definition					Alternative Definition 1					Alternative Definition 2				
		Change in Consumption Via Impacts on					Change in Consumption Via Impacts on					Change in Consumption Via Impacts on				
Quintile	Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption
1 (Poorest)	335	-46	5	17	-24	-7.3%	-34	2	16	-16	-4.8%	-34	2	16	-16	-4.8%
2	608	-71	8	20	-43	-7.1%	-49	4	19	-25	-4.1%	-49	4	19	-25	-4.1%
3	984	-99	8	20	-71	-7.2%	-62	4	19	-39	-3.9%	-62	4	19	-39	-3.9%
4	1559	-121	5	15	-101	-6.5%	-70	2	15	-52	-3.4%	-70	2	15	-52	-3.4%
5 (Least Poor)	3636	-135	4	23	-107	-2.9%	-72	1	22	-49	-1.3%	-72	1	22	-49	-1.3%
National Average	1423	-94	6	19	-69	-4.8%	-57	3	18	-36	-2.5%	-57	3	18	-36	-2.5%

Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Monthly per capita consumption estimated using the 2004 LSMS. Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product. Households are classified by quintiles based on per capita consumption.

Annex Table I.5. Impact of Food Price Changes on Consumption by Poverty Group and Geographic Area through Consumer Prices, Producer Income and Wages

		Preferred Definition					Alternative Definition 1					Alternative Definition 2				
		Change in Consumption Via Impacts on					Change in Consumption Via Impacts on					Change in Consumption Via Impacts on				
	Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption	Consumer Prices (1)	Producer Income (2)	Wages (3)	Net Impact (1)+(2)+(3)	Net Impact as % of Initial Consumption
Extreme Poor	358	-48	6	17	-25	-6.9%	-35	3	16	-16	-4.4%	-61	9	17	-35	-9.8%
All Poor	558	-65	7	19	-39	-6.9%	-45	4	18	-23	-4.1%	-87	11	20	-57	-10.1%
Non Poor	2314	-124	5	19	-100	-4.3%	-70	2	18	-50	-2.2%	-184	8	20	-156	-6.7%
Urban	2005	-121	3	9	-110	-5.5%	-71	1	4	-66	-3.3%	-177	4	9	-164	-8.2%
Rural	881	-69	9	29	-31	-3.5%	-45	4	18	-22	-2.5%	-96	15	30	-51	-5.8%

Source: Authors' calculations based on ENCOVI, Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Monthly per capita consumption estimated using the 2004 LSMS. Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Annex Table I.6. Estimated Poverty Headcount with Impact of Food Price Changes

		Headcount with Impact of Food Prices		Increase over Initial Headcount		Increase as % of Initial Headcount	
		Extreme poor	All poor	Extreme poor	All poor	Extreme poor	All poor
Preferred definition	National	27	54.7	3.3	4.0	13.9%	7.9%
	Urban	10	33.6	3.2	6.0	47.1%	21.7%
	Rural	42.7	74.4	3.2	2.2	8.1%	3.0%
Alternative definition 1	National	25.6	52.8	1.9	2.1	8.0%	4.1%
	Urban	9	31.4	2.2	3.8	32.4%	13.8%
	Rural	41.2	72.7	1.7	0.5	4.3%	0.7%
Alternative definition 2	National	28.4	56.9	4.7	6.2	19.8%	12.2%
	Urban	11.5	36.2	4.7	8.6	69.1%	31.2%
	Rural	44.3	76.1	4.8	3.9	12.2%	5.4%

Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Annex Table I.7. Estimated Poverty Gap with Impact of Food Price Changes

		Poverty Gap		Increase over Initial Poverty Gap		Increase as (%) of Initial Poverty Gap	
		Extreme poor	All poor	Extreme poor	All poor	Extreme poor	All poor
Preferred definition	Total	8.7	24.7	1.6	2.4	22.5%	10.8%
	Urban	3	11.8	1.1	2.7	57.9%	29.7%
	Rural	14	36.7	2.1	2.2	17.6%	6.4%
Alternative definition 1	Total	8.1	23.6	1.0	1.3	14.1%	5.8%
	Urban	2.6	10.8	0.7	1.7	36.8%	1.7%
	Rural	13.2	35.7	1.3	1.2	10.9%	3.5%
Alternative definition 2	Total	9.4	25.9	2.3	3.6	32.4%	16.1%
	Urban	3.5	13.1	1.6	4.0	84.2%	44.0%
	Rural	15	37.9	3.1	3.4	26.1%	9.9%

Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

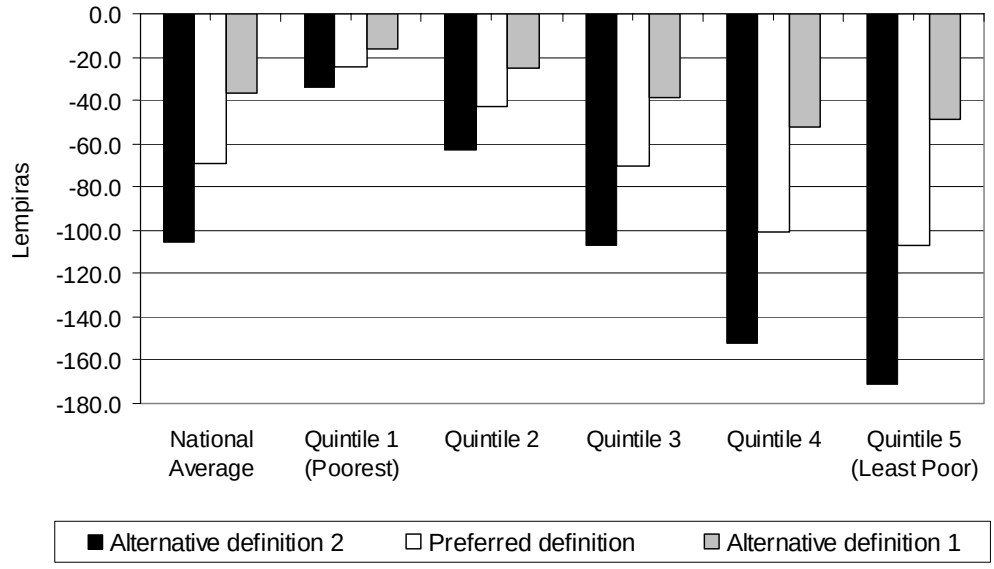
Annex Table I.8. Estimated Gini Coefficient with Impact of Food Price Changes

	Simulated Values		
Initial Value	Alternative definition 1	Preferred definition	Alternative definition 2
45.8	46.8	47.2	47.7

Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

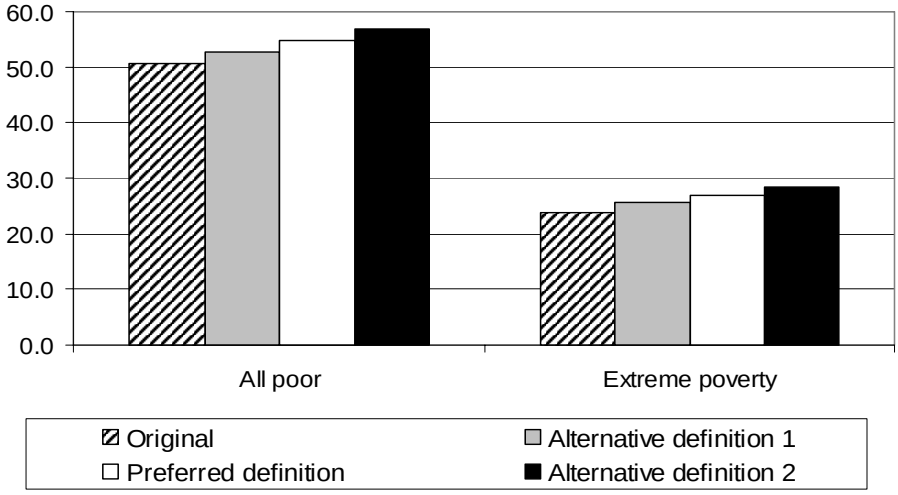
Annex II. Sensitivity of Analysis

Figure II.1. Sensitivity Analysis for Impact of Food Price Changes on Consumption by Quintile



Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

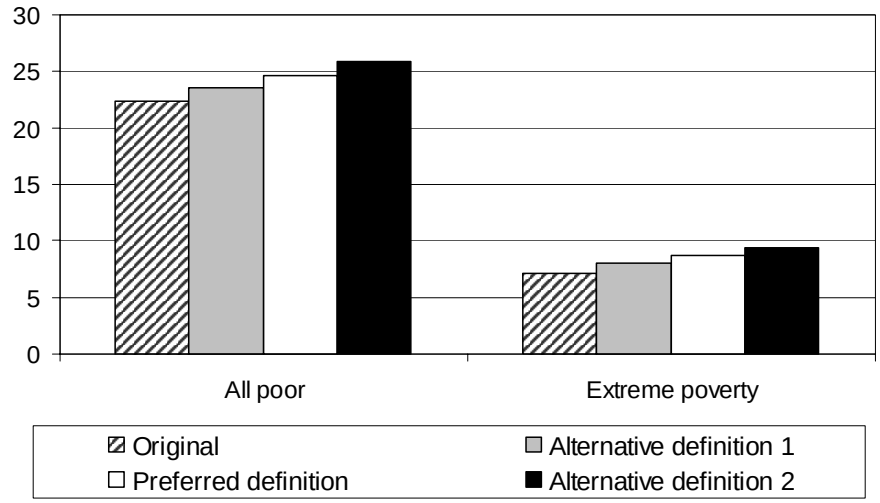
Figure II.2. Sensitivity Analysis for Full Poverty and Extreme Poverty Poverty Headcount Index



Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each

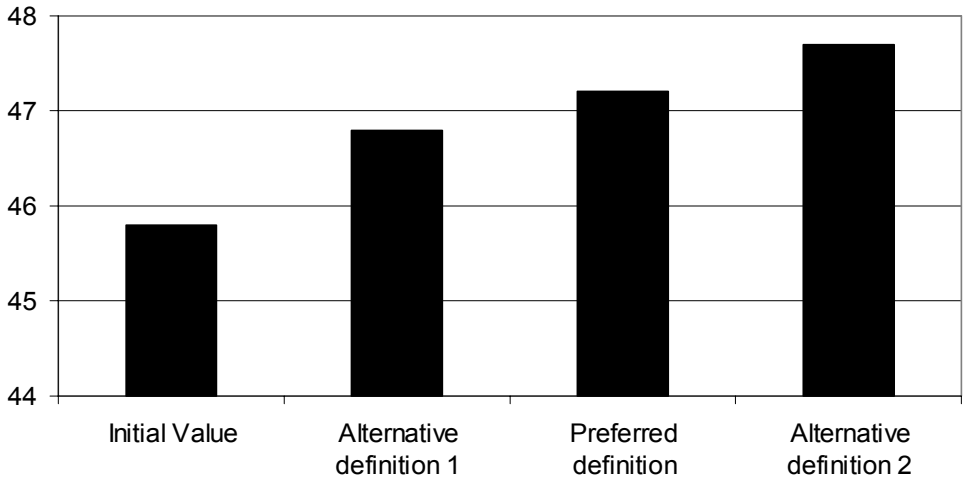
product.

Figure II.3. Sensitivity Analysis for Full Poverty and Extreme Poverty Poverty Gap



Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Figure II.4. Sensitivity Analysis for Inequality Gini Coefficient



Source: Authors' calculations based on Banco Central de Honduras and Instituto Nacional de Estadísticas.
Note: Preferred assumption corresponds to the change in the item's nominal price deflated by the Non Food Consumer Price Index; alternative assumption 1 refers to the change in the item's nominal price deflated by the overall Consumer Price Index, alternative assumption 2 is the change in the nominal price of each product.

Annex III. Impact of food prices on wages and Global Trade Analysis Project (GTAP)

The GTAP model is a multiregion, multisector Computable General Equilibrium Model. The model can be used to evaluate the impact of an exogenous shock on industrial structure, allocation of resources, income distribution and factor prices, among others.

Industries are classified into: agricultural, forestry and fisheries industry; mining industry; textiles and clothing; leather; pulp and paper; printing and publishing; metals; chemicals; transportation machinery; machinery and facilities; other manufacturing; electricity; gas; water; construction; trade and transportation; other services, etc.

Production factors are divided into three factors: land, capital and labor force. The standard GTAP model also treats natural resources as a factor of production. In addition, labor force is divided into skilled and unskilled labor for each sector. This is one of the specific characteristics of the model that allow us to develop a detailed analysis on wage impacts from the change in specific food prices.

The calculations presented in this country note include a segmented labor market specification for agricultural and non agricultural wages (unskilled labor is fixed between those two sectors). We assume, that the unskilled wage is the one relevant for the poor and that wages respond to changes in the prices of all food.

Including a condition on labor market segmentation tend to concentrate the impact of food prices on agricultural wages. As a consequence, the effect of the price change may improve household condition in those cases when they receive some income from agricultural activities. Nevertheless, according to household survey data the majority of people in Honduras are net consumers of the basket of basic food commodities analyzed in this country note and in consequence, welfare impacts may not be overestimated.

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