IRIS Reprint

The Center for Institutional Reform and the Informal Sector (IRIS) has two main purposes expanding knowledge about institutions in economic development through research, and assisting reform efforts in the third world and in countries undergoing transitions to a market economy The premise of the IRIS Center is that in unsuccessful economies the existing rules establish poor incentives, often forcing economic activity into the informal economy, and that appropriate reforms improve economic performance IRIS is especially concerned with the legal and policy framework needed for democratic societies with competitive markets

IRIS
2105 Morrill Hall
College Park, MD 20742
(301) 405-3110

CENTER FOR INSTITUTIONAL REFORM AND THE INFORMAL SECTOR

University of Maryland at College Park

Center Office IRIS Center, 2105 Morrill Hall, College Park, MD 20742
Telephone (301) 405-3110 • Fax (301) 405-3020
E-mail Info@iris econ umd edu
World Wide Web http //www inform umd edu/IRIS

The Political Economy of Food Pricing An Extended Empirical Test of The Interest Group Approach

Thierry Van Bastelaer
IRIS Reprint No 82
July 1998

This publication was made possible through support provided by the U S Agency for International Development, under Cooperative Agreement No DHR-0015-A-00-0031-00 to the Center on Institutional Reform and the Informal Sector (IRIS) and administered by the Office of Economic and Institutional Reform, Center for Economic Growth, Bureau for Global Programs, Field Support and Research
The views and analyses in the paper do not necessarily reflect the official position of the IRIS Center or the U S A I D

Author Thierry van Bastelaer, IRIS Center,Department of Economics, University of Maryland, College Park

Reprinted from *Public Choice* 96 pp 43-60, 1998

Public Choice **96** 43–60 1998

The political economy of food pricing An extended empirical test of the interest group approach

THIERRY VAN BASTELAER*
Center for Institutional Reform and the Informal Sector (IRIS) Department of Economics University of Maryland College Park MD 20742 U S A

Accepted 23 January 1996

Abstract Several recent studies have documented the magnitude and impact of distortions in food pricing However little attention has been paid to the nature of the political agendas that determine the levels of direct and indirect protection granted to producers and consumers This paper offers evidence that regardless of the degree of economic development the level of political pressure wielded by interest groups in food markets and hence the level of protection they receive is an inverse function of the relative size of their constituencies The results recommend the application of collective action concepts to the understanding of agricultural policies in countries which are at different stages of development

Siasa ni kilima (Politics is agriculture)
Tanzanian proverb

There is indeed no such thing as an apolitical food problem
Amartya Sen

1 Introduction

The proposition that industrialized countries implicitly subsidize their agricultural producers while less developed ones discriminate against them has gained widespread acceptance by agricultural economists and political scientists [1] Several recent studies have documented the magnitude of these distortionary practices and their impact on food prices and production [2] Few research projects, however have addressed the political forces that shape

* The author wishes to express his gratitude to John Adams Christopher Clague Peter Coughlin Bruce Gardner Mancur Olson Anand Swamy and an anonymous referee for their comments He is also grateful to the IRIS Center for its support of this work This publication was made possible through support provided by the U S Agency for International Development under Cooperative Agreement No DHR 0015A-00 0031 00 to the Center on Institutional Reform and the Informal Sector (IRIS) and administered by the Office of Economic and Institutional Reform Center for Economic Growth Bureau for Global Programs Field Support and Research All shortcomings of this paper are the sole responsibility of the author

the price level of food commodities across countries This paper suggests and tests the following hypothesis the price of food items is determined by political agendas at the national level rather than by climatic conditions or variations in global food markets and the content of these political agendas is the direct result of the conflictual interaction of producer and consumer lobbies The suggestion that new research is needed to challenge the conclusions of traditional models of voting behavior and price setting is supported by the following paradox although agricultural producers in industrialized countries represent a small proportion of the labor force, their political influence is such that they receive prices for their products which on average lie well above international prices Farmers in developing countries on the other hand, constitute the majority of the labor force, yet they rarely have the upper hand in the struggle for influence over the public policies that affect their returns As a result they face agricultural prices that are low relative to the international standards By relying on newly available figures and on some of the latest econometric developments in the handling of panel data this paper provides evidence that the dynamics of interest group competition offer an essential clue to the understanding of the political forces that shape this paradox

The paper opens with a brief depiction of the magnitude of the distortions in food prices After the presentation of a conceptual framework that applies collective action concepts to food pricing policies the paper discusses the results of an empirical analysis that addresses simultaneously the time series and cross-sectional aspects of food pricing policies over a wide array of industrial and developing countries These results suggest that an interest group approach contributes significantly to the understanding of the political mechanisms that generate food pricing policies Holding equal all other factors (in particular the level of national development), the regression analysis shows that small interest groups are more influential than large lobbies in the design of food policies It also suggests a complementary result as food consumers become richer they are more willing to implicitly subsidize local farmers This last result adds to the understanding of the politics of food pricing but without affecting the significance of the collective action hypothesis the use of panel techniques reveals that both hypotheses contribute to the understanding of the political forces that shape food prices a result that was missing from earlier analyses due to their use of incorrect econometric specifications The paper concludes with a discussion of the implications for research suggested by the present results

2 Evidence and patterns of food pricing distortions

The literature on food prices suggests that the impact of country-specific political variables leads to distortions in the prices of food that are negative in most developing economies and positive in most industrial nations The levels of protection in a sample of 31 countries, as measured in nominal terms by the direct indirect and total protection rates, are presented in Table 1 The countries are classified by region, themselves listed in increasing order of average protection level (with Sub-Saharan Africa at the lower end and Japan and other food importers at the higher end) Direct protection rates vary between –26 9 percent in Ghana and 85 9 percent in Switzerland (i e , the average price paid to farmers in Ghana during the 1955–80 period was 26 9 percent lower than world prices, and 85 9 percent higher in Switzerland) Indirect protection is an important element of total protection in developing countries it dominates the rate of direct taxation in all regional averages [3]

Additional figures provided by Krueger, Schiff, and Valdes (1991) suggest that the positive protection of agricultural producers is more pervasive in more developed countries at any moment in time and that a similar pattern is observed in a large number of countries as their economies develop [4] Krueger Schiff and Valdes also point at the favorable treatment, in terms of relative prices that governments accord to import-competing over exportable commodities

3 Conceptual framework Collective action and food pricing policies

The theory of collective action and particularly the role of interest group size in the provision of public goods, offers a framework which is flexible enough to be applied to the operation of food pricing policies in countries which exhibit wide variations in their political, economic and social systems This section presents the central role that the concept of group size plays in the outcome of interest group competition and shows how it can be applied to the dynamic of price setting in food markets, resulting in the observation that under a set of restrictive assumptions relatively small associations can yield more political influence than large lobbies [5]

Public goods exhibit two properties which account for most of the difficulties inherent in collective action the non- exclusion and the non-rivalry of consumption Private goods display neither of these properties, while pure' public goods exhibit both [6] "Impure" public goods are characterized by imperfect non-exclusion and/or imperfect non-rivalry

Table 1 Nominal rates of agricultural protection sample countries sorted by protection level (percent)

Country	Period	NPRi	NPRd	NPRt
Cote d Ivoire	1960–82	–23 3	–25 7	–49 0
Ghana	1958–76	–32 6	–26 9	–59 5
Zambia	1966–84	–29 9	–16 4	–46 3
AVERAGE	1960–84	–28 6	–23 0	–51 6
Argentina	1960–84	–21 3	–17 8	–39 1
Colombia	1960–83	–25 2	–4 8	–30 0
Dominican Republic	1966–85	–21 3	–18 6	–39 9
Egypt	1964–84	–19 6	–24 8	–44 4
Morocco	1963–84	–17 4	–15 0	–32 4
Pakistan	1960–86	–33 1	–6 4	–39 5
Philippines	1960–86	–23 3	–4 1	–27 4
Sri Lanka	1960–85	–31 1	–9 0	–40 1
Thailand	1962–84	–15 0	–25 1	–40 1
Turkey	1961–83	–37 1	5 3	–31 8
AVERAGE	1960–86	–24 2	–12 0	–36 4
Brazil	1969–83	–18 4	10 1	–8 3
Chile	1960–83	–20 4	–1 2	–21 6
Malaysia	1960–83	–8 2	–9 4	–17 6
AVERAGE	1960–83	–15 7	–0 2	–15 9
Korea	1960–84	–25 8	39 0	13 2
Portugal	1960–84	–1 3	9 0	7 7
AVERAGE	1960–84	–13 6	24 0	10 4
Australia	1955–80	n a	2 8	n a
Canada	1955–80	n a	2 5	n a
New Zealand	1955–80	n a	–1 0	n a
United States	1955–80	n a	4 5	n a
AVERAGE	1955–80	n a	2 2	n a
Denmark	1955–80	n a	12 3	n a
France	1955–80	n a	32 5	n a
Germany	1955–80	n a	45 2	n a
Italy	1955–80	n a	54 5	n a
Netherlands	1955–80	n a	28 3	n a
United Kingdom	1955–80	n a	27 5	n a
AVERAGE	1955–80	n a	33 4	n a
Japan	1955–80	n a	60 5	n a
Sweden	1955–80	n a	49 2	n a
Switzerland	1955–80	n a	85 9	n a
AVERAGE	1955–80	n a	65 1	n a

Source Krueger Schiff and Valdes (1991) Anderson and Hayami (1986)

The feature of public goods that is most relevant to the study of the pric ing of food is their non-excludable nature When a public good, such as the price of food products is non- excludable each member is unlikely to bear a fraction of the total cost of providing the good equal to his/her share of the total benefit from its consumption Under a Nash equilibrium situation mem bers will contribute to the provision of the good up to the point where their marginal benefit from the consumption of the last unit of the good equals the marginal cost of its provision, but spillin effects from other members' actions are not accounted for As a result, the amount of the public good provided at equilibrium is not Pareto-optimal for the group, and most members will enjoy the benefit of the good without fully contributing to its provision unless selective incentives"[7] are directed at non-contributors

While small groups may provide their members with a (still suboptimal) amount of the public good without resorting to selective incentives larger groups will not supply the same level of public good without extensive use of these incentives Indeed, the larger the number of individuals in the group the more serious the suboptimality will be, for four main reasons First the likelihood that individual contribution to the provision of the public good will be perceptible decreases with group size, and the incentive for individual action diminishes accordingly [8] Second, successful collective action requires a significant level of organization, communication, and coordination among members the transaction costs associated with these arrangements increase with group size, and inhibit the efficacy of collective action [9] Third deadweight losses created by price support programs are shared by the whole population, and interest groups will experience a proportion of the losses that decreases with their numerical size [10] Finally, the development and operation of selective incentives may present more difficulties in large groups than in small ones Olson's (1965 36) main conclusion that 'the larger the group the less it will further its common interest"[11] is the basis for the hypothesis tested in the present paper [12]

This theoretical outcome can be applied to the politics of food pricing in the following manner Assume that the economy comprises two homogeneous groups which engage in competition to increase the average utility of their constituents the urban coalition (which lobbies for lower food prices) and the farm group (which tries to secure high price for its members' output) The size of the labor force is fixed and if, as assumed here, the government acts only as a redistributive agent, its budget is unaffected by its pricing policy [13] As a result of this assumption, the objective functions of the two groups are clearly antagonistic, since higher food prices for farmers necessarily imply a lower collective utility for the urban coalition, and vice-versa

The government's objective is to maximize the aggregate support it receives from the farm and the non-farm groups An increase (decrease) in the agricultural protection rate creates larger (smaller) political support from farm interest groups and higher (lower) opposition from the urban coalition The government grants protection to the most influential group, in the form of positive or negative markups in food prices The level of protection granted to farmers is a positive function of the farm lobby's efficiency in pressuring the government for higher food prices, and a negative function of the urban coalition's efficiency in lobbying for lower prices The level of protection under a Nash equilibrium is reached when the marginal political benefit of additional support from the farmers is equal to the marginal cost of lost support from the urban coalition

In its original formulation (Olson, 1965), the theory of collective action does not specifically define group size in absolute or relative terms the distinction is conceptually useful only when addressing competition among groups Indeed according to Olson's hypothesis, an increase in the absolute size of a single group is a sufficient condition for the decreased efficiency of its collective action However when two or more groups are competing for the same good or service their comparative efficiency is a decreasing function of their relative, rather than absolute, size As an example suppose the farm lobby and the urban coalition in a small country are competing for price protection by the government Assume there are one million members in the farm lobby and three million in the urban coalition Disregarding for a moment the assumption that the total population is fixed, suppose that a large number of immigrants from a neighboring country, say one million people joins the urban coalition The political influence of the farmers (and therefore the level of protection they receive) is likely to increase as a result of the migration (even though the size of the farm group is unchanged) because the urban coalition includes more members there are still one million farmers after the immigration, but their share in the total population has decreased from 25 to 20 percent Therefore, in a conflictual framework, the absolute number of members in a coalition is a weaker indicator of the coalition s relative efficiency at organizing for collective action than its relative size, expressed as a proportion of the labor force [14] With a fixed-size labor force, the same logic applies, but is reinforced by the fact that a larger urban group necessarily means a smaller rural constituency [15]

The econometric analysis, presented in the next pages therefore tests the hypothesis that, all other things being equal, a small agricultural sector will benefit from higher price protection than a large farm group, and that consumer groups will face lower food prices when their size decreases

4 A panel-data analysis of the determinants of food pricing distortions

The econometric analysis covers 31 countries on four continents [16] over the 1960–82 period [17] This section describes the collective action variable presented in the conceptual framework and introduces four control variables The sign in parentheses next to each variable indicates the sign that the regression is expected to produce for the corresponding regressor

4 1 *Description of the variables*

The *total nominal protection rate* is used as the dependent variable in the regression equation The values of the dependent variable are produced by the computation of the weighted averages of the nominal total protection rates of three major tradable crops corn, wheat and rice [18] The weights used for the calculation of the averages are the shares of each commodity in the total value of the yearly production of the three commodities, measured at producer prices The values of the indirect protection rate for the 13 industrial countries of the sample are set equal to zero, based on the assumption that the indirect protection rate captures the effects of industrial protection and exchange rate overvaluation, and that the magnitude of these policies has been negligible in the industrial countries of the sample, over the period under consideration

The collective action variable used as regressor is the *share of the agricultural sector in the total domestic labor force* (–)

The following four indicators are introduced in the regression equation as control variables The value of the *net normalized food exports*[19] (–) accounts for the hypothesis that countries which are net importers of food protect their agriculture while net exporters implicitly tax it Olson (1985) and Anderson (1986) suggest that the protection of farmers meets with less resistance if the country is a net importer of food, since assistance can be covertly provided through import controls Protecting farmers when the country is a net exporter requires direct subsidies which are more conspicuous (since they require budgetary approval) and therefore politically costlier The introduction of this variable allows us to examine whether trade status helps explain the observed levels of agricultural protection, as suggested by Krueger, Schiff and Valdes

A loss of comparative advantage in agriculture resulting from the transfer of resources to industry is expected to prompt higher demands for protection by farmer groups An index of *comparative advantage of agriculture versus industry* (–), developed by Honma and Hayami (1986), is accordingly introduced in the regression analysis A factor-endowment ratio is used as a proxy for the level of comparative advantage of agriculture

The *Gross Domestic Product per capita* (+) measured in 1985 international prices is used as a control variable to account for three potential effects First, as Engel s Law suggests, consumers spend a smaller proportion of a larger disposable income on food expenditures Consequently, they have less incentive to collect information about the implicit tax they transfer to the farmers and their opposition to higher food prices decreases Second the demand for food is relatively price-inelastic in wealthier countries, and any increase in productivity results in larger price declines than in poorer countries, and in intensified calls for protection by the farm lobbies Finally, as incomes increase, a prosperous countryside is increasingly regarded as a part of the national cultural heritage prompting contributions by consumers in the form of lower resistance to higher food prices

Finally, an *interaction term* (–) is included in the regressions to test an assumption of the conceptual framework the government s role in the political confrontation that results in food price protection is that of a mere arbitrator i e the government does not fiscally benefit from the protection it grants to the most influential interest group If this assumption is correct, the size of the government (measured by the share of government consumption in GDP) will not be correlated with the levels of agricultural protection But the fiscal instruments used by the government vary according to the food trade status of the country if the country is a net food importer satisfying higher fiscal needs requires the imposition of tariffs on imported food and thereby contributes to positive farmer protection If the country is a net food exporter however rent- seeking by the government will result in higher taxes on food exports and lower farmer protection The interaction term is specified as the product of the share of government consumption in GDP and the value of the country s net food exports

4 2 *Econometric specification*

The few existing empirical analyses of food pricing policies have used ordinary least squares (OLS) techniques to produce results that offer support to the model of interest group competition [20] There are, however, two main reasons to believe that OLS is not the correct specification for the analysis of food pricing distortions First, these earlier studies have refrained from including in their regression equations the two independent variables which are shown here to carry most of the explanatory power the size of farm interest groups and the level of development (approximated by the level of GDP per capita) These variables are highly correlated with each other [21] and their simultaneous inclusion in OLS regressions affects the significance levels of the coefficients to such an extent that no conclusion can be drawn about their relative empirical significance Second, it is very likely that sev-

eral unobserved or unquantifiable characteristics of the countries and years of the sample ignored by the OLS regression technique, influence the levels of agricultural protection These country-specific characteristics include among others the following

- the level of flexibility of the political process,
- the composition of electoral districts,
- the cultural and religious role of food and agriculture,
- the attitude of the urban public toward the countryside,
- the degree of the country's commitment to externally- imposed adjustment programs which require significant reductions in food subsidy programs
- the recent occurrence of rural-urban migration,
- the inequality in the distribution of arable land,
- the personal, regional or professional links of policy makers with the farming community
- the existence in developing countries of an ideology of development aimed at industrializing the economy by transferring resources from agriculture and
- other institutional arrangements which affect the distribution of power among farmers and consumers

In addition to the above country-specific factors, the present study also considers year-specific effects allows the analysis to account for factors that affect all countries agricultural sector during a given year This added level of precision is particularly important, since the time series used for the regression analysis (1960–82) include years of significant volatility in world energy and food prices

The remainder of the econometric analysis addresses the following question even though previous OLS results offer substantial endorsement of the role of collective action in explaining patterns of agricultural protection, does the conceptual framework presented in this paper retain any empirical validation once the unobservable country- and time-specific effects are taken into consideration?

The first step in answering this question is to establish whether the country and time effects contribute significantly to the analysis After including a dummy variable for each year and each country of the sample, the use of F-tests determines whether these variables, and the unobserved effects they represent belong in the regression equation The results of F-tests are reported in Table 2 They indicate that in all regression equations the inclusion of country effects and the addition of time effects to country effects, are econometrically justified both types of effects are statistically significant when

Table 2 Results of fixed effects and random effects regressions of the total protection rate 31 developing and industrial countries

	1	2	3	4	5	6	7
Intercept			79 0680	[1]		63 8672	
			(5 4499)			(4 8016)	
Share of farmers in total labor force	-2 1818	-2 1582*	-1 5861	-2 1090	-2 2309	-1 6056	
	(-4 7560)	(-4 7063)	(7 0857)	(-4 5890)	(-4 8744)	(-6 7227)	
Net normalized food exports	-6 1451		-25 9168	8717		-10 2747	6 4674
	(5208)		(2 1037)	(1475)		(-1 7615)	(5355)
Comparative advantage in agriculture	7 5718		-2 6426	7 7032		-2 7164	9 3550
	(1 4767)		(9745)	(1 5082)		(- 9313)	(1 7874)
GDP per capita	0163	0161		0163	0161		0180
	(10 2480)	(10 2099)		(10 2660)	(10 2661)		(11 3210)
Interaction term (net normalized food exports × government size)	49 9906		100 821		15 3420		55 4494
	(6913)		(1 3109)		(4259)		(7493)
Adjusted R^2	2632	2559	0988	2565	2627	0821	2251
F test (one way effects on countries vs OLS)	21 770	40 649	28 104	32 110	25 190	34 350	21 955
	(0000)	(0000)	(0000)	(0000)	(0000)	(0000)	(0000)
F test (two way effects on countries and years vs one way effects on countries)	28 040	52 452	31 386	41 313	33 219	38 628	26 411
	(0000)	(000)	(0000)	(0000)	(0000)	(0000)	(0000)
Hausman specification test (fixed (fixed vs random effects)	75 972	48 856	32 280	57 004	68 602	22 468	51 877
	(0000)	(0020)	(2219)	(0004)	(0000)	(6086)	(0027)

Note equations 1 2 4 5 and 7 estimated by fixed effects equations 3 and 6 estimated by random effects t values of coefficients in parentheses with level of significance shown as = (99%) = (95%) and = (90%) P values of specification tests in parentheses number of observations = 512

[1]The fixed effects technique does not compute an estimated value of the intercept since the observations it utilizes are constituted of the individual data minus the unit means Coefficients produced by the random effects technique are a weighted average of the fixed effects estimates and the between group coefficients which result from the regression of unit means on unit means Since the latter regression produces an intercept random effects techniques also produce an intercept

considered together and a correct specification of the model should include them

The next step is to determine whether to model the country and time effects as fixed or random In the former case, the fixed effects model' [22] is the appropriate estimation procedure in the latter, the effects are assumed to be drawn from a stochastic distribution, and the random effects"[23] specification should be used Mundlak (1978) suggests that all country and time effects be treated as random, and that this decision will produce biased estimates only if the unobservable effects are correlated with the independent variables used in the regression Such a relationship is highly likely to be present, however, a lack of correlation between observed and unobserved characteristics is more prone to be an exception than the rule In such cases, the regression analysis will yield biased results if the random effects specification is used while using fixed effects will produce estimators that are best linear unbiased [24] While the fixed effects specification is costly in terms of degrees of freedom lost [25] the literature on food pricing provides no a priori reason to assume that the country effects are uncorrelated with the regressors as is assumed in the random effects model The choice of the correct regression procedure will then rely on the outcome of the Hausman specification test [26] In regressions 1 2 4 5 and 7 of the total protection rate (see Table 2) the results of the Hausman tests reject the null of orthogonality between the country effects and the explanatory variables when gross domestic income is included in the regression analysis, fixed effects is therefore the proper specification for these regressions Regressions 3 and 6 include regressors that are uncorrelated with country- and year-specific effects, and for which the random effects technique represents the correct econometric specification

4 3 *Results of fixed and random effects regressions of the nominal total protection rates*

Table 2 reports the results of fixed and random effects regressions of the total protection rate over the sample of 31- country and 512 observations The theoretically pivotal variable of the collective action model the *share of farmers in the total domestic labor force*, enters with negative coefficients and levels of significance upward of 99% in all regressions On average a 10 percent decrease in the proportion of agricultural workers in the national labor force is observed along with a 4 59 percent increase in the total protection rate The significance of this result is especially robust since the econometric technique used is a two way fixed effects (on countries and years), the significance of the coefficient of the share of farmers suggests that the levels of protection reflect national policies that are designed by governments without consideration for time-specific external factors The wedge between border

and local prices is maintained even in periods of fluctuation in world prices food price stability appears to be a lesser concern for the governments than the need to address the demands of the interest group that wields the most political influence in food markets The role of the group size variable in the econometric analysis suggests that, in the area of food pricing, the sum of all individual costs inherent in collective action outweighs the voting power of large groups, as suggested in the conceptual framework [27]

The coefficients of the control variables suggest that accounting for the *comparative advantage of agriculture* does not contribute to the analysis All other factors being equal, it also does not appear that the value of *net food exports* is a feature in the determination of protection levels This result does not support Krueger, Schiff, and Valdes's (1991) observations about the preference of price- setting policy makers toward importable crops [28] The estimate for the *level of income per capita* is positive and strongly significant in all regressions in which it enters and its average elasticity with respect to the total protection rate is 65 All other things equal, richer countries appear to protect their agriculture more than poorer ones do However the precise attributes of high levels of disposable income that account for this result remain to be identified, reliable figures for the price and income elasticity of the demand for food will help to refine the analysis of the influence of income per capita on food policies

Finally the distortions of incentives which result from discretionary price decisions do not appear to be motivated by the satisfaction of fiscal needs the coefficient of the *interaction term* is insignificant in all regressions suggesting that larger governments (in terms of the share of their consumption in GDP) do not extract higher rents from food markets Certainly rent-seeking behavior can be a function of more than the mere size of the public sector as hypothesized here, in developing countries, the strive for rapid industrialization starting at the time of independence, created a powerful incentive for transferring resources out of the agricultural sector This element is indirectly captured in the fixed effects analysis discussed earlier in this section

The regression equations include combinations of two variables which are highly correlated with each other the share of farmers in the labor force and the GDP per capita As Table 2 indicates, the coefficients for share of farmers are negative and highly significant in all equations that contain the GDP per capita variable This result, absent from previous studies because of their incorrect econometric specification, suggests that, in addition to attributing the proper weight to unobservable time and country effects, the fixed effects specification also attenuates the effects of multicollinearity on the significance of the estimates

An additional step can be taken to determine the nature of the country-specific effects by examining the role of the *number of agricultural holdings per capita* (–) This variable distinguishes the role of landowners from that of hired agricultural laborers who are generally not actively involved in lobbying for higher food prices The main variable of the regression analysis presented in this paper, the share of the agricultural labor force in the domestic labor force, does not distinguish between landowners and landless workers However, it is likely that the degree of inequality in land distribution or concentration index, affects the success of collective action by rural interest groups Assume countries A and B have agricultural populations of equal size in both absolute and relative terms, in country A all agricultural workers own the land they cultivate, while in country B only 10 percent of the rural labor force is constituted of landowners All other things equal, the theory of collective action suggests that organization by landowner groups will face fewer obstacles in country B and that their members will enjoy higher price protection The variable used as a proxy for the distribution of land in this empirical test is the number of holdings per member of the agricultural labor force A higher number of holdings per capita would imply a more equal distribution of land, a dilution of political influence by rural groups and lower price protection In contrast to most country effects described earlier the concentration variable is quantifiable, but only a few values are available for the period under review The influence of this variable can nevertheless be accounted for by performing OLS analysis of the unobserved country-specific effects on the concentration variable (in average value), the effects are computed by the fixed and random effects analysis of the total protection rate The results of this procedure are presented in Table 3 In four of the seven regressions of the country effects the distinction based on rural land distribution produces estimates that are highly consistent with the predictions of the theory of collective action for a given absolute and relative number of rural inhabitants price protection decreases when land is more equally distributed since a constant level of political influence requires the organization and mobilization of a greater number of landowners This result is consistent with the observation of a large decrease in food prices in Egypt that followed the land reform initiated by Nasser in 1952 Further inquiries into the influence of land distribution on price protection will benefit from the collection, in panel format, of information on land tenure and sharecropping arrangements

The joint significance of the collective action and income per capita hypotheses is a major result of the research presented in this paper Leaving one of these hypotheses out of the regression equations results in a theoretical misspecification, but including both of them in OLS analyses (as was done

Table 3 Results of OLS regressions of the country specific effects on the number of agricultural holdings per capita 31 developing and industrial countries Effects generated by fixed and random effects regressions of the total protection rate

	1	2	3	4	5	6	7
Constant term	140 174	133 708	177 552	124 071	148 782	161 572	−26 2850
	(3 7207)	(3 7340)	(5 8508)	(3 2772)	(4 1667)	(5 3167)	(−1 0623)
Number of agricultural	−520 527	−520 723	−197 073	- 524 302	−511 107	−194 825	−180 306
holdings per capita	(−2 52392)	(−2 6108)	(−1 3429)	(−2 5042)	(−2 5909)	(−1 3048)	(1818)
Adjusted R^2	1188	1370	0119	1186	1322	0105	0434

Note t values of coefficients in parentheses with level of signific ince shown as = (99%) = (95%) and = (90%) number of observations = 31

in earlier studies) produces singularly large standard errors of the estimates due to multicollinearity The use of panel data techniques allows this paper to consider jointly the validity of both hypotheses By allowing the consideration of the longitudinal variation in the data, panel techniques show that the significance of each hypothesis is not an artifact of excluding the other one from the analysis The collective action and income per capita models are prominent features in the literature on food pricing their interaction is shown in this paper to be a major element of the political economy of food policies across continents [29]

5 Conclusion

The research conducted for this paper produced four major findings First and most importantly the theory of collective action appears to be a major component in exposing the political factors which account for the distortions in national levels of food prices The relative size of farm interest groups is negatively and significantly correlated with the price protection they receive from governments even when the level of overall economic development is taken into account This result casts doubt on the applicability of models of voting behavior to the dynamics of food pricing since the minority group be it constituted of food producers or consumers, distorts public policies to its advantage at the expense of the majority Second, the role of collective action variables is valid both over time and across a wide spectrum of countries The third notable result is that richer countries offer their farmers higher price protection than do poorer countries Finally, the paper suggests that in addition to their individual significance, the collective action and the income per capita hypotheses contribute jointly to the understanding of the politics of food pricing

Further research should contribute to a better understanding of distortions in food markets in the following areas Although the analysis performed for this paper highlights the pivotal role of interest group competition in the design of pricing policies, evidence and case studies of the extent functions and effects of collective action among rural groups are lacking Additional time and resources should also be devoted to the identification of the country-specific effects which account for an important part of food policies as well as the development of appropriate empirical instruments to capture these effects Such additional information will contribute to a better understanding of the political backdrop of price reforms, and to the design of policy recommendations which are precisely calibrated

Notes

1 Byerlee and Sain (1986) represent an exception by disputing the validity of this stylized fact

2 See among others Bale and Lutz (1979) Gulati and Sharma (1992) Knudsen Nash et al (1990) Krueger Schiff and Valdes (1991) Sah and Stiglitz (1987) and Schultz (1978)

3 Information on the nominal indirect protection rate is not available for industrial countries See Section 4 1 for the empirical consequences of this unavailability

4 Anderson (1986) suggests that all economies eventually reach a stage in their economic development where price protection of farmers shifts from negative to positive values

5 This section draws on Olson s (1985) and Peltzman s (1976) papers

6 In the context of the present study an example of an pure public good would be the benefits farmers receive from a price support program run by the government To the extent that the government guarantees all farmers a given price this price is by design non rival and non excludable on the producer side Note that if the government finances this price support program by levying taxes on a fixed number of non farmers this tax is a rival but non excludable public good for taxpayers since an increase in the number of taxpayers reduces the per capita fiscal burden The price support remains non rival and non excludable for the farmers

7 Such incentives are (positive or negative) reinforcements which reward members who bear their portion of the total cost of collective action and penalize members who fail to do so

8 This argument implicitly assumes group symmetry If tastes and endowments are asym metric however the likelihood of provision of the public good increases since the richest (or more interested) group members can provide the public good even if the poorest (or least interested) members do not contribute at all

9 Whether these costs increase at a higher or lower rate than group size is an important issue which is addressed in note 11

10 Deadweight costs of subsidization and taxation are the theoretical concepts which drive Becker s (1983) model of interest group competition Becker offers an interpretation of the effect of group size on political effectiveness that largely parallels the hypothesis pre sented here

11 Olson s conclusion has given rise to a number of critical developments Sandler (1992) and Chamberlin (1974) have pointed to the unspecific role that rivalry plays in Olson s theoretical construction Olson s analysis does not specify whether it is concerned with the provision of exclusive or inclusive goods Of particular interest in this respect is Chamberlin s (1974) paper Chamberlin s conclusions echo Olson s in the case of exclu sive goods the total quantity of the public good provided approaches zero as group size approaches infinity Chamberlin submits however that when the collective good is inclusive the amount provided of the good increases with group size and approaches a finite limit as the group size approaches infinity He justifies this result by the fact that the decrease in the contribution of each individual (also acknowledged by Olson) is more than offset by the increase in group size Chamberlin s analysis suggests that the relation ship between group size and provision of inclusive public goods might not be inverse it does not however fully establish that the only logical corollary of this result is a positive relationship between provision level and group size

12 Hirshleifer (1991) supports this hypothesis he submits that poorer or smaller actors are often at an advantage in power struggles because they are motivated to invest more in conflictual strategies than richer or larger opponents

13 This assumption is tested in the econometric analysis

14 This hypothesis is not inconsistent with the observation of the substantial political power expended by large interest groups such as the American Association of Retired Persons which operate in a framework that lacks the conflictual aspects addressed here Indeed the

lines that separate the AARP from citizen groups that oppose the Association s demands are blurred by a number of specific factors such as sympathy for older people the fact that most citizens have retired relatives or will eventually retire themselves As a result organized opposition to the goals of the AARP is difficult to assemble irrespective of the Association s size A similar argument can be made to explain the political influence of charitable groups

15 Anderson and Hayami (1992) and Lindert (1991) suggest that the function that relates political influence to relative group size is concave A forthcoming paper establishes that over a wide range of developed and developing countries the function does not exhibit a global inflection point

16 In the developing regions Argentina Brazil Chile Colombia Dominican Republic Egypt Morocco Cote d Ivoire Ghana Zambia South Korea Malaysia Pakistan Philippines Sri Lanka Thailand Turkey and Portugal In the industrial regions Canada United States Denmark France Germany Italy Netherlands United Kingdom Sweden Switzerland Japan Australia and New Zealand

17 The data used for the analysis is derived from a number of sources which are listed in an appendix available upon request

18 While this decision about the commodity coverage offers more consistency than an arbitrary and numerically unequal choice of commodities it is not without cost Given the wide heterogeneity of economic and agricultural structures included in the sample the three commodities account for different fractions of each country s agricultural production

19 The values of this variable are calculated using the following ratio

$$\frac{(\text{food exports} - \text{food imports})_t}{\text{food exports} + \text{food imports})_t}$$

20 These analyses can be found in Honma and Hayami (1986) Miller (1991) and Lindert (1991)

21 The simple correlation between the GDP per capita and the share of farmers in the labor force is equal to 849

22 This is also known as the least squares with dummy variable (LSDV) analysis of covariance (ANCOVA) or within units approach

23 The random effects estimator is a weighted average of the fixed effects estimate and the between groups estimator (the OLS estimate of the coefficients using country means)

24 The efficiency of the fixed effects technique is reduced if some independent variables are time invariant in this case the fixed effects analysis is not able to distinguish these variables from the dummy variables introduced to account for time and country effects The present analysis shows that two independent variables are affected by this problem

25 The method increases the number of regressors by including (i–1) country dummies and (t–1) year dummies

26 In this test the null hypothesis is that no correlation exists between the country and the regressors If the test produces large values of the chi squared statistic the null is rejected and fixed effects is assumed to be the correct specification

27 Chamberlin s (1974) claim that larger interest groups provide higher levels of inclusive public goods does not find support in the present results

28 Regressions of the direct protection rate documented in van Bastelaer (1995) also produce insignificant estimates of the net exports variable in variance with Krueger Schiff and Valdés s (1991) suggestion that net importing countries offer higher direct protection to their farmers than net exporters do

29 van Bastelaer (1995) documents the results of regressions of the direct and total protection rates over two subsets of the sample used for the present study The collective action model is shown to be less apt at explaining the politics of food pricing over a sample of 13 industrial nations than in a group of 18 developing countries Other variables which

impact the efficiency of collective action by interest groups such as the level of political and social instability and the development of communication and transportation networks do not significantly contribute to the depiction of the political background to food policies

References

Anderson K (1986) Economic growth structural change and the political economy of protection In K Anderson and Y Hayami (Eds) *The political economy of agricultural protection* 7–16 Sydney Allen and Unwin

Bale M D and Lutz E (1979) *Price distortions in agriculture and their effects* World Bank Staff Working Paper 359

Becker G (1983) A theory of competition among pressure groups for political influence *Quarterly Journal of Economics* 98(3) 371–400

Byerlee D and Sain G (1986) Food pricing policy in developing countries Bias against agriculture or for urban consumers? *American Journal of Agricultural Economics* 68(4) 961–969

Chamberlin J (1974) Provision of collective goods as a function of group size *American Political Science Review* 68(2) 707–716

Gulati A and Sharma A N (1992) Subsidising agriculture A cross country view *Economic and Political Weekly* 27(39) 106–116

Hirshleifer J (1991) The paradox of power *Economics and Politics* 3(3) 177–200

Honma M and Hayami Y (1986) The determinants of agricultural protection levels An econometric analysis In K Anderson and Y Hayami (Eds) *The political economy of agricultural protection* 39–49 Sydney Allen and Unwin

Knudsen O and Nash J (1990) *Redefining the role of government in agriculture for the 1990s* World Bank Discussion Paper No 105

Krueger A Schiff M and Valdes A (1991) *The political economy of agricultural pricing policy* Baltimore Johns Hopkins for the World Bank

Lindert P H (1991) Historical patterns of agricultural policy In C P Timmer (Ed) *Agriculture and the state* 29–83 Ithaca Cornell University Press

Miller T C (1991) Agricultural price policies and political interest group competition *Journal of Modeling* 13(4) 489–513

Mundlak Y (1978) On the pooling of time series and cross sectional data *Econometrica* 46(1) 69–85

Olson M (1965) *The logic of collective action* Cambridge MA Harvard University Press

Olson M (1985) The exploitation and subsidization of agriculture in developing and developed countries Proceedings of the Nineteenth International Conference of Agricultural Economists Malaga Spain

Peltzman S (1976) Toward a more general theory of regulation *Journal of Law and Economics* 19 211–248

Sah R K and Stiglitz J E (1987) Price scissors and the structure of the economy *Quarterly Journal of Economics* 102(1) 109–139

Sandler T (1992) *Collective action* Ann Arbor University of Michigan Press

Schultz T W (1978) *Distortions of agricultural incentives* Bloomington Indiana University Press

van Bastelaer T (1995) A collective action inquiry into the political economy of food pricing Working Paper No 152 Center for Institutional Reform and the Informal Sector (IRIS)