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Lecture 4: Is there a nutrition based poverty trap?

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February 16, 2010

Last time we saw that the elasticity of calorie consumption with respect to income was relatively low. Deaton and Dreze estimate=0.37

However, this may be an overestimate, since this does not take into account difference between people, or endogeneity. Ideal experiment: provide income randomly to some people and see what they do with it. We don't have such an experiment.

However, the results of the Jensen-Miller experiment suggests that the income effect on calories may even be negative in some context! Why?

By revealed preference, this suggests that it is not very likely that adults feel trapped inside a nutrition based poverty trap—Why?

1 The effect of nutrition on productivity

1.1 A look at calories

John Strauss: wants to look at the effect of calorie consumed on the productivity of labor. The set up: farmers in semi-arid sierra Leone. Where we would expect the strongest effect of nutrition on productivity.

Ideally would like to run $\text{productivity} = f(\text{calories consumed})$.

But what is the obvious problem?

So he solves the problem by using an *instrument*. We will discuss in much more details in a future lecture what an instrument does. But the basic idea is to regress calorie on the price of

food (and he does find that in Sierra Leone, people eat less calories when the price of food goes up), and then regress individual $\log(\text{productivity})$ on the $\log(\text{predicted calories})$.

What he finds:

A nice inverted L-shape curve, where the maximum elasticity is may be 0.4.

If we go back to the calculation we did last time: product of the highest possible estimated elasticities= $0.4 \times 0.37 = 0.16$. Which is much less than 1... The mechanism in Das Gupta and Ray does not seem to be at play, for most people, in most region.

So can we say there is no nutrition based poverty trap?

1.2 Other nutrients

However, there are other forms of undernutrition, except for calorie deficiency. “Hidden hunger”=micro-nutrient deficiency.

One very frequent one is iron deficiency anemia (WHO estimates that 2 billion people suffer from anemia worldwide, and perhaps half of them from iron deficiency anemia).

Experiment in Indonesia: randomized experiment where households were randomly assigned to either treatment) (iron supplement) or control (placebo)

Key results:

- People who were anemic at baseline were less likely to be anemic at endline if they got the supplement than if they got the placebo
- People who were anemic at baseline earned more money if they got the placebo than if they got the placebo: Increase corresponds to a \$40 yearly increase for self employed workers.
- People were also happier
- However there was no effect on the earnings of the people who worked for a wage.

For the self employed: the extra earnings (\$40) are much more than the cost of iron-fortified fish sauce (\$6). If it is really poverty that stops them to buy the fish sauce, then we can say there is a poverty trap (based on iron, not calories). And if people are sufficiently more likely to buy fortified fish sauce, meat, or other iron-rich food when they are richer, then there may be a nutrition based poverty trap.

But given the price of fortified fish sauce, what is puzzling?

1.3 Nutrition during childhood

Nutrition during adulthood is in large part a short term investment: eat better today, be more productive tomorrow. However, nutrition during childhood is likely a long term investment.

Why?

Experiments that follow children over time demonstrate the importance of this effect:

- INCAP in Guatemala. Children were provided with protein rich drink in a few villages, randomly selected. As adults they were more educated.
- Deworming : we will spend more time on this next lecture. Children dewormed for about 3 years as children had more education, higher test scores, and earned 20% more than comparable children dewormed for just one year.

1.4 Nutrition in utero

Growing literature to show that conditions of life in utero affect outcome throughout life.

- Famine in China (Almond, Qian)
- Siege in Amsterdam
- Flu epidemics (Almond et al.)
- Ramadan fasting (Almond et al.)
- Iodine supplementation of pregnant mother in Tanzania (Field and Torero)
- Chernobyl cloud (Almond et al.)

All this indicates that good nutrition of the pregnant mother would reduce in life time earning and health gains for the child. Most governments try to provide iron during pregnancy, but a large number of women still do not take it regularly.

2 Why are the poor not eating better?

2.1 The role of the labor market

In the lecture on poverty trap, we have assumed that people worked for a piece rate. However many people work for a daily rate. Perhaps people do not really benefit from an increase in productivity if they work for a daily rate, and the employer cannot directly verify how much more productive people are.

If that is the case, then employees have no incentives to consume more calories/more iron.

2.2 The role of information

Iron makes you stronger, but does not transform you into superman. Even harder probably to link your child's future outcome to how well his mother ate. In India, many people believe that pregnant women should not eat too much, in order to make space for the baby!

2.3 The role of consumption choices

- The quality of food matters: immediate gratification that may be necessary to get going.
- Other things people do with money
 - Social expenditure
 - Other consumption items: entertainment, etc. may be just as important to life...
 - They are real choices, not “impulse purchases”. How do we know that?

2.4 Conclusion

People are not machines: they maximize utility, not productivity. You cannot expect them to put a lot of thoughts and deprive themselves of what they like to eat more healthily, particularly since eating healthily is much more than just about calories.

Policy needs to take this into accounts:

- Make feeding children and pregnant women easy
- Pack food people like to eat, and normally eat, with nutrients (e.g. double fortified salt)
- Policy that delivers

3 Whatever is happening to food prices?

Food prices have increased in the year 2005-2008, then fallen with the food prices, and have started to increase again.

The reasons for the increase in food prices:

- Raise in demand from China and India (and switch to calories that are harder to grow).
- Raise in demand from biofuel
- Raise in the cost of production (due to raise in petrol prices, and hence in the cost of fertilizer)
- Krugman's argument (in NYT column): weather events: an indication of what is to come with global warming.

Can we just believe Krugman's claim:

A test in Guiteras (2009). Uses past temperatures in India to measure the impact of temperature on yield. High degree days are bad: it suggests that an increase in the number of high degree days will be bad for productivity.

Use global warming scenario to predict what will happen to Yield in India, and find large effects.

Krugman argues that a small change in Yield can lead to a large change in prices. Why is that?

The price volatility may hurt the poor more than the high prices. Why?

All of this could matter a great deal:

Burgess, Deschenes, Donaldson, Greenstone use the same methodology and find that in years when there are many hot days, people are more likely to die: without adaptation the climate change, climate change would cause many more deaths in India.

This appears to be due to loss in wages, rather than diseases: lower wage when it is hot in growing season. Effect is only in rural india, not urban.