

Food Aid and Poverty

Barrett E. Kirwan and Margaret McMillan

One of the primary objectives of food aid is poverty alleviation. This is true independent of the type of food aid (see Barrett 2007 for an excellent overview of the various types of U.S. food aid). Advocates of food aid argue: it is an effective means of reducing hunger; when used for food for work programs, it stimulates development; and by reducing the need for food imports it has prevented large cumulative deficits in poor countries. Critics of food aid argue it has increased the dependence of developing countries on food imports. The dumping of surplus production for free or nearly no cost to poorer nations means that the farmers from such countries either cannot produce at competitive prices, or lose the incentive to produce entirely (leading, over time, to the deterioration of the infrastructure of production). They also claim that food aid is inefficient – it often fails to reach the most needy and has high administrative costs.

However, credible empirical evidence on the role of food aid in combating poverty is limited. Levinsohn and McMillan (2006) use nationally representative household survey data from Ethiopia to identify the relationship between household

Kirwan: Department of Agricultural and Resource Economics, University of Maryland, 2120 Symons Hall, College Park, MD 20742. bkirwan@umd.edu. McMillan: Department of Economics, Tufts University, National Bureau of Economic Research, 304 Braker Hall, Medford, MA 02155. margaret.mcmillan@tufts.edu

income and household wheat sales and purchases (the cereal most commonly distributed by food aid programs). They find:

- (i) Net buyers of wheat are poorer than net sellers.
- (ii) At all income levels there are more buyers of wheat than sellers. Only 12% of Ethiopian households sell wheat.
- (iii) The net benefit ratios are higher for poorer households, indicating that poorer households benefit proportionately more from a drop in the price of wheat.

Levinsohn and McMillan also undertake a welfare analysis of food aid in Ethiopia. They treat the Ethiopian wheat market as a partial equilibrium in a closed country, which received extra wheat via food aid. They observe the actual price (with the wheat aid), and then calculate a counterfactual wheat price that they believe would have held, given some posited elasticity of demand, absent food aid. Finally, they calculate the distributional effects under the counterfactual price and conclude the poor were typically better off with the low (with food aid) price. Based on these findings, they conclude that Ethiopian households at all levels of income potentially benefit from food aid, and the benefits of food aid go disproportionately to the poor.

A serious limitation of this analysis is its failure to address the long term impact of food aid on production and consumption patterns. Ideally, we would extend Levinsohn and McMillan by examining net benefit ratios along the Ethiopian income distribution pre- and post-food aid. This would tell us whether the provision of food aid was associated with households changing from net producers of wheat to net consumers of

wheat. Longitudinal data of this sort is not available for Ethiopia pre-food aid. Instead, we use indirect evidence based on trends in production, consumption and prices to examine the long-term consequences of food aid for Ethiopiaⁱ.

We then extend their analysis to the entire group of developing countries using a series of non-parametric regressions to identify trends in the production and consumption patterns of food aid recipients. We begin by exploring the relative importance of food aid by income level. We then explore the claim that food aid has turned countries that were once net food exporters into net importers. We study these trends separately for Sub-Saharan Africa (SSA) where poverty has increased over the past 30 years and where some of the largest recipients of food aid are. We conclude with a discussion of strategies for isolating the causal impact of food aid on outcome measures including poverty, food production (consumption) patterns and net exports.

Food Production and Consumption Patterns in Ethiopia

Ethiopia receives more food aid than almost any other country in the world. Food aid reached 15% of annual cereals production in 2003, and typically represents between 5 to 15 percent of total annual cereals production (Jayne, et al. 2002). At the same time, it is widely recognized that raising the productivity and profitability of smallholder agriculture is essential for poverty reduction in Ethiopia. Extensive government programs aimed at raising agricultural productivity have been disappointing. Many observers have attributed the poor performance of agriculture to uncoordinated food aid shipments (See for example Harrison 2002 and GebreMichael 2004).

Figure 1 shows the evolution of wheat food aid to Ethiopia and domestic wheat production between 1970 and 2003. Notice that food aid did not play an important role in the Ethiopian economy until the famine of 1984. Most food aid programs began in the late 1950s, but according to the most comprehensive international trade data available (Feenstra et al. 2005), Ethiopia did not begin importing wheat until the early 1970s. Between 1984 and 2003, however, wheat food aid was on average equal to 68.4% of domestic wheat production, and in some years, *wheat food aid exceeded domestic wheat production*. Thus, the potential for wheat food aid to impact producer prices and domestic output is significant.

In figure 2, we evaluate the claim that wheat food aid to Ethiopia is partly responsible for the decline in wheat producer prices. Wheat producer prices peaked during the famine of 1984 at a little over \$400 per metric tonne. In 2003, the producer price of wheat was only \$100 per metric tonne. The dramatic decline in producer prices occurred immediately following the famine of 1984, and since that time, there has been a slow but steady decline in producer prices. However, there is no apparent relationship between food aid and producer prices; food aid has been volatile while producer prices have been steadily falling. While it is impossible to rule out the possibility that food aid is responsible for the decline in producer prices, the aggregate data in figure 2 do not provide much support for this hypothesis.

Figure 3 confirms the poor performance of the wheat sector in Ethiopia: domestic production per capita was lower in 2003 than in 1970. The remarkable fact that stands out in figure 3 is the absence of correlation between wheat food aid and wheat production in

Ethiopia. Wheat production has remained relatively flat while wheat food aid fluctuates widely ranging from a low of near zero in 1970 to twenty kilos per capita in 1992. The result is that food aid has had a significant destabilizing affect on the availability of wheat in Ethiopia. This uncertainty about food aid deliveries may depress investment in domestic wheat production. We find no evidence however that wheat production as a share of total cereals production is on the decline in Ethiopia; it has remained relatively constant over the past twenty years ranging between 14% and 16%.

Figure 4 confirms that food aid deliveries to Ethiopia are primarily driven by fluctuations in the U.S. price of wheat. Between 1984 and 2003, the simple correlation between wheat food aid and the U.S. price of wheat is $-.761$. The starkness of this picture reveals that food aid is primarily driven by domestic political considerations in donor countries and not by a concern for poverty alleviation in Ethiopia.

The evidence presented in this section suggests the significant potential for wheat food aid to affect producer prices and incentives to invest in wheat. The volatility of food aid to Ethiopia, driven by variation in U.S. wheat prices, created uncertainty about supply conditions that might have deterred investment in the wheat sector. Although wheat food aid to Ethiopia is unlikely to have been a significant driver of the downward trend in Ethiopian producer prices, Ethiopia is as dependant on food aid today as it was in 1984. Hence, we cannot claim that food aid has had a significant beneficial long-term impact on the Ethiopian economy.

Food Production and Consumption Patterns in Developing Countries

We begin with an investigation of the relationship between income per capita (measured in constant 1985 dollars at purchasing power parity (PPP) exchange rates and collected from the Penn World Tables version 6.1) and the average percent of cereals consumption from food aid. This exercise will help us to determine the relative importance of food aid for the poorest countries in our sample. We follow this with an investigation into the relationship between income per capita and the value of net food and net cereal exports as a share of gross domestic product (GDP), measured at current prices. This can be thought of as the fraction of current income earned from the sale of these products or spent to purchase these products. This exercise will help us to evaluate the claim that food aid creates dependency and is responsible for turning countries that were once net exporters of food into net importers of food. We are particularly interested in comparing how cereals imports have evolved over time since the bulk of food aid comes in the form of cereals.

Using data from the Food and Agriculture Organization of the United Nations, (FAO), we calculate the annual value of cereals food aid as a as a percentage of cereals consumption for a sample of 99 developing countriesⁱⁱ and take the average value of this number for the period 1970-1979, 1980-1989, and 1990-2000.ⁱⁱⁱ We show the cross-sectional income profile for these three time periods in figure 5 by using a locally-weighted regression of decadal average cereal export share on the decadal average of the log of income per capita (bandwidth = 0.8). Figure 6 shows the results of performing the same analysis on the sample of Sub-Saharan African countries. We run the same

regressions for net food export share and net cereal export share and present those results in figures 7-10.

Figure 5 indicates that among developing countries, it has typically been the middle-income countries that rely most heavily on food aid. The cross-sectional relationship between the percentage of cereals consumption coming from food aid and income has changed over time. Between the 1970s and the 1990s, the average percent of cereals consumption from food aid increased at all levels of income. This increased reliance on food aid was most pronounced for the richest countries in the sample. During the 1970s, food aid cereals consumption of a developing country with an average income of \$8,103 averaged only around 3 percent, while during the 1990s, it averaged almost 8 percent. Figure 6 illustrates for SSA the cross-sectional relationship between income and the percent of cereals consumption from food aid switched from a hump to a U-shape leaving the middle income SSA countries where they started. The implication is that both the poorest and the richest countries in SSA have become more dependent on food aid over time.

Figure 7 indicates that among developing countries, only middle-income countries earn income from food exports. The cross-sectional relationship between food export earnings share and income appears to be flattening over time. In the 1970s, a country with a per capita income of \$1,100 is predicted to have positive net food exports. A country with this level of income in the 1980s or 1990s is predicted to be a net food importer. The trend in this data appears to be towards zero net earnings from food

exports. Though not shown here, this impression is even stronger when the sample size is enlarged to include 21 high-income OECD member countries.

In figure 8, we limit the sample to SSA. During the 1970s, only the poorest African countries were net food importers – countries like Nigeria, Uganda and Togo were net food exporters. This is no longer true. Comparing the dotted line to the solid line, we can see that the poorest countries switched from being net food exporters to net food importers. Taken together, the results in figures 7 and 8 do not allow us to rule out the possibility that food aid caused some countries, especially in SSA, to become net food importers. Since the majority of food aid comes in the form of wheat, we turn now to an analysis of net wheat exports.

Figure 9 shows that, in each decade, the poorest countries spent the largest fraction of their incomes on cereal imports. In fact, so few developing countries were net cereal exporters in any decade that the predicted net cereal export share was negative even at the highest income levels observed in the data.^{iv} Figure 10 shows that countries in Sub-Saharan Africa were net importers of cereals during the 1970s. The regression lines across decades look so similar that it is fair to say that in terms of cereals, not much has changed in SSA.

Except during the 1980s, wheat food aid has gone disproportionately to middle and upper middle income developing countries, calling into question the notion that food aid is primarily used to combat hunger in the poorest countries. This is in spite of the fact that the poorest developing countries spend disproportionately more of their income on cereals imports. The majority of the poorest countries in our sample that were net food

exporters during the 1970s are now food importers. Based on the evidence though, it seems unlikely that food aid is responsible for this reversal. The majority of food aid comes in the form of cereals and the poorest countries were net importers of cereals in the 1970s and still spend roughly the same proportion of their income on cereals imports. Nevertheless, the trend is disturbing particularly since it is largely driven by SSA where agricultural productivity is falling (Masters 2005), and farmers are losing jobs as a result of imported food.^v

Conclusions

Food aid is unreliable and has not delivered long term developmental benefits to the poorest countries^{vi}. Poor countries pay proportionately more of their income for cereals imports and receive proportionately less in cereals food aid than middle income developing countries. These patterns have remained relatively constant over time. At the same time, developing countries that were once net food exporters are now net food importers: this trend is most pronounced for countries in SSA. However, it is difficult to tie developing countries' increased dependence on food imports directly to food aid. Food aid comes primarily in the form of cereals and developing countries' net cereals exports have hardly changed over the last 30 years.

One possibility that we have not explored in this article is that by helping to preserve the status quo, food aid has inadvertently contributed to the decline in agricultural productivity in SSA. Governments that know they can rely on food aid in times of crisis may be less apt to spend scarce resources investing in agricultural research and development.

To identify food aid's impact on production and welfare, future work must exploit the variation in food aid due to domestic concerns in donor countries and unrelated to conditions in recipient countries. As in the case of Ethiopia, U.S. food aid donations are more closely related to U.S. wheat prices than to the food supply in Ethiopia. Although food aid is becoming more focused on humanitarian concerns, the historical record contains ample evidence of ulterior motives for food aid donations. Using motives centered on domestic donor concerns rather than recipient countries, one can avoid the spurious negative correlation due to famine-induced food aid and identify the causal effect food aid has on recipient countries.

An alternative explanation for SSAs increased reliance on food imports is trade liberalization. As tariff barriers are removed, imported food becomes less expensive. This problem is exacerbated by SSA's relatively low agricultural productivity. Whatever the reason, it is clear that African countries are becoming more and more reliant on food imports. This would not necessarily be a problem if these countries were exporting lots of manufactured goods or non-food agricultural exports; however, this is not the case.

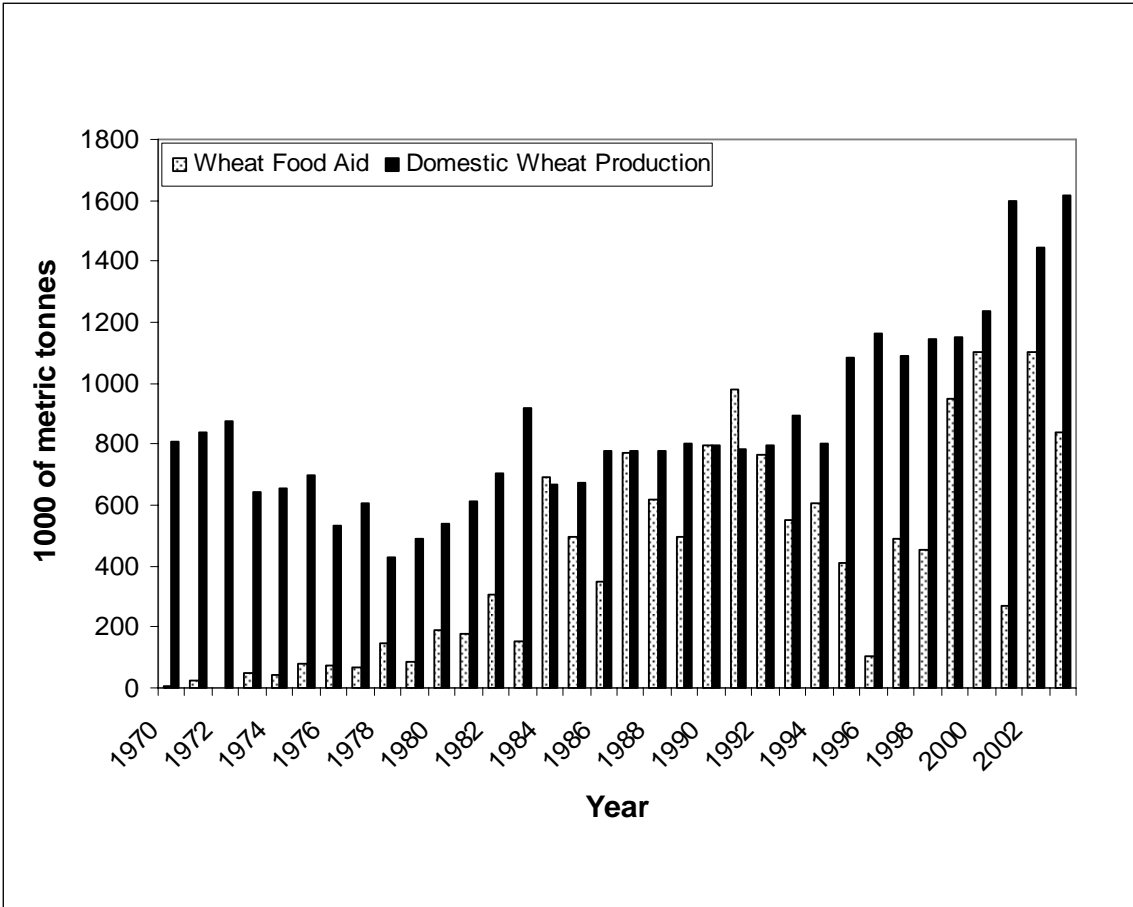


Figure 1. Ethiopia: wheat food aid and production

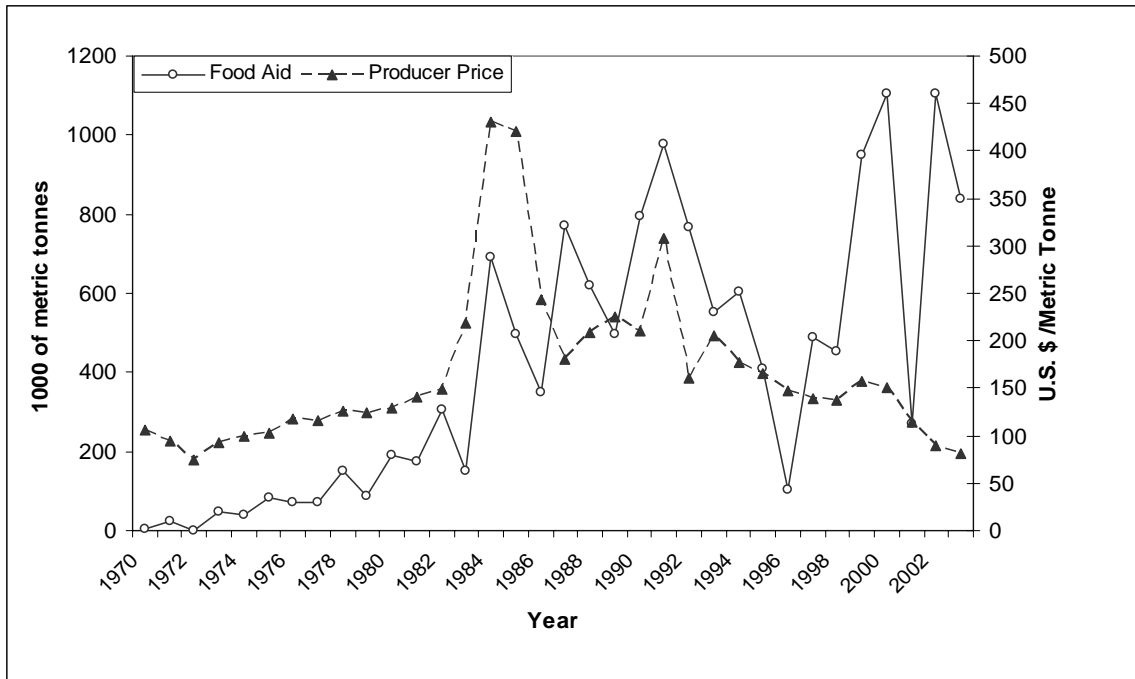


Figure 2. Ethiopia: wheat food aid and producer prices

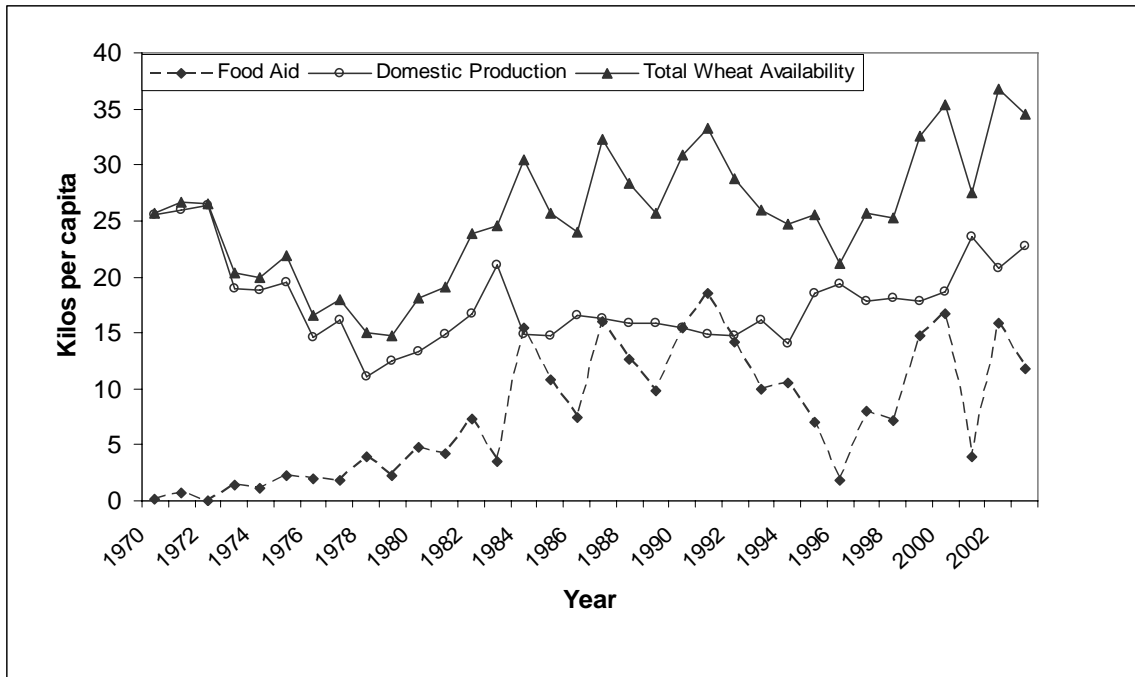


Figure 3. Ethiopia: wheat production and food aid per capita

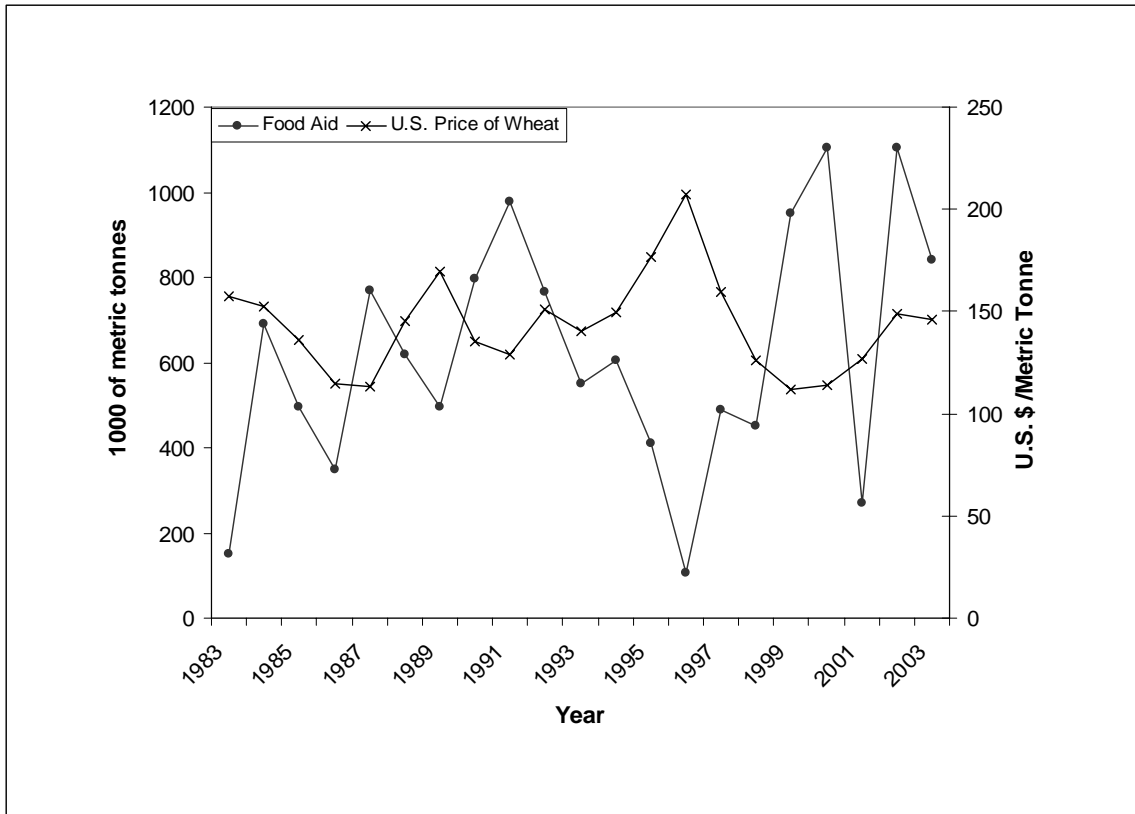


Figure 4. Ethiopia: wheat food aid and the U.S. price of wheat

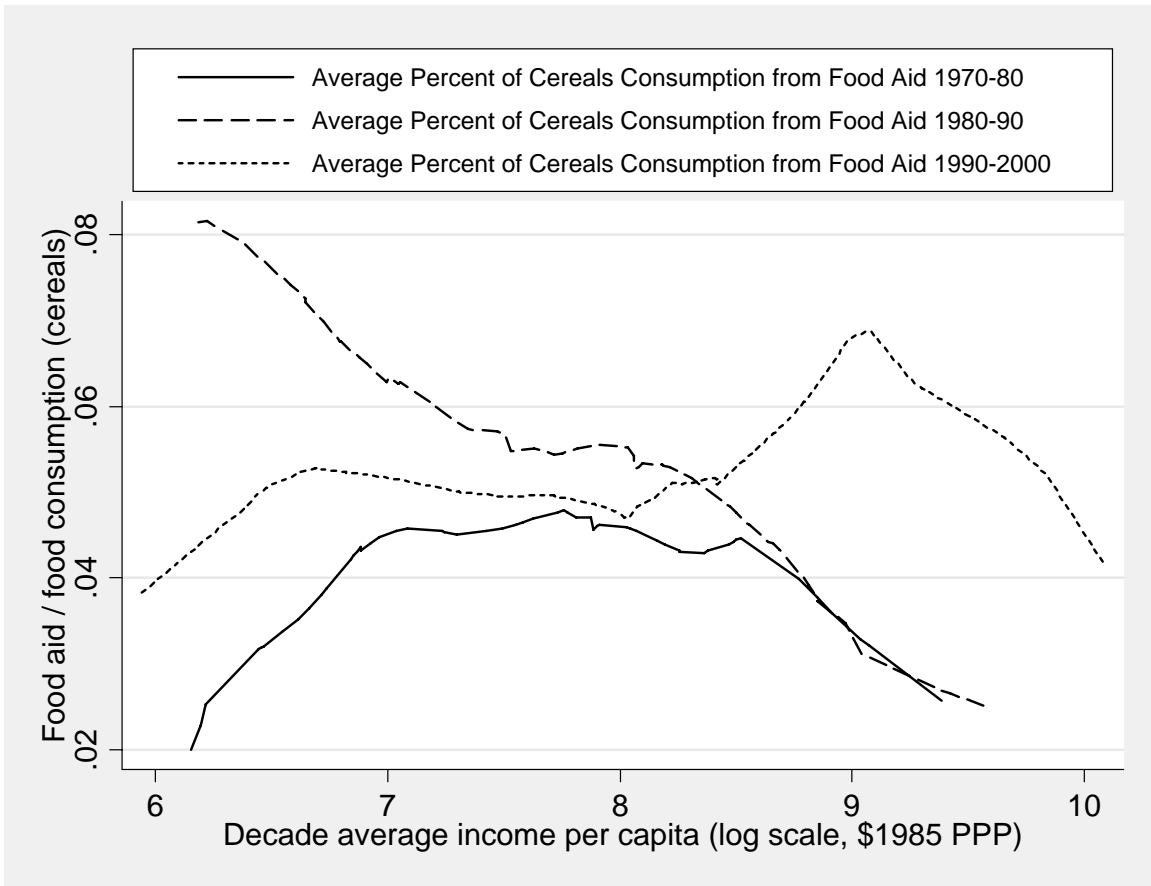


Figure 5. Developing countries: average income and cereals food aid by decade

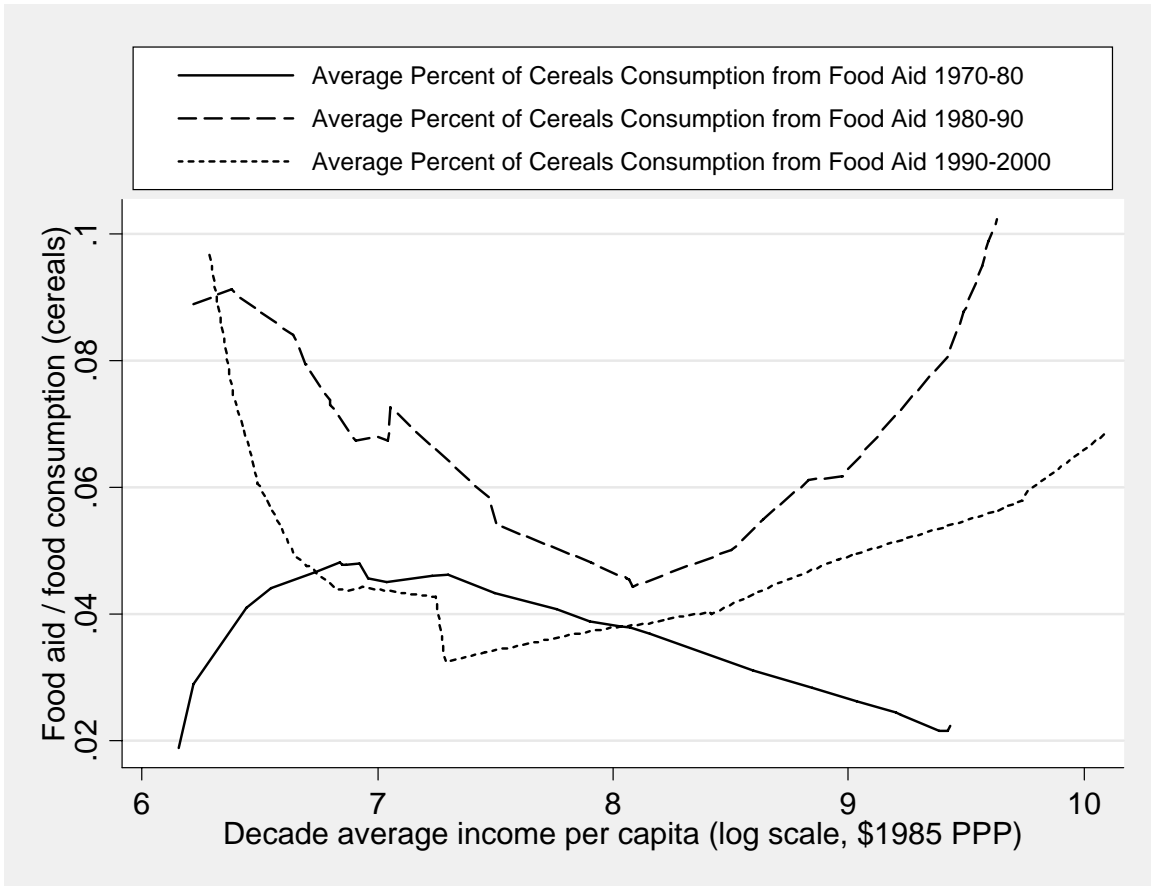


Figure 6. Sub-Saharan Africa: average income and cereals food aid by decade

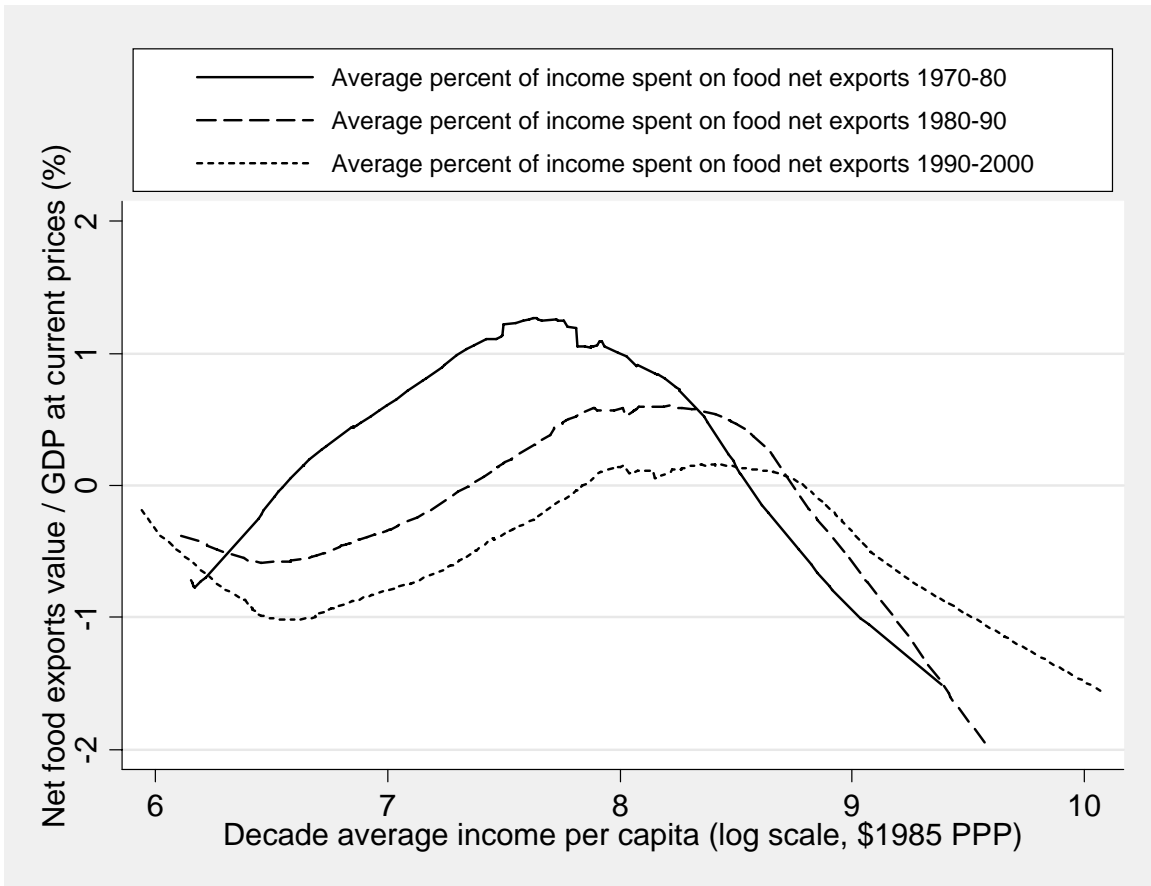


Figure 7. Developing countries: average income and net food exports by decade

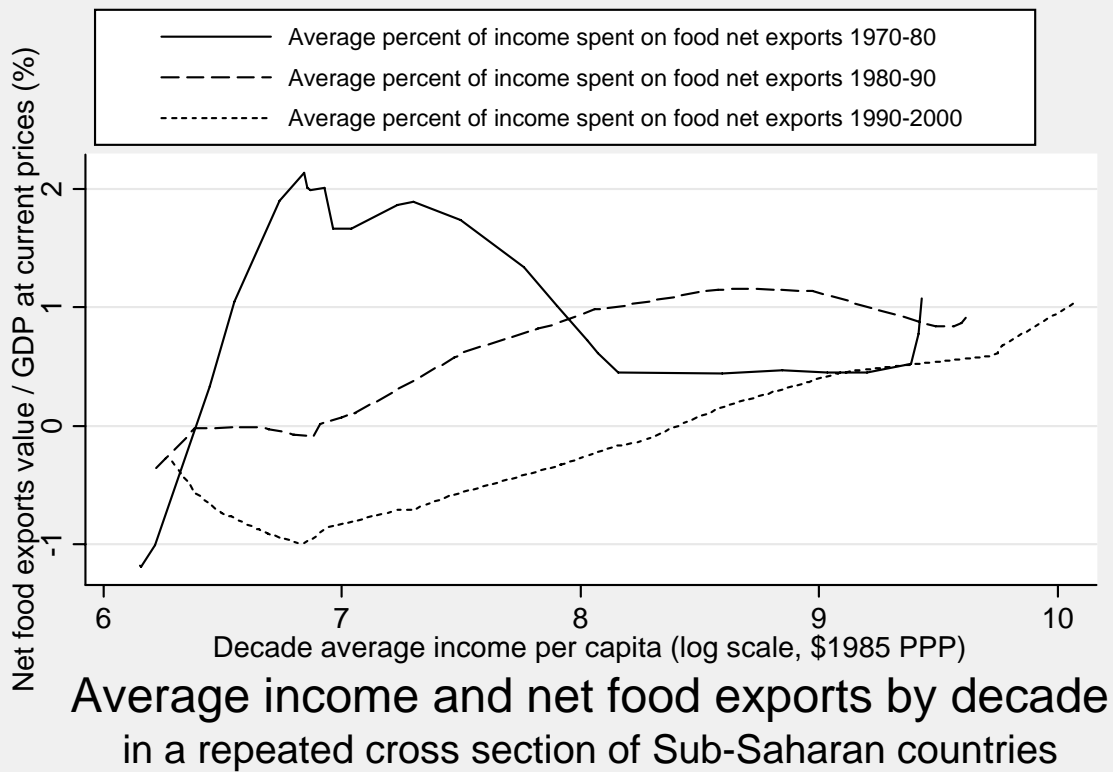


Figure 8. Sub-Saharan Africa: average income and net food exports by decade

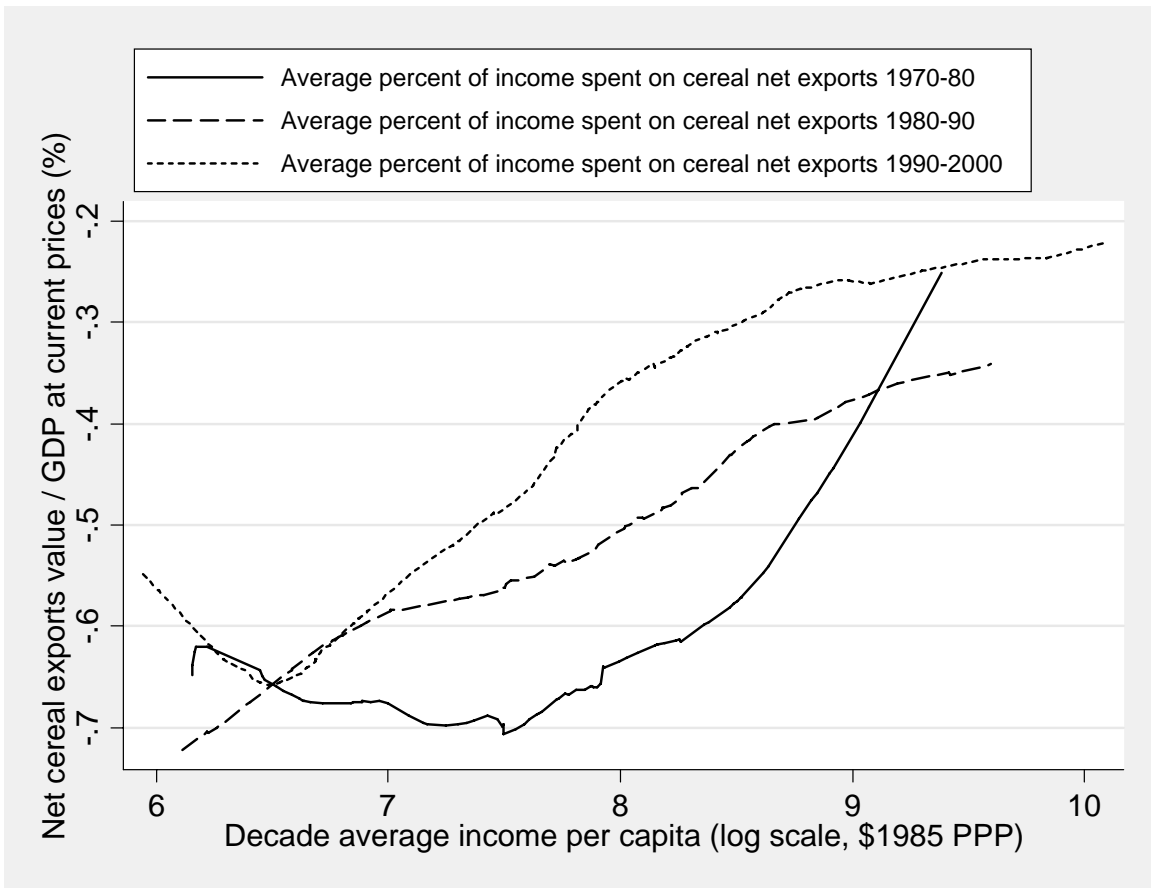


Figure 9. Developing countries: average income and net cereal exports by decade

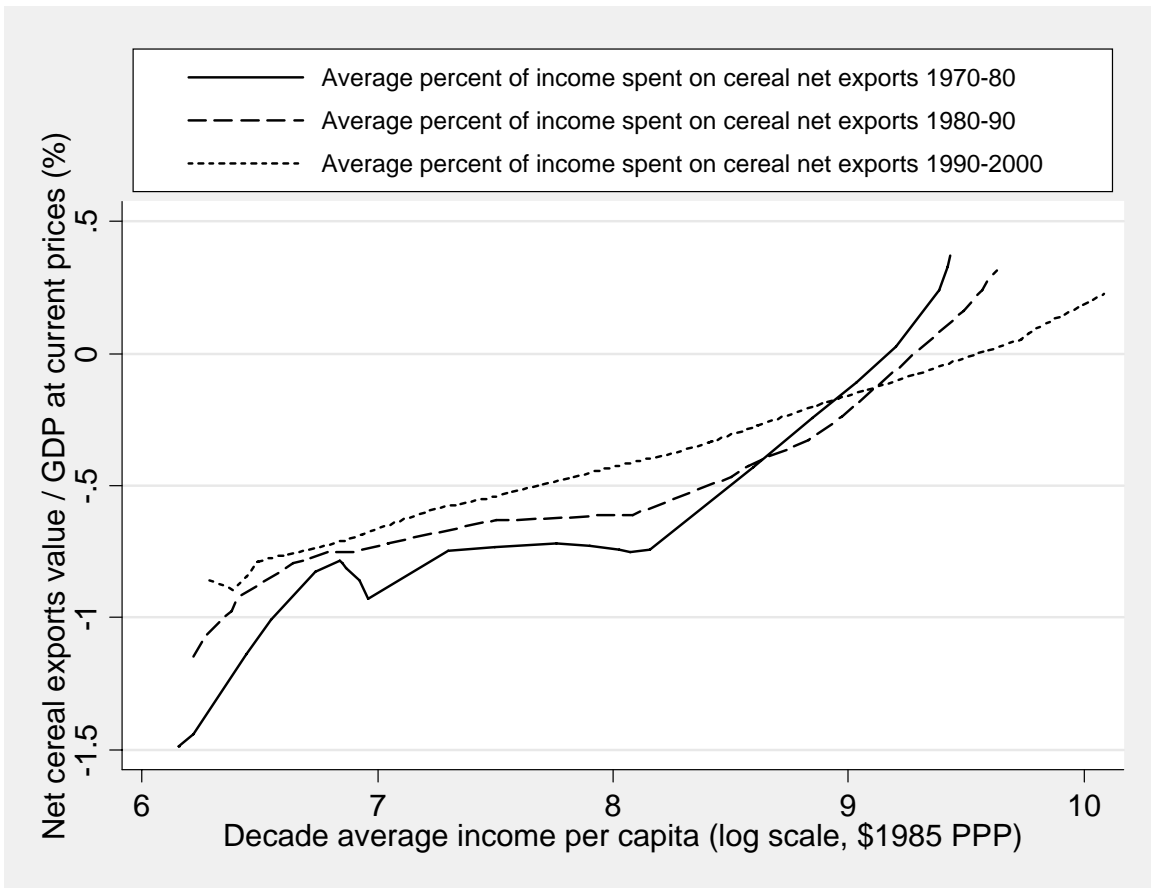


Figure 10. Sub-Saharan Africa: average income and net cereal exports by decade

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ⁱ An alternative approach employed in a recent paper by Gilligan and Hoddinott (2007) employs matching techniques to construct the counterfactual. The authors do the best they can with the data they have, but theirs is a relatively small sample over a relatively short time horizon and so it would be unwise to use their results to generalize about the long term consequences of food aid.

ⁱⁱ The sample includes three transition economies: Poland, Romania, and Hungary.

ⁱⁱⁱ The FAO definition of cereals include wheat, paddy rice, barley, maize, pop corn, rye, oats, millet, sorghum, buckwheat, quinoa, fonio, triticale, canary seed, and mixed grains.

^{iv} Among countries for which data are available, Thailand, Argentina, Nepal, Zimbabwe, South Africa, Uruguay, Pakistan, Kenya and Guyana had positive average net export earnings from cereals in the 1970s. This list expanded to include Vietnam, in the 1980s, but lost Nepal and Kenya. In the 1990s, Guyana, Argentina, Thailand, Vietnam, Hungary, Paraguay, India, and Pakistan had positive net export earnings from cereals.

^v “Africa today is more threatened by the possibility of losing jobs to imported foods than it has ever witnessed in its history.” (Mustapha, 2007)

^{vi} Researchers have tried to uncover the dynamic relationship between food aid and poverty with limited success. For example, Abdulai, Barrett and Hoddinott (2005) examine the relationship between food aid and food production in Sub-Saharan Africa and find that food aid stimulates domestic food production. The problem with this analysis is that because the authors focus on *changes* in food aid and *changes* in food production they uncover short-term cyclical variations around a trend. It is precisely the trends, however, that we need to understand. In addition, for identification, the authors focus on the effects of shocks to changes in food aid that are unrelated to contemporaneous changes in food production. While this is always possible to do econometrically, the economic nature of these shocks is not clear.