

Impact of staple food price changes on households

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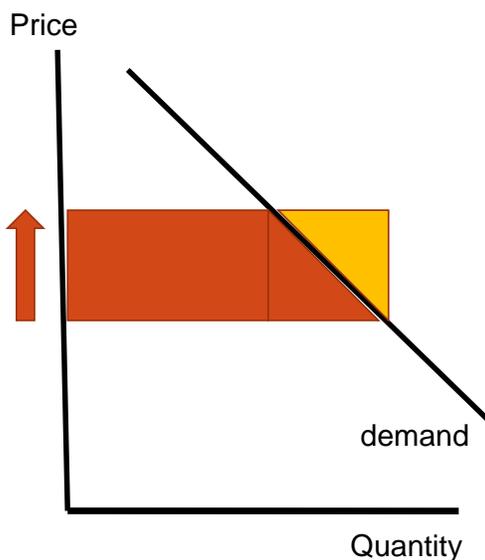
Outline

- How do price changes affect households?
- How can we measure the welfare impact?
- What is the net benefit ratio (NBR)?
- How can we use the NBR to understand the welfare impact of price changes?
- What are the characteristics of net buyers and net sellers in sub-Saharan Africa?
- Exercises

How do price changes affect households?

- Common sense tells us:
 - Higher prices of consumer goods hurt households
 - Higher prices of crops they sell benefit households
 - But
 - What about households that are mostly self-sufficient?
 - How about households that buy and sell the same good?
 - And *how much* do they gain or lose?
- Economics helps us measure the size of the benefit or loss in income

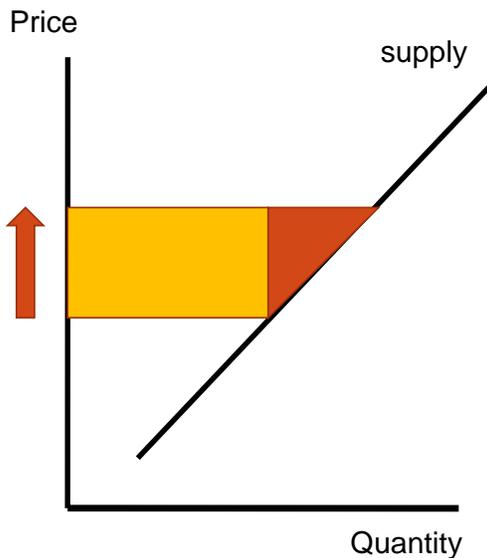
How do price changes affect households?



Case of **consumers**

- Orange area represents cost to consumers
- Orange + yellow area is approximation and easier to measure
- Welfare effect \cong negative Δ price \times quantity consumed
- Amount of additional income that would allow you to consume as much as before the price increase

How do price changes affect households?



Case of **producers**

- Orange + yellow area represents benefit to producers
- Yellow area is approximation and easier to measure
- Welfare effect $\cong \Delta \text{price} \times \text{quantity produced}$
- Amount of additional income that producer would get if there was no change in output

How do price changes affect households?

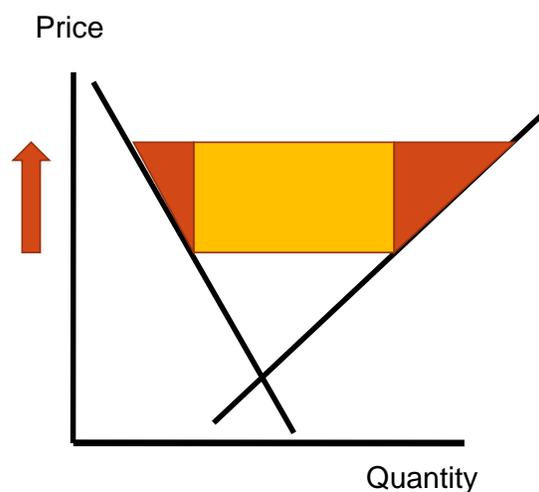
Y=income, P=price, Qd=demand, Qs=supply

$$\Delta y \cong \Delta P Q_s - \Delta P Q_d$$

$$= \Delta P (Q_s - Q_d)$$

$$= \frac{\Delta P}{P} (PQ_s - PQ_d)$$

$$\frac{\Delta y}{y} \cong \frac{\Delta P}{P} \frac{(PQ_s - PQ_d)}{y}$$



What is the net benefit ratio?

The percentage change in real income is approximately equal to the percentage change in price multiplied by the value of net sales of a crop divided by income.

$$\frac{\Delta Y}{Y} \approx \Delta P \frac{(PQ_s - PQ_d)}{Y}$$

Net benefit ratio (NBR)

The NBR is usually calculated for a crop or a crop category (e.g. cereals).

How can we use the NBR to understand the welfare impact of price changes?

Example	NBR	Effect of 50% increase in price on income
A farmer sells 4 tons of maize at \$200/ton and the household income is \$2000. So his NBR for maize = $(4 \times 200) / 2000 = 800 / 2000 =$		
A farmer produces 500 kg of maize and consumes 900 kg. The price is \$200/ton and his income is \$1600. The maize NBR is $200 \times (0.5 - 0.9) / 1600 = -80 / 1600 =$		
An urban household spends 30% of its budget on rice. His rice NBR =		

How can we use the NBR to understand the welfare impact of price changes?

Example	NBR	Effect of 50% increase in price on income
A farmer sells 4 tons of maize at \$200/ton and the household income is \$2000. So his NBR for maize = $(4 \times 200) / 2000 = 800 / 2000 =$	0.40	+20%
A farmer produces 500 kg of maize and consumes 900 kg. The price is \$200/ton and his income is \$1600. The maize NBR is $200 \times (0.5 - 0.9) / 1600 = -80 / 1600 =$	-0.05	-2.5%
An urban household spends 30% of its budget on rice. His rice NBR =	-0.30	-15%

What are the characteristics of net buyers and net sellers?

Type of household	Zambia maize	Mozambique maize	Kenya maize	Ethiopia cereals	Madagascar rice
Only seller	19	13	18	44	26
Net seller	5	*	12		
No trade	39	24	8	1	14
Net buyer	3	*	7	54	61
Only buyer	33	51	55		
Total	100	100	100	100	

* Net sellers and net buyers together are 12%

Source: Jayne et al, 2005, Tefera and Seyoum, 2008, Dorosh and Minten, 2006.

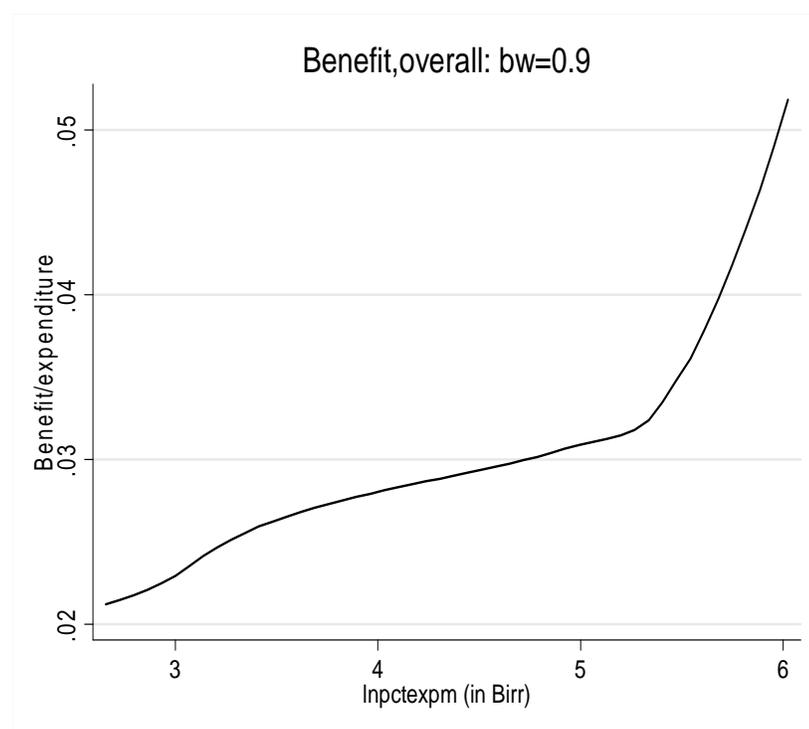
What are the characteristics of net buyers and net sellers?

Type of household	Types of households	Role in staple grain markets
Net sellers	Medium and large farmers	Small percentage of net sellers account for bulk of sales
No trade	Farmers in remote areas or farmers growing other staple crops	No role
Net buyers	Urban households, cash crop farmers, rural agricultural laborers, very small farmers	Rural demand exceeds urban demand in some cases

What are the characteristics of net buyers and net sellers?

Generally, NBR rises with income, that is, net sellers are richer than net buyers

Source: Tefara and Seyoum, 2008



Conclusions

- NBR is a useful tool for understanding effect of food price changes on households
- High grain prices usually generate benefits for rural area overall ...
- ... but benefits are concentrated among small number of net sellers, particularly large farmers
- Many (most) rural households are net buyer of the main staple crop
- Virtually all urban households are net buyers of staple crops
- Poor urban households have largest negative NBR for staples and are hardest hit by food price increases

Exercises

1. If a farmer produces \$800 of maize and consumes \$300 and household income is \$1000, what is the maize NBR for this household?
2. If maize prices fall 20%, what is the approximate percentage fall in this farmer's income?
3. Suppose a farmer produces cassava for own consumption, but does not buy or sell it. What is the cassava NBR?
4. If cassava prices rise 20%, what is the change in income for this household?

Exercises (2)

5. Open the file “AAMP Household impact.xls”
6. Calculate the NBR for maize for each household as (sales-purchases)/total expenditure:
 - MaizeP – value of purchases
 - MaizeS – value of sales
 - Hhtotexpdr – total expenditure
7. Calculate the % impact on each household of a 80% increase in maize price as $NBR \times (\% \text{ change in price})$
8. Calculate the new expenditure per adult equivalent as $(adqexpdr) \times (1 + \% \text{ impact})$

Exercises (3)

8. Calculate a dummy variable indicating households that were poor **before** the price change using poverty line of 17,000 Ksh/adult equivalent using $=if(adqexpdr < 17000, 1, 0)$
9. Calculate a dummy variable indicating households that were poor **after** the price change using poverty line of 17,000 Ksh/adult equivalent using $=if(newadqexpdr < 17000, 1, 0)$
10. Calculate average poverty rate before and after the price change