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Food Prices and Household Welfare: A Pseudo Panel Approach

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FONDATION POUR LES ÉTUDES ET RECHERCHES SUR LE DÉVELOPPEMENT INTERNATIONAL

Food Prices and Household Welfare: A Pseudo Panel Approach*

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LA FERDI EST UNE FONDATION RECONNUE D'UTILITÉ PUBLIQUE. ELLE MET EN ŒUVRE AVEC L'IDDRI L'INITIATIVE POUR LE DÉVELOPPEMENT ET LA GOUVERNANCE MONDIALE (IDGM). ELLE COORDONNE LE LABEX IDGM+ QUI L'ASSOCIE AU CERDI ET À L'IDDRI. CETTE PUBLICATION A BÉNÉFICIÉ D'UNE AIDE DE L'ÉTAT FRANÇAIS GÉRÉE PAR L'ANR AU TITRE DU PROGRAMME « INVESTISSEMENTS D'AVENIR » PORTANT LA RÉFÉRENCE « ANR-10-LABX-14-01 »

The last decade has seen a stark increase in world food prices and food price volatility. From the year 2000 until 2011, food price levels and volatility have more than doubled. Previous research on this topic has concentrated on the effect of high food prices and has confined its analysis to specific regional and time contexts. This essay attempts to makes two contributions to the literature. First, the analysis distinguishes between permanent shocks (trend), volatility, short- to medium-term changes and sustained episodes of hikes and drops in prices.[1] By doing so, the estimated effects can be attributed to specific components of food price variation. Second, the analysis extends the regional and time perspective. By relying on a pseudo panel approach, an idea first introduced by Deaton (1985), survey data from 38 countries spanning over a period of 20 years can be put to use.

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1. See review of literature by Von Braun et al. 2012.

• • • /• • • The empirical analysis combines macroeconomic information on global food prices from the International Monetary Fund (IMF) and the World Bank (WB) with household-level microeconomic data from the Demograhic and Health Surveys (DHS). This results in a pseudo panel containing information on 38 countries during the period from 1991 to 2011. In the pseudo panel approach, cohorts defined on the basis of a time-invariant characteristic are followed over time. The resulting pseudo panel of cohort means may, therefore, suffer from measurement error. To address this issue, an errors-in-variables (EIV) model is applied based on Deaton (1985) and Verbeek (1992). The choice of the appropriate estimator and cohort definition is guided by Monte Carlo Simulations (MCS) which suggest that the Verbeek (1992) estimator is the best choice for the prevailing data situation.

Based on this methodology, the analysis finds that the fluctuation in global food prices over the mentioned period had a negative impact on household welfare in developing countries. The impact is transmitted through the long-term price trend, short-term changes in prices as well as volatility. There are mixed results on the impact of short-term fluctuations around a trend and episodes of sustained drops in food prices. To illustrate the magnitude of the above effects, the essay puts the parameter estimates in relation to the effect size of education on child health and estimate the impact of the above food price indicators on the rate of child malnutrition.

Overall, increases in the global food price index have a negative impact on household welfare. The effect size is economically significant: when compared to the effect size of maternal education, the observed price increase from the year 2000 to 2010 would offset the positive effect of 3.5 years of maternal education. It is also illustrative to calculate the effect in terms of child malnutrition rate (children who fall below a WAZ < -2 SD): the price increase over the same period leads to a 1.5 per cent increase in the rate of child malnutrition in the countries sampled. To trace further how food price variation affects the households in developing countries, the analysis is run based on six decompositions of the original index.

Decomposing the index in the above components, the negative effect operates through volatility, as measured by the CoV, the change in prices from one period to another, the HP trend and episodes of sustained increases in prices. The effects can be considered strong when set in relation to maternal education and malnutrition. The effect of price volatility (CoV) in the year 2008 on child WAZ corresponds to -3.6 years of maternal education and an increase in malnutrition by 2.2 per cent. Given that this effect corresponds to only one year, the effect size can be considered high. Contrary to the CoV, the impact of the HP Trend materializes over a rather long period of time: the increase in HP Trend from 2000 to 2010 is equivalent to the effect of -4.8 years of maternal education and translates in an increase of malnutrition by 2.1 per cent. Living through a period of continued price increases[2] corresponds to the effect of -3.5 years of education or a 1 per cent increase in malnutrition.

There is mixed evidence on the impact of the short-term fluctuation around a trend (HP Filter) and whether continued decreases in prices improve child health. While the coefficient estimates based on the IMF's nominal food price index are insignificant, the estimates based on the World Bank's index in both nominal and real terms are significant. According to the latter results, the variation in the HP Filter has a negative relation with child WAZ: the effect of the maximum deviation from trend in the year 2008 corresponds to -2 years of maternal education and implies an increase in malnutrition by 1 per cent. Based on the World Bank data, periods of subsequent drops in food prices seem to improve

2. Periods of continued price increases are defined as two or more subsequent upward movements in prices. Periods of sustained drops in prices are defined analogously.

child health: the effect size corresponds to 6.5 years of maternal education, or a 1.5 per cent decrease in malnutrition.

To summarize, there is an overall negative relationship between the variation in global food prices and household welfare. The effect is transmitted through short-term price movements (volatility), medium-term changes (period-to-period change, HP Filter) and permanent shocks to global food prices (HP trend, price hikes). The effects on household welfare are strong considering equivalent education effects and estimated effects of the above indicators on malnutrition rates.

The above analysis shows that policy makers should not only be concerned with the effects of high food prices, but also consider other components of food price variation, in particular volatility, when designing policies and programs which aim to remedy negative effects of food price fluctuations on households in developing countries.

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