Distributional effects of maize self-sufficiency in Zimbabwe

Implications for pricing and trade policy

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Maize self-sufficiency has normally been an explicit policy goal throughout Eastern and Southern Africa because of the perception that it could be achieved at prices below import parity and that it contributes to rural income growth. However, this analysis, based on household survey data from Zimbabwe and the results of an econometrically based simulation model, indicates that a pricing policy geared towards maize self-sufficiency would mainly benefit a small set of well-off farmers and require either greater subsidies or higher prices to consumers, many of whom are low-income rural farmers in low-rainfall areas. The broader implications of this analysis are that, even if the producer price needed for self-sufficiency is below import parity, the pursuit of food self-sufficiency may inflate food costs and exacerbate rural and urban food insecurity compared to a self-reliance policy involving imports.

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The pursuit of food self-sufficiency as an explicit policy objective has normally been criticized by economists as an unnecessarily costly way of meeting national food needs. In countries where the costs of domestic food production and marketing exceed the landed cost of imports, food self-sufficiency involves either implicit taxation of consumers or an accumulation of government budget deficits, and a theoretical loss of social welfare.

However, there is a second category of countries, often landlocked and facing high international marketing costs, in which the expected producer price needed for self-sufficiency is normally below import parity and above export parity levels. In this case, border prices do not necessarily provide clear reference points on which to base domestic pricing decisions. This situation characterizes many countries of Southern Africa. Self-sufficiency in white maize, the staple food of most countries in the region, has normally been an explicit policy goal on the grounds that the world market for white maize is thin and that the producer price needed for self-sufficiency can normally be achieved at price levels below import parity. Moreover, a pricing policy geared towards maize self-sufficiency has been widely perceived to promote broad-based rural income growth and food security, because the vast majority of rural smallholders throughout the region devote more land to maize production than any other crop.[1]

Recent survey research, however, has begun to call into question the link between food price incentives and broad-based rural income growth. In Zimbabwe, a country that has exported maize in 20 of the past 22 years, a large portion of rural farmers are in fact net buyers of maize during a normal year.[2] A relatively small number of well-equipped farmers account for the majority of maize sold to the Grain Marketing Board (GMB). An extremely skewed distribution of marketed food output across rural households has also been uncovered in Malawi, Zambia, Tanzania and South Africa.[3]

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the comments of J. Shaffer, K. Muir and W. Masters on an earlier draft.

[1]Malcolm J Blackie, 'Maize, food self-sufficiency and policy in East and Southern Africa', *Food Policy*, Vol 15, No 5, October 1990, pp 383–394.
[2]Jayne Stock and Charles Chopak, 'Household income patterns in Zimbabwe's communal areas: empirical evidence from five survey areas', in T.S. Jayne, J.B. Wyckoff and M. Rukuni, eds, *Integrating Food, Nutrition and Agricultural Policy in Zimbabwe*, UZ/MSU Food Security Research Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare, 1990; B. Hedden-Dunkhorst, 'The role of small grains in semi-arid smallholder farming systems in Zimbabwe: preliminary findings', draft, SADCC/Icrisat, Matapos, Zimbabwe, 1990; T.S. Jayne and M. Chisvo, 'Unravelling Zimbabwe's food insecurity paradox', *Food Policy*, Vol 16, No 4, August 1991, pp 319–329.
[3]See, for example, P.F. Kandoole and L. Msukwa, 'Household food and income security under market liberalization: experience from Malawi', in J.B. Wyckoff and Mandi Rukuni, eds. *Food Security Research in Southern Africa: Policy Implications*, Proceedings of the Seventh Annual Conference of Food Security Research in Southern Africa, University of Zimbabwe/ Michigan State University Food Security Research in Southern Africa Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare, 1992; L. Malambo, *Rural Food Security in Zambia*, Report 29, Justus-Liebig University of Giessen, Hamburg, Germany, 1988; H.K.R Amani and W.E. Maro, 'Policies to promote an effective private trading system in farm products and farm inputs in Tanzania', in Wyckyoff and Rukuni, *ibid*; and J. Van Zyl and G.K. Coetzee, 'Food security and structural adjustment: empirical evidence on the food price dilemma in Southern Africa', *Development Southern Africa*, Vol 7, No 1, 1990, pp 105–116.
[4]U. Koester, *Regional Cooperation to Improve Food Security in Southern and Eastern African Countries*, Research Report 53, International Food Policy Research Institute, Washington, DC, 1986.
[5]In Zimbabwe, Kenya, Zambia, Malawi and South Africa, government influence over maize prices and supplies has been achieved through some or all of the following: (1) prohibiting private maize movement outside of district or zonal boundaries, (2) providing selective access to grain once in the hands of the state marketing board; (3) setting a narrow margin between the producer and selling price of the marketing board, such that private trading opportunities are rendered unprofitable in many areas and the state marketing board becomes the sole maize buyer

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The purpose of this article is to reassess the effects of maize self-sufficiency pricing on income distribution, household food security and the government treasury in Zimbabwe. An econometric simulation model is developed to measure the average maize procurement costs associated with the pursuit of maize self-sufficiency compared to alternative maize price levels/trade volumes, under a range of weather outcomes. Results indicate that, relative to a pricing policy oriented towards moderate imports, maize self-sufficiency pricing would benefit a small number of relatively wealthy farmers and require either greater government subsidies or higher prices to consumers. Many of these consumers are in fact rural farmers that comprise the lowest income strata in the country. A major implication of this analysis for other countries in the region is that – even if the expected producer price needed for self-sufficiency is below the cif import price – the pursuit of food self-sufficiency may inflate average food costs and exacerbate food insecurity compared to a self-reliance policy involving imports.

Balancing agricultural growth and food security

Maize policy analysis in Zimbabwe must start from the country's specific conditions. First, the major staple crop, white maize, is thinly traded on world markets. Second, Zimbabwean food production is highly unstable, primarily due to variable weather. Third, Zimbabwe's landlocked location exaggerates the fluctuations in domestic prices during years of surpluses and deficits. Food production in Zimbabwe and its Southern African neighbours is positively correlated.[4] Reliance on regional trade is limited, *inter alia*, because shortfalls in one country tend to coincide with shortfalls in neighbouring countries. It is clear that these structural features – extreme weather variations and positively correlated changes in production throughout the Southern Africa region – would produce large fluctuations in the absence of inter-annual supply stabilization.

The social and economic disruptions caused by instability in maize supplies and prices have given rise to the country's historical commitment to maize self-sufficiency. To achieve self-sufficiency, the Zimbabwean and former Southern Rhodesian governments have chosen to exert control over prices.[5] Unlike many food parastatals in Africa, the GMB consistently captures almost all of the marketed maize surplus. Zimbabwe's highly regulated marketing system explains the virtual absence of parallel grain markets, and the difficulty in dismantling state intervention in food markets without a viable private sector to fill the void. While such policies have imposed heavy costs on their grain sectors, textbook free market prescriptions have been ignored because they normally failed to satisfy policy makers' concern with the instability issue.

Yet even within the context of Zimbabwe's controlled market environment it may be possible for the government to achieve greater consistency between its maize pricing policy and its food security and income distributional objectives. As indicated by survey results across Africa, the distribution of land and assets is extremely skewed in rural Zimbabwe, causing very concentrated benefits from maize producer price incentives (Table 1). Within the smallholder sector, 1% of the farms (located mainly in the Mashonaland maize belt provinces) have accounted for 44% of the income from GMB maize purchases over the

Table 1. Concentration of income from maize sales to GMB (1985/86–1991/92 marketing years).

	Total number (approx) (A)	Number of farmers that sell maize to GMB (B)	GMB maize purchases (annual average) Tons (C)	Tons per family that sells maize (D)	Tons per all families within category (E)	% of total GMB expenditures on maize purchases accruing (F)
Commercial farms	4 000	1652[a]	490 902	297.2	122.7	46
Smallholder households:						
top 1% of maize sellers	9 000	9 000	254 182	28.2	28.2	24
next 9% of maize sellers	81 000	81 000	275 556	3.4	3.4	26
remaining households	810 000	24 000	47 948	2.0	0.06	4
All farms	904 000	115 652	1 068 588	9.3	1.18	100

[a]Based on 1985/86–1990/91 marketing years.
Row D = C/B; Row E = C/A; Row F = C/total GMB maize purchases.
Sources: Estimates of commercial and smallholder farm households in Row A are from Central Statistics Office, *Main Demographic Features of the Population of Zimbabwe*, Government Printer, Harare, 1985. Rows B and C are from Grain Marketing Board, Government of Zimbabwe, *Report and Accounts*, Grain Marketing Board, Harare, various years.

1986/87–1991/92 marketing years. The top 10% of farms have accounted for 92% of the income from GMB maize purchases. Nationally, 1% of all farms in Zimbabwe (ie about 1600 large-scale commercial farmers plus about 9000 smallholder farmers) have accounted for 70% of the GMB's outlay on maize purchases over the 1986/87–1991/92 period.[6] Household survey findings also indicate that about 40% of rural farmers are normally maize buyers.[7] In the drier and generally poorer areas, where most smallholders reside, the proportion of net grain buyers can be 70% or more even in a normal rainfall year, with about half of these households purchasing over 50% of their annual grain requirements.[8] Most of these households are grain purchasers not because they are devoting substantial resources to other crops, but because of binding resource constraints: limited land, draught animals and non-farm income to finance investments in technology, poor soil and low rainfall.[9]

Two major conclusions may be drawn from these findings. First, GMB maize pricing policy has extremely concentrated benefits on the supply side. Most rural smallholders derive little or no direct benefit from higher maize prices.[10] Second, many farm households are directly hurt by higher maize prices because they are maize purchasers. Given the skewed concentration of assets among the rural sector, it is questionable whether the government's objective of promoting broad-based rural income is compatible with a high-priced maize policy.

This point should not be construed as an argument for altering the rural–urban terms of trade. To the contrary, results elsewhere indicate that in countries characterized by a large gap between import and export parity there may be a close link between the prices of 'wage good' staple foods and the production costs of industrial exportables, through the labour market.[11] Because of important backward and forward linkages, the price of maize undoubtedly influences the general level of prices in the economy.[12] Therefore efforts to reduce the cost of procuring national food requirements could help increase disposable income in urban and grain-deficit rural areas and also promote competitiveness in other sectors of the economy.[13]

Over the long run, the most important benefits to producers and consumers of agricultural products may be achieved through processes that reduce production and marketing costs: rehabilitation of agricultural research institutions, input delivery systems, technical innovation

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by default; and (4) mandating a state monopoly on cross-broder trade, which is effectively enforced by point (3).

[6]Based on analysis of GMB data on national maize purchases, reported in more detail in T.S. Jayne, *Maize Pricing and Market Reform in Zimbabwe*, International Development Paper 15, Michigan State University, East Lansing, MI, 1993.

[7]Stack and Chopak, *op cit*, Ref 2.

[8]Heddon-Dunkhorst, *op cit*, Ref 2; Jayne and Chisvo, *op cit*, Ref 2.

[9]J. Govereh, 'Constraints to increased crop productivity in two low rainfall areas of Zimbabwe', unpublished MPhil thesis, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare, 1993.

[10]Although higher maize prices could, other things equal, contribute to the incomes of low-income smallholders by stimulating the demand for agricultural wage labour on larger farms, household survey data indicate that wage labour income is marginal for most smallholder families (Stack and Chopak, *op cit*, Ref 2).

[11]C. Delgado, 'Why domestic food prices matter to growth strategy in semi-open West African agriculture', *Journal of African Economies*, Vol 1, No 3, November 1992, pp 446–471.

[12]Malcolm J. Blackie, 'The elusive peasant: Zimbabwean agricultural policy', in M. Rukuni and C. Eicher, eds, *Food Security for Southern Africa*, UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare, 1987.

[13]Delgado, *op cit*, Ref 11.

and market reform. Cost reduction would in turn promote production incentives without the need for higher prices. Unfortunately, many of these cost-reducing investments have payoffs mainly in the long run. In the short-run time frame taken in this paper, the government's options to simultaneously protect low-income consumers and maintain adequate production incentives are limited; hence the examination of pricing and trade policies that could affect incomes and food security in the short run.

Food self-sufficiency *v* self-reliance: a conceptual model

Food self-sufficiency involves meeting domestic demand through production and stockholding. Food self-reliance involves meeting a country's requirements through a combination of production, stocks and trade, with the mix depending on the relative costs of procurement from each source.

A fundamental issue guiding the management of a national food economy is identifying the least costly way to secure national food requirements.[14] The conventional wisdom in Zimbabwe is that national food needs can normally be met at lower cost through self-sufficiency than through a strategy that involves imports. Available supply response models indicate that, under most weather outcomes, the average producer price required to achieve self-sufficiency is below the range of import parity prices over the past decade.[15] Powerful interest groups, in particular the farm lobbies, argue that a departure from the objectives of food self-sufficiency would thus represent an agricultural policy failure, since the cost of maize imports is higher than the price necessary to achieve self-sufficiency.

However, this situation would not necessarily justify an explicit policy of maize self-sufficiency. When the government can effectively control prices and trade, the average cost of securing national maize requirements may be lower using a combination of domestic production and imports (food self-reliance) than sole reliance on domestic production. This is clarified in Figure 1. Assume that Q_{ss} is total maize requirements given a specified consumer price, and that a producer price of P_{ss} is necessary to generate this amount through domestic production. A lower producer price, P_i, would generate domestic production, Q_i, that is below self-sufficiency. However, the country could pay P_i for this level of domestic production and pay the import price, PW, for residual import requirements (Q_{ss}–Q_i), resulting in an average procurement price, P^*, that is potentially less than the self-sufficiency price. This would be the case if $(P_iQ_i) + PW(Q_{ss}–Q_i)$ were less than $P_{ss}Q_{ss}$, or equivalently, if shaded area B were less than area A. The answer to this depends on the price elasticity of supply and the difference between the world price and self-sufficiency price. The lower the price elasticity of supply, other factors equal, the higher the costs of self-sufficiency compared to a self-reliance strategy. The greater the difference between PW and P_{ss}, other factors equal, the greater the opportunity cost of failing to achieve self-sufficiency.

Method

A simple econometrically based simulation model was used to estimate the costs and trade-offs associated with self-sufficiency maize pricing

[14]M. Rukuni and C. Eicher, 'The food security equation in Southern Africa', in Coralie Bryant, ed, *Poverty, Policy and Food Security in Southern Africa*, Lynne Rienner, Boulder, CO, 1987, pp 135–157.
[15]Steven Buccola and Crispen Sukumi, 'Optimal grain pricing and storage policy in controlled agricultural economies: application to Zimbabwe', *World Development*, Vol 16, No 3, March 1988, pp 361–371; Grain Marketing Board, Government of Zimbabwe, *Grain Pricing for 1992/93 Marketing Year*, GMB, Harare, 1992.

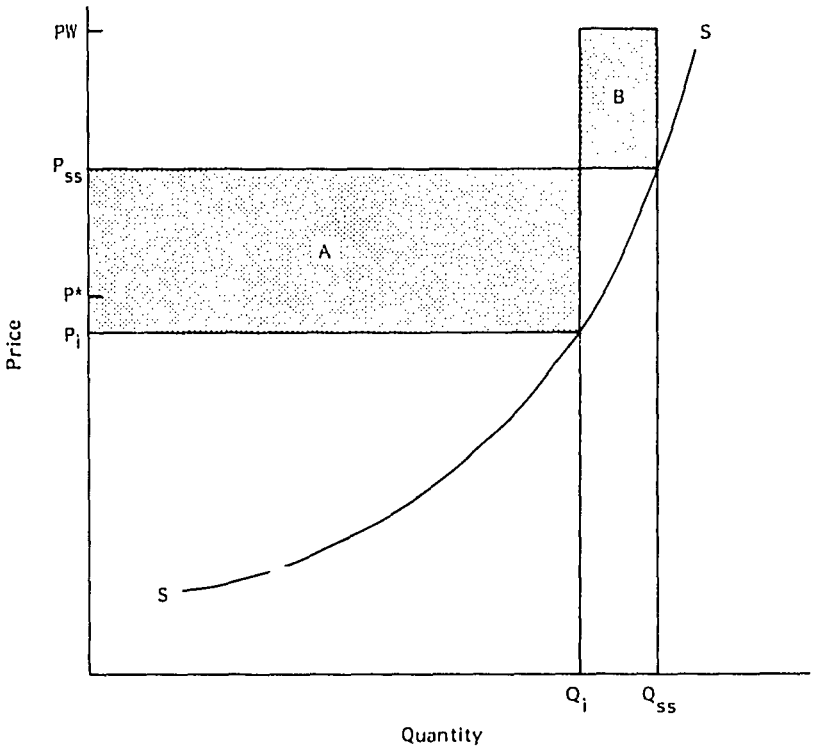

Figure 1. The costs of procuring national maize requirements under monopsony procurement: a heuristic model.

versus a self-reliance strategy involving various price and import combinations. Using data from 1978–91, the following method was used: Area equations for maize were specified separately for Zimbabwe's smallholder and commercial sectors.[16] The regression results were then used to estimate expected maize area at alternative producer price levels, holding other predetermined variables at their 1991/92 levels. Expected maize production was calculated for each price level under three weather scenarios: average yield and one standard deviation below (above) average yields. Next, GMB intake equations were specified for the smallholder and commercial sectors.[17] At the beginning of the marketing year the harvest and price announcements have already occurred and are hence exogenous. Next, national maize requirements (GMB domestic sales plus desired net stock accumulation) are calculated as a function of the three alternative weather scenarios.[18] After subtracting national requirements from expected supply, expected net import requirements were calculated for each producer price level, given alternative weather scenarios.

The analysis does not attempt to determine the optimal size of maize stocks, which is a function of how government weighs certain objectives against each other, such as price stabilization, cost minimization and import minimization.[19] The approach taken here is to consider the GMB's weather-adjusted estimates of official maize requirements – including stocks – as given, and then to determine the costs and distributional effects of procuring this quantity from a blend of domestic production and trade. The average procurement cost is either the domestic producer price plus marketing costs (if total maize requirements were obtained from local production), the cif import price plus marketing costs (if total maize requirements were obtained from world markets), or some blend price between the two if requirements were met through a combination of domestic production and imports. This

[16]Area equations are generally preferred to production or sales equations because they better reflect producers' response to price incentives and are less affected by weather, pests and other random disturbances: Hossein Askari and John Cummings, 'Estimating agricultural supply response with the Nerlove model: a survey', *International Economic Review*, Vol 18, No 2, 1977. Since prices are not known at the time of planting, price expectation equations were formed on the basis of stock levels and past prices. Full model specification and regression results are presented in T.S. Jayne and M. Rukuni, 'Trade-offs between food self-sufficiency and affordability: implications for maize pricing in Zimbabwe', report in Agricultural Economics Analysis, Center for Regional Development Research, Justus-Liebig University of Giessen, Germany, 1993.

[17]This relationship between maize production and marketed surplus was found to be non-linear for the smallholder sector; as production rises, a higher proportion of it is marketed. Assuming mean yield and price levels, and all other predetermined variables set at their 1991/92 levels, the estimated price elasticity of maize supply was 0.93 for the smallholder sector and 1.03 for the commercial sector.

[18]Requirements are sensitive to weather. In years where production is about one standard deviation below average, national requirements rise by about 35% due to higher sales of GMB maize to rural consumers. When production is about one standard deviation above the mean, direct

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analysis allows one to calculate the net revenue saved by pursuing a self-reliance strategy (ie domestic production and imports) at various producer price levels compared to a self-sufficiency strategy. In Figure 1 this corresponds to the net revenue saved from choosing price P_i and importing quantity $Q_{ss}-Q_i$ at the import price PW, rather than procuring total requirements at the expected self-sufficiency price; equivalently, shaded area A minus B.[20]

The information in Table 1 also underscores why we do not apply standard economic efficiency criteria to this analysis. The skewed distribution of income in Zimbabwe is the main impetus behind the Government of Zimbabwe's commitment to land redistribution. In such a situation, normative evaluations of alternative policies based on efficiency criteria such as the aggregation of producer and consumer surplus may not be useful for decision makers, since the government's stated objectives clearly reflect the interests of asset-poor smallholders (many of whom are net maize purchasers) more than the small group that derives the bulk of the producer surplus from maize sales. Moreover, as in all countries of the world, mechanisms of redistributing income in Zimbabwe are limited and costly. In such cases efficiency and distributional outcomes are not separable, and the evaluation of alternative policies cannot be based on Pareto criteria under the assumption that redistribution can take place to account for other government objectives. In light of this, alternative levels of maize prices and net imports are evaluated according to their effects on specific groups and objectives, without attempting to aggregate them into a normative measure of social welfare.

Probable effects of a least-cost procurement policy

Simulation results indicate that the producer price expected to achieve maize self-sufficiency is Z$845/ton. This price would yield an average procurement cost of Z$1020/ton including marketing costs. By contrast, the domestic producer price that minimizes the cost of procuring national maize requirements is Z$630/mt (US$105/mt at the 1992 shadow exchange rate). This price would require an estimated 385 000 tons of maize imports and would result in an average procurement cost (P^* in Figure 1) of Z$950/mt. Thus a least-cost procurement policy would be expected to cost 6.9% less than a self-sufficiency policy for the same amount of maize, under normal weather. The producer price–procurement cost curve is somewhat flat near the cost-minimizing price level, ie there is little difference in the average procurement cost for producer prices between the ranges of Z$550/ton and Z$700/ton. This is because lower prices and expenditures on domestic procurement are counterbalanced by larger import bills. Beyond a producer price of about Z$700/ton, however, the average cost of procuring national maize requirements rises sharply. Under the drought and high-yield scenarios, the expected cost-minimizing producer price would reduce the average cost of procuring national maize requirements by 1.3% and 16.1%, respectively, relative to the expected self-sufficiency price. Under all yield scenarios within one standard deviation of the mean, the government is thus capable of acquiring its maize requirements at lower cost through a strategy involving domestic production and imports rather than a self-sufficiency strategy. Assuming that these savings were passed on to consumers in the form of lower maize meal prices, so that the

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and indirect sales to rural consumers decline, causing a 20% decline in national GMB sales. The analysis assumes that the price elasticity of demand is zero.

[19]Thomas C. Pinckney, *Storage, Trade, and Price Policy under Production Instability: Maize in Kenya*, Research Report 71, International Food Policy Research Institute, Washington, DC, 1988.

[20]We used a high-end cif price of Z$1230/mt (US$204/mt at the 1992 shadow exchange rate) in this calculation. Actual GMB import prices in 1992 and early 1993 were about 10–15% lower. This will result in a conservative estimate of the net cost savings from a strategy involving imports.

government incurred neither a loss nor a surplus on its maize trading account, maize meal prices would decline by 7%.[21]

Information presented in Table 1 indicates that the decline in GMB payments to maize farmers would be distributed over a very narrow range of well-equipped farmers. The decline in net income would be moderated, however, after accounting for substitution effects in production. Most smallholder farmers, particularly those in the drier portions of the country, would experience little or no loss in income from a maize price decline; in fact, many would directly benefit from the lower acquisition prices.

Policy efforts to pass lower maize procurement costs along to farmers in grain-deficit areas may also induce dynamic changes in cropping patterns consistent with regional comparative advantage. Several farm-level analyses have concluded that cotton, groundnut and sunflower normally provide higher financial returns than grain crops in the semi-arid smallholder areas,[22] yet these calculations are made on the basis of producer prices. For food-deficit smallholders, however, the opportunity cost of cash crop production is not the net return to growing and selling food grains, but rather the cost of acquiring the grain forgone by cultivating cash crops, which is related to the acquisition price of maize rather than the producer price. Recent research results indicate that for grain-deficit farmers the incentive to devote resources to cash crop production is negatively related to the consumer price of maize meal.[23] Policy efforts to promote broad-based rural income growth through crop diversification appear to be linked to efforts to reduce the cost of food in grain-deficit rural areas.

Consumer preferences also figure prominently in an appropriate maize pricing policy. White maize is the preferred type of maize for human consumption throughout Southern Africa, yet world trade in white maize is very thin. There is thus the risk that in times of shortage the world market cannot produce the volume of white maize required by Southern African states. Yet Zimbabwe may reduce the uncertainty of acquiring maize from the world market by forward contracting with exporters for a given volume each year. If these supplies are not needed in any particular year, the GMB can simply forgo the premium involved before taking possession of the maize. The costs and risks of relying on the world market would also fall substantially if yellow maize were acceptable to consumers. The experience of the 1992 drought revealed that consumers' acceptance of yellow maize was considerably greater than previously thought. Rapid appraisal surveys conducted in late 1992 indicate that *sadza* (the staple dish) made with yellow maize may actually be preferred over white maize by up to 25% of the population.[24] Since yellow maize is abundantly traded and normally 20% cheaper on world markets than white maize, efforts to allow consumer preferences to determine demand and price levels relative to white maize would reduce the risks and costs of a self-reliance policy, and also promote self-targeting. This contrasts markedly with typical government policy of restricting consumers' access to yellow maize except during droughts.[25]

Policy lessons for Eastern and Southern Africa

The experience of Zimbabawe underscores a broader policy message that, even if the expected producer price needed for self-sufficiency is

[21]To gauge the robustness of these findings, we repeated this analysis using the GMB's own econometric model linking the level of producer price to expected maize production (GMB, *op cit*, Ref 15). The expected self-sufficiency price, according to this model, is Z$904. This is very close to the Z$900/mt price that the Government of Zimbabwe actually announced for maize in June 1992. Following the same procedure as before, the GMB's model suggests that the domestic producer price that minimizes total procurement costs is about Z$610/mt. This price would reduce total procurement costs by an estimated 10.1% under normal weather, 2.8% under a drought, and 24.2% under the high-yield scenario, relative to the announced price of Z$900/mt.

[22]Ministry of Lands, Agriculture and Rural Resettlement, *The First Annual Report of Farm Management Data for Communal Area Farm Units*, Ministry of Lands, Agriculture and Rural Resettlement, Government of Zimbabwe, Harare, 1990; World Bank, *Zimbabwe Agricultural Sector Memorandum*, Vol II: *Main Report*, World Bank, Washington, DC, 1991.

[23]T.S. Jayne, 'Do underdeveloped grain markets constrain cash crop production?', *Economic Development and Cultural Change*, October 1993, forthcoming.

[24]Lawrence Rubey and W. Zambe, 'Targeted food assistance and the potential role of yellow maize: exploring production, processing and consumer demand linkages', report to USAID/Zimbabwe, Harare, 1992.

[25]Substitution effects on the consumption side would probably be minor. Wheat is the major consumer substitute for maize, is normally imported, and is more expensive on world markets than maize. One might expect that a decline in the price of maize would reduce wheat consumption and hence the food import bill. In actuality, wheat is rationed at artificially low controlled prices, and shortages are common. Thus increased maize consumption would probably not appreciably affect the effective demand for wheat and would thus have little welfare impact associated with substitution in consumption.

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below the cif cost of imports, there may be an important trade-off between food self-sufficiency and food affordability. Without broader-based gains in productivity or a reduction in marketing costs, the stimulation of food production growth in high-potential areas through price incentives will erode purchasing power and food security in grain-deficit rural areas as well as urban areas. This situation has manifested itself in Zimbabwe in the recent past in the form of high rural malnutrition amidst national food surpluses. Results of this analysis suggest that a least-cost procurement policy would be expected to cost 6.9% less than a self-sufficiency policy for the same amount of maize, under normal weather. If the government passed on these cost savings to the retail level, consumers would pay an estimated 7% less for maize meal given the distribution of weather outcomes. While this type of pricing policy would adversely affect static economic efficiency, it would confer broad-based gains to a large proportion of rural smallholders as well as urban consumers. The reduction in maize prices made possible by such a strategy may in turn induce dynamic changes in cropping patterns that provide higher levels of agricultural growth and welfare over the long run.

The potential for food pricing and marketing policy to concurrently promote food availability and affordability depends on a cognizance that (a) the pursuit of maize self-sufficiency through high maize prices does not necessarily contribute to broad-based rural income growth; (b) reliance on moderate levels of maize imports does not necessarily constitute an agricultural policy failure; and (c) practical difficulties in redistribution mean that static Pareto efficiency criteria cannot necessarily form the sole basis for pricing policy in the presence of other social objectives.

The trade-offs between domestic production incentives and food affordability may be relieved by measures to reduce food production and marketing costs and increase incomes. Over the long run, this requires sustained support for input and credit delivery systems, agricultural research and extension to generate and disseminate new technology, efficient product distribution and processing systems, and income-generating activities. But all of these will be critically affected by price policy and its dynamic effects on the distribution of income and subsequent patterns of demand. The skewed distribution of assets and productive potential among the rural population in many African countries underscores the need for a clearer understanding of the determinants of broad-based rural income growth and implications for food pricing and trade policies.