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Calories and poverty during a prolonged crisis

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ABSTRACT

We study how calorie intake changes during prolonged crises, by studying the calorie intake of households when exposed to short-term and long-term income and price shocks. We use data from household surveys of Mexican households during the income and price crises periods of 1994 to 1998 and 2006 to 2010. Our focus is on low-income Mexican households, those with the lowest 25% of expenditure per capita. There is little effect on calorie intake following an income decline in the short run. Once households are exposed to reduced incomes for a longer period, calorie intake falls. Households are able to weather short-term fluctuations in income by shifting consumption to food items that are cheaper per calorie, such as staple foods, by consuming more foods at home instead of outside the home, and by postponing expenditures on durable and semi-durable goods. When exposed to the income shock over a longer period of time, we posit that households are not able to defer durable and semi-durable purchases any more so their calorie consumption drops. Our results suggest that Mexican households may be able to sustain calorie intake when faced with an income shock, but it is less likely that they are able to do so if the income shock persists. The government may want to support poor constituents when they are faced with prolonged crises.

1. Introduction

This paper studies calorie intake of poor households who face one or more economic shocks that continue over a long time period. We provide empirical evidence of what happens when consumption destabilizes because of a fall in income or because of an increase in the price of staple foods, without experiencing a famine like those discussed by Sen (1981) or Ravallion (1997). We focus on the poorest 25% of Mexican households and two periods of analysis, the 1994 economic crisis in Mexico and the 2008 world food price crisis, although in both periods both income and price shocks are experienced simultaneously.

To study nutrient consumption over prolonged crises, we employ six cross-sectional surveys and two time periods: 1994–1996–1998, and 2006–2008–2010. During the first period Mexico went through a severe economic crisis that started at the end of 1994 and whose effects extended until at least 1998. We consider 1994 the pre-crisis year and 1996–1998 years in which the effects of such crisis could potentially be found. With respect to the second period, the crisis starts in 2008 with the world food price crisis, which is followed in 2009 by the world financial crisis. Hence, we consider 2006 the pre-crisis period and compare it to 2008 and 2010 to gauge the effect of the crisis on households. Therefore, we study the impact on nutritional intake of not only income shocks but we also consider shocks to prices of food.

It is important to understand how households' calorie intake is affected by economic shocks, as the idea that it is desirable for governments to support the poor during periods of economic crisis is not only based on equity reasons but also on efficiency. It is argued that a fall in nutritional levels affects long term productivity, especially when it affects expectant mothers or young children. Nutritional deficiencies in households are also related with a lower productivity at work (Strauss, 1986; and Haddad and Bouis, 1991). The study of how nutritional intake changes with economic (income and price) shocks has important implications for public policy. Empirical evidence on this topic, however, is somewhat mixed.

Although some studies find positive food-income elasticities, and negative food-price elasticities, when studying the relationship between income and nutrients, like calories, and between prices and nutrients, they find that such elasticities are close to zero or of the opposite sign. This occurs because when income falls or prices go up, there is a substitution towards foods that are cheaper per calorie. For instance, Behrman and Deolalikar (1987); Bouis and Haddad (1992); Stillman and Thomas (2008); and Skoufias et al. (2009) find that a fall in income does not affect calorie intake in the case of south Indian rural households, Phillipine farm households, Russian households, and rural Mexican households, respectively. Changes in prices of food also appear not to affect calorie consumption (Behrman and Deolalikar, 1988), and

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a fall in the price of basic foods could even reduce calorie intake (Jensen and Miller, 2011; and Kaushal and Muchomba, 2013) or show Giffen behavior (Jensen and Miller, 2008). On the contrary, other studies, such as Subramanian and Deaton (1996) find positive income elasticities for the demand for calories which are small but significantly different from zero in the case of rural Indian households, which implies a deterioration in calorie intake given a negative economic shock. However, there is little evidence on the effects of such economic shocks on nutritional intake when the shocks persist over longer periods of time.

Eventhough Stillman and Thomas (2008) also distinguish between short and long term effects when studying the crisis in Russia between 1995 and 1998, their analysis is different, since the Russian economy recovered by the year 2000. We focus on what happens when the crisis extends for two more years. Additionally, the study of Thailand in 1997 (Frankenberg et al., 2003), and Indonesia (Frankenber et al., 1999) focus on the effects of a crisis without discussing what happens when the crisis extends.

The short term impact on Mexican households' consumption during economic crises has been studied in the literature. McKenzie (2006) finds a significant change in the consumption patterns during the 1994–1996 time period, with an increase in consumption of staples and other foods, even though food prices during this period increased by more than the overall consumer price index. The evidence suggests that households were postponing durable and semi-durable purchases including primary health care (McKenzie, 2003) which could have led to an increase in infant and older-adult mortality as found in Cutler et al. (2002). When studying the nutritional intake over time for Mexican households, Valero-Gil and Valero (2013) observe a drop in intake between 1992 and 1996, and between 2006 and 2010.

Our evidence suggests that when faced with a crisis, poor Mexican households initially adapt and maintain their calorie consumption, substituting between foods and increasing the percentage of household expenditure disbursed to food. In particular, households shift consumption towards foods that are cheaper per calorie, i.e. staple foods, and consume more food at home and less food outside the home which is more expensive per calorie. Additionally, they postpone expenditures on durable and semi-durable goods. However, after a longer period of time over which the crisis extends we find a fall in calorie intake among poor households. Although we do not observe a significant calorie drop in the short run for the full sample, we find a fall in calorie intake in the short run for poor households in urban areas during the food price crisis, and then a further drop in calorie intake in the long run for this group.

The paper contributes to the literature in that we look at calorie intake of poor households under very particular circumstances, that is, when faced with a prolonged crisis. Our study suggests that the intake of the poorest Mexican households is initially resilient during economic crises but that it suffers once the crisis lengthens. Additionally, we look at the effects on poor households in both urban and rural households. The study of urban households is important as poverty seems to be disproportionately increasing in urban populations compared to rural populations[1] (Chen and Ravallion, 2007). We find decreased intake of poor households during prolonged crisis in the case of households in urban areas also. Finally, our paper helps establish a link between the literature that finds that calorie consumption does not change or decreases by little when a poor household faces a negative shock in income or an increase in the price of staple foods, and the observations of famines such as those documented by Sen (1981) or by Ravallion (1997).

The paper is structured as follows. In Section 2, we discuss the relation between staple foods, non-staple foods and other non-food necessities in the presence of subsistence concerns. Section 3 discusses the data and methodology used to evaluate household nutritional intake. Section 4 studies the expenditure patterns of households over the two periods studied. Section 5 studies the changes in calorie intake of households, and the food consumption patterns of households are studied in Section 6. Section 7 presents estimates of nutritional poverty. The final section concludes.

2. Staple foods, non-staple foods, durable and semi-durable goods in the presence of subsistence concerns

Our study considers an economy with three types of goods. First, food goods from which we obtain the cheapest calories, we call these staple foods and denote them with x_1. The second type of goods is the rest of the foods which are more expensive per calorie, we denote them with x_2. And third, we consider non-food necessities, denoted by x_3, which refer to durable and semi-durable goods which are necessary for individuals.

We also suppose two types of restrictions. First, a minimum amount of calories is required for subsistence and the behavior of individuals will change when they approach such minimum. Second, a minimum of services from the durable and semi-durable goods is also required, for instance, the individual will need a minimum of health care, dwelling, and clothing.

As the wealth of the individual decreases, his consumption of all three types of goods will fall. However, less-wealthy individuals, the ones facing the calorie restriction, will need to meet their caloric needs and therefore will reduce their consumption of x_2 and x_3, (vegetables and health care, for instance), and increase their consumption of x_1 (beans and corn tortillas for instance). They shift to consume cheaper per calorie goods instead of goods that are more expensive per calorie so that they can meet caloric needs. Therefore, it is possible to observe that even though income falls calorie consumption does not fall, as suggested by Behrman and Deolalikar (1987) and Skoufias et al. (2009).

If, on the other hand, it is the prices of staple foods x_1 that increase, as with the prices of basic foods between 2006 and 2008, then given the increase in the price of staple foods the individual will tend to reduce consumption of staples, x_1, and increase consumption of non-staple foods, x_2. However, individuals at low levels of intake that face the calorie restriction may not be able substitute by increasing the consumption of x_2 since it is more expensive per calorie, and may instead try to maintain constant their consumption of staples, x_1 by reducing their consumption of durable and semi-durable non-food necessities, x_3. Although we find that the price increase reduces x_1 and the total consumption of calories in the case of poor Mexican households, other studies, such as Jensen and Miller (2011) for the case of poor households in China and Kaushal and Muchomba (2013) who study poor households in India, find that a fall in the prices of staple foods (x_1) has a negligible effect or could even reduce calorie intake.

There are two alternatives to explain why calorie consumption may fall in the long run (or a prolonged crisis). One is that calorie consumption falls as the individual adapts to a lower calorie intake as postulated by Sukhatme and Margen (1982). The other would be that as the crisis prolongs, the services provided by good x_3, such as health care and clothing, deteriorate, and the second restriction kicks in, requiring an increase in the consumption of these goods. As an individual's consumption of the non-food necessity increases, the expenditure on food as well as the calories consumed would tend to fall. Intuitively, if the individual lowers his consumption of a non-food necessity, such as healthcare, on one period, he may face a higher minimum required for subsistence the next period. The minimum amount that needs to be consumed depends on how much of the good was consumed in the past period. Further, one can only postpone expenditures on these items for so long until one has to invest in them again. For instance, an individual could consume below the minimum amount of healthcare or housing in

[1] In the case of Mexico for the time period studied, 1994 to 2010, the number of people in food poverty increased by 2,186,000; increasing by 3,119,000 in the urban sector while decreasing by 933,000 in the rural sector (CONEVAL (2014, Table 1).