



Inflation dynamics and food prices in Ethiopia

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ABSTRACT

During the global food crisis, Ethiopia experienced an unprecedented increase in inflation, among the highest in Africa. Using monthly data over the past decade, we estimate models of inflation to identify the importance of the factors contributing to CPI inflation and three of its major components: cereal prices, food prices, and non-food prices. Our main finding is that movements in international food and goods prices, measured in domestic currency, determined the long-run evolution of domestic prices. In the short run, agricultural supply shocks affected food inflation, causing large deviations from long-run price trends. Monetary policy seems to have accommodated price shocks, but money supply growth affected short-run non-food price inflation. Our results suggest that when analyzing inflation in developing economies with a large food share in consumer prices, world food prices and domestic agricultural production should be considered. Omitting these factors can lead to biased results and misguided policy decisions.

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1. Introduction

Global commodity prices have been on the rise. They reached record levels in 2008, declined during the financial crisis, but then rose sharply in 2010–2011. In mid-2012, commodity food prices rose even further, surpassing the peak in 2008.¹ As a result, several low-income countries are experiencing high price levels, trade deficits, and unstable macro-economic environments. As there has been great variation in domestic food price developments across countries, our understanding about transmission patterns remains elusive (Baltzer, 2013). Yet high commodity prices, particularly for food, clearly have adverse effects on poverty in countries with large fractions of net food-buyers (Wodon and Zaman, 2010).

Several studies have attempted to address the underlying causes of the global price rise, typically identifying a combination of factors – ranging from long-term economic and demographic trends combined with short-term problems, such as bad weather, speculation, high oil prices, and export bans in a number of countries.² At the same time,

we know less about how world food prices affect domestic food prices in individual developing countries; particularly in Sub-Saharan Africa (see Minot, 2010).

One of the most affected countries is Ethiopia, which, with the exception of Zimbabwe and some small island economies, had the strongest acceleration in food price inflation in Sub-Saharan Africa (IMF, 2008a, 2008b; Minot, 2010). At the peak of the global food crisis, in July 2008, annual food price inflation surpassed 90%. This was a historically unprecedented rise, which began in 2006.

There is no consensus on why Ethiopia experienced such dramatic food price rises. The increase in inflation coincided with relatively favorable harvests, whereas in the past inflation had typically been associated with agricultural supply shocks due to droughts. World food price increases are believed to have small effects in Ethiopia because of the limited size of food imports, which amounts to about 5% of agricultural GDP. Minot (2010), for example, finds that out of the three staple food prices analyzed, one is affected by world market prices (wheat), but the transmission from world prices is negligible. Instead, the chief explanations have focused on domestic demand, expansionary monetary policy, a shift from food aid to cash transfers, and structural factors due to reforms and investments in infrastructure (Ahmed, 2007; IMF, 2008c; Rashid, 2010).

Nonetheless, few studies, if any, attempt to identify the relative importance of the factors driving inflation. The purpose of this article is to fill this gap of information by estimating a model of inflation for the period January 2000–December 2009, and by using data up to December 2012 for forecasting to check for robustness.³ We use general-to-specific

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¹ The price increases vary across commodities and data sources. The annual Commodity Food Price Index of the World Bank's Development Prospect Group rose by 13.2% in 2004, declined somewhat in 2005, and then rose by 10.0, 25.6 and 34.2% in the following three years. In the middle of 2008, the index started to decline and by March 2009, it was at the same level as in mid-2007, which is almost twice as high as the average value in 1999–2003. It then rose by close to 50%, peaking in February 2011. The index declined slightly from early 2011 to June 2012 but rose sharply in July 2012, surpassing the previous peak (World Bank, 2012).

² Baffes and Hanjotis (2010) provide a survey and extensive list of references.

³ Most of the data used for forecasting were not available when the models were developed.

modeling and estimate single-equation error correction models (ECMs) for the Consumer Price Index (CPI) and three of its major components: cereal, food and non-food prices. By developing measures of deviations from equilibrium in the money market, external sector, and agricultural market, we evaluate the impact on inflation of excess money supply, changes in food and non-food world prices, and domestic agricultural supply shocks. Agricultural markets can thus affect inflation both through the transmission of international food commodity prices and through changes in domestic food supply and demand. This approach can be viewed as a general (hybrid) model that embeds other models of inflation, allowing us to test various hypotheses, and account for the specific circumstances of developing economies with a large agricultural sector and a large share of food consumption expenditures.

One potential shortcoming of the single-equation approach is that we cannot measure indirect effects, for instance, how prices affect the exchange rate. Moreover, the equilibrium relationships are not estimated jointly, but are specified individually. Nonetheless, an important finding is that the parameters of the ECMs are empirically stable over the sample, indicating that the single-equation approach is adequate.⁴

Our results show that inflation in Ethiopia is closely associated with agriculture and food in the economy, and that the international food crisis had a strong impact on domestic food prices. The external sector largely determines inflation in the long run (about three to four years). Specifically, domestic food prices adjust to changes in world food prices, measured in local currency (birr), and non-food prices adjust to changes in world producer prices. There are large deviations from long-run equilibrium food prices, mainly due to the importance of the domestic market for agricultural products; domestic food supply shocks have a strong effect on inflation in the short run (about one to two years). These findings, however, do not imply that domestic and world food prices are always close to each other. They show that prices do not drift too far apart, which is consistent with observed price fluctuations of domestic prices between import and export parity bands. The evolution of money supply does not affect food prices directly, though money supply growth significantly affects non-food price inflation in the short run. It is possible that excess money supply affects the exchange rate, and thus inflation, which is not analyzed in this article. However, the birr-US dollar exchange rate is heavily managed by the central bank, so a possible link to money supply would be loose in the long run, and challenging to detect using empirical analysis.⁵ Nevertheless, a central finding of the article is that world food prices clearly had a strong impact on inflation during the study period.

A major contribution of the article is to take into account specific circumstances of a developing country with a large agricultural sector. Most studies on inflation ignore domestic agriculture, and very few studies, if any, include international commodity markets in their analysis. In turn, studies on the transmission of world food prices to domestic food prices usually focus on individual prices and ignore the macroeconomic context. Finally, almost all previous studies on inflation in Africa model the CPI only, even though the weight of food in CPI is often very large, and the dynamics of food and non-food prices can differ considerably.

Another contribution of the paper is to show that it is possible to develop informative empirical models for an African country using monthly time series data for a relatively short period, provided that there is a reasonably well-defined policy regime. This challenges the view that major economic reforms throughout Africa, in combination

with large external shocks and weak national statistical agencies, make it challenging to learn from empirical macro-models.

Section 2 gives a short description of Ethiopia's recent macroeconomic performance, and then outlines popular hypotheses of the causes of Ethiopia's inflation trajectory. Section 3 provides the theoretical framework, formulates the empirical model, and discusses how various hypotheses are tested. Section 4 describes and analyzes the money market, external sector, and agricultural market, with the purpose of formulating explanatory variables for the inflation models. Section 5 develops the final models and carries out robustness checks, including forecasting. Section 6 discusses major findings, and Section 7 concludes.

2. Inflation in Ethiopia: Background and previous studies

2.1. Economic performance and inflation

In recent years, Ethiopia's economy has expanded rapidly: according to official data, GDP growth averaged 11.7% between 2004/05 and 2010/2011. Agriculture, which accounts for over 40% of GDP and nearly 85% of employment, grew by 8.4%. In spite of this, about 30% of Ethiopia's 84.7 million people lived below the official poverty line in 2011 (Government of Ethiopia, 2012), but it is likely that an even larger proportion have experienced extended periods of poverty due to shocks (Bigsten and Shimeles, 2008). The rise in food inflation, for instance, is likely to have increased urban poverty (Alem and Söderbom, 2012).

Historically, Ethiopia has not suffered from high inflation. The annual average was only 5.2% 1980/81–2003/04, and major inflationary episodes occurred only during conflict and drought. Annual average inflation reached a record of 18% during 1984/85 because of drought, 21% in 1991/92 at the peak of civil war, and again 16% during the 2003 drought.

Figs. 1 and 2 depict the major trends in inflation during the current decade, January 1999–July 2010, by showing the annual growth rates of the CPI and its major components: food, cereals, house rents, construction, materials, energy and other non-food prices. Table 1 gives a list of the CPI weights.

The importance of fluctuations in food prices for the overall CPI is clearly visible in Fig. 1. The deflation in 2001–2002 was due to good harvests and significant amounts of food aid inflows. There is a rapid increase in inflation induced by the 2003 drought, another increase around 2005, and an almost exponential price outburst in 2008. There was also a hike in non-food inflation during 2005–2007. Overall, it is evident that food and non-food inflation behave very differently, indicating that they should be analyzed separately.

As food accounts for 57% of total household consumption expenditure, low food and CPI inflation are associated with adequate rainfall and good crop harvests. However, this link seems to have been absent during 2004/05–2008/09, since food inflation continued to accelerate despite good weather and favorable agricultural production patterns. It is notable that annual food inflation, measured in simple growth rates, rose from 18.2% in June 2007 to a peak of 91.7% in July 2008. Food inflation then started to decline, and during the latter half of 2009 there was even deflation.

Fig. 2 depicts food price inflation divided into its various components. Despite a short hike of spice inflation in 2007, it is obvious that cereal price inflation accounts for most of the fluctuations in food prices. It is also the most important component of the food-price index; its weight in the CPI is close to 23%. The two graphs thus give an early indication of the key role played by food prices in general, and by cereal prices in particular, in Ethiopia's overall inflation dynamics.

2.2. Review of studies on inflation in Ethiopia

A few studies have emerged in the light of Ethiopia's food price crisis, drawing mainly on logical deductions and descriptive analysis. We subsequently review the most important ones.

⁴ We also estimated systems of ECMs that included money and the exchange rate, and the values and standard errors of the parameters of interest only changed marginally. The results are available on request.

⁵ We tested if the rate of change of the birr-dollar exchange rate is affected by excess money supply, measured by the error correction term used in Table 4. This was not the case. The results are available from the authors on request.

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