Political Economy of Agricultural Trade Interventions in Africa

Robert H. Bates
Harvard University
robert.bates.harvard.edu@gmail.com

Steven Block
Tufts University
steven.block@tufts.edu

Agricultural Distortions Working Paper 87, May 2009

This is a product of a research project on Distortions to Agricultural Incentives, under the leadership of Kym Anderson of the World Bank's Development Research Group. The authors are grateful for funding from World Bank Trust Funds provided by the governments of Japan, the Netherlands (BNPP) and the United Kingdom (DfID). This paper will appear in *Political Economy of Distortions to Agricultural Incentives,* edited by K. Anderson (forthcoming 2010).

Abstract

This paper uses new data on agricultural policy interventions to examine the political economy of agricultural trade policies in Sub-Saharan Africa. Historically, African governments have discriminated against agricultural producers in general (relative to producers in non-agricultural sectors), and against producers of export agriculture in particular. While more moderate in recent years, these patterns of discrimination persist. They do so even though farmers comprise a political majority. Rather than claiming the existence of a single best approach to the analysis of policy choice, we explore the impact of three factors: institutions, regional inequality, and tax revenuegeneration. We find that agricultural taxation increases with the rural population share in the absence of electoral party competition; yet, the existence of party competition turns the lobbying disadvantage of the rural majority into political advantage. We also find that privileged cash crop regions are particular targets for redistributive taxation, unless the country's president comes from that region. In addition, governments of resource-rich countries, while continuing to tax export producers, reduce their taxation of food consumers.

Keywords: agriculture, taxation, political economy

JEL codes: Q17, Q18, F13, O13

Contact author details:

Robert H. Bates
Eaton Professor of the Science of Government
Department of Government,
Harvard University,
1737 Cambridge St.,
Cambridge, MA 02138
Phone +1 617 496 0919
robert.bates.harvard.edu@gmail.com

Political Economy of Agricultural Trade Interventions in Africa

Robert H. Bates and Steven Block

This chapter explores the political economy of agricultural trade protection in Sub-Saharan Africa. It makes use of a new World Bank dataset of indicators of distortions to domestic prices of agricultural (and non-agricultural) commodities caused by government policies – trade taxes, non-tariff trade barriers, subsidies, or currency distortions.[1] When greater than zero, the indicators suggest that government policies favor farming; when the relative rate of assistance is below zero, it suggests policies have an anti-agricultural bias.

As indicated in chapter 2, governments in Africa, like those elsewhere, have adopted less distorting/more neutral policies since the 1980s. Increasingly their policies impact farming and other industries in a less biased manner. However, policies in Africa continue to alter prices in ways that discriminate against farming, and more so than in other developing country regions.

In this chapter we describe the levels of protection in our sample of 20 Sub-Saharan African countries[2] and the manner in which they vary; and, drawing from the literature on the political economy of agriculture, we advance and test a series of explanations for the patterns we observe.

---

[1] Anderson and Valenzuela 2008), based on a methodology outlined in Anderson et al. (2008). See the Annex for specific definitions of these indicators.

[2] The Sub-Saharan African countries in the sample are Benin (C), Burkina Faso (L), Cameroon (R,C), Chad (L), Cote d'Ivoire (C), Ethiopia (C,L), Ghana (C), Kenya (C), Madagascar (C), Mali (L), Mozambique (C), Nigeria (R,C), Senegal (C), South Africa (R,C), Sudan (L), Tanzania (C), Togo (C), Uganda (L), Zambia (R,L), and Zimbabwe (L). These countries account for no less than 90 percent of Sub-Saharan Africa's population, GDP, farm households and agricultural output. "C" indicates coastal; "L" indicates landlocked, and "R" indicates resource-rich. Note that for five of these countries (Benin, Burkina Faso, Chad, Mali, and Togo) the data refer only to cotton. We include these countries only in our analyses of agricultural exportables and tradables.

Pertinent features of Africa

Agricultural policies in Africa vary substantially across the continent. In their recent study of Africa's economic performance in its first fifty years of independence, Ndulu et al. (2007) stress the importance of differentiating between countries whose economies are resource rich,[3] landlocked, or coastal. These three different groups of economies behave as if possessing different production functions, they argue, and attempts to account for Africa's growth performance gain in explanatory power when taking this heterogeneity into account. The policies vary over time as well.

Figure 1 portrays the rate of protection of importable as opposed to exportable commodities, with negative numbers indicating a bias in favor of import-competing crops and thus against agricultural trade. This bias reached a low point around 1980 and then subsequently lessened during the period of market-oriented reforms (the 1980s and 1990s). In recent years, those in landlocked countries have tended to exhibit the least bias against agricultural trade while those in coastal states tend to exhibit the greatest.

The data in figure 2 suggest that Africa's governments (with the exception of those in landlocked countries) have tended to protect food crops, raising the level of domestic prices above those prevailing in world markets, while taxing cash crops. The distortions introduced by government policies have eroded over time, with nominal rates of assistance for cash crops converging toward zero. Within the region, governments of resource rich countries tend to provide the most favorable policy environment for producers of both food and cash crops,[4] while the governments of landlocked countries tended to impose the least.

[3] A country is classified as resource-rich if (i) starting in the initial year, current rents from energy, minerals and forests exceed 5 percent of Gross National Income (GNI); (ii) a forward-moving average of these rents exceeds 10 percent of GNI; and (iii) the share of primary commodities in exports exceeds 20 percent for at least a 5-year period following the initial year.

[4] However, resource rich countries still maintained a negative level of nominal assistance toward cash crops. See the Annex for details on the calculation of rates of assistance to food versus cash crops.

Figure 3 illustrates the relative rates of policy support for agriculture versus non-agriculture (RRA, the relative rate of assistance to tradables), demonstrating that the bias against agriculture has abated since the 1980s, but nonetheless remains. Here, too, the geographic distinctions are quite clear: governments in all three types of the countries discriminate against agriculture, but those in landlocked countries consistently discriminate the most while those that govern countries that are resource rich discriminate the least and governments in coastal economies consistently fall between these two extremes.

Figure 4 jointly summarizes the movement of these indicators. Constructed for each decade since the 1970s, the sequence of charts trace changes at the country level. Cells to the left of zero on the horizontal axis (TBI) reflect an anti-agricultural trade bias, while cells below zero on the vertical axis (RRA) reflect an anti-agriculture bias in sectoral policies.

The charts reveal that in the 1970s, nearly every country in the sample implemented policies that were both anti-agriculture and anti-trade.[5] The dispersion of trade bias was relatively greater than the dispersion of relative rates of assistance to agricultural as opposed to non-agricultural commodities. Over time, however, the country averages tended to converge, with the degree of convergence in trade bias exceeding that in the bias against agriculture. Despite these changes, no countries emerged as both pro-agriculture and pro-agricultural trade by the end of the sample period. Indeed, most remained in the cell that captures biases against both agriculture and agricultural trade.

In the sections that follow, we seek to explain these patterns.

Explaining policy choices in Africa: theoretical considerations

In accounting for variation in agricultural policies, researchers tend to focus on the level of development, as signified by the degree of structural transformation and corresponding differences in the level of per capita income (Kuznets 1966; Chenery and Taylor 1968). When doing so, many highlight the paradoxical position of agriculture in the political economy of

[5] Exceptions include Kenya, which adopted policies favoring agricultural trade, and Nigeria, which maintained a slightly pro-agriculture stance until the current decade.

development: when agriculture composes the single largest sector of the economy and farmers the single largest category in the labor force, then governments tend to manipulate prices in ways that lower the incomes of farmers; when, however, agriculture forms but a small portion of the GDP and farming a miniscule portion of the labor force, then governments tend to adopt policies that favor the fortunes of farmers. As we commonly assume that political power tends to derive from income and numbers, the relationship between the level of development and the nature of government policy therefore poses a paradox – one that is fundamental in the political economy of development.

To begin to unravel this paradox, most turn to Engel's law, which holds that for a given rate of increase in consumer income, there will be a less than proportionate rate of increase in the portion of income spent on food. The empirical relationship between average income and the size of the agricultural sector conforms to this regularity. And so too would the reversal in government policy: when people are poor and spend a large portion of their incomes on food, they demand that governments protect their interests by adopting policies that lower the costs of food; as incomes improve and food forms a smaller portion of the consumption bundle, however, pressures for governments to lower food prices would tend to decline (Bates and Rogerson 1980; Anderson, Hayami and Others 1986; Lindert 1991).

Our sample is drawn from the lower portion of the global distribution of income and, as seen in the Annex, the within-sample variance is low. Our sample set of countries could therefore be expected to exhibit a common preference for policies that favor the interests of consumers. As we have seen, however, variation around this common tendency remains. By controlling the impact of per capita income, as it were, our data thus afford us the opportunity to explore the relationship between policy choice and factors left out of the standard account.

Our arguments

One source of differences is variation ininstitutions. As changes in institutions mark the course of the recent history of Africa, they help to account for variations in policies over time. Differences in natural endowments constitute a second source of variation, with some being richly endowed and others not and many containing both rich regions and poor. Not being time varying, differences in these characteristics help to account for cross-country differences in agricultural policies. They do so, we argue, by influencing the politics of redistribution and

revenue extraction, both of which shape the choice of public policies, particularly toward cash crops for export.

Political institutions

By lobbying or voting, citizens affect the policy choices of governments. The voting size of the rural sector affects the way in which farmers can employ these channels.

Lobbying

When the rural population constitutes a large percentage of the national population, then agricultural production tends to lie in the hands of a large number of small producers, dispersed throughout the countryside. As no single producer can influence government policy, and as organizing so large and diverse a population is costly, the individuals' incentive to lobby is weak. In countries with large agricultural populations, agriculture should therefore constitute an ineffective interest group. In addition, when the portion of the population in agriculture is large, that which is urban is small. The number of non-rural consumers would then tend to be small and they would be spatially concentrated.

Consumers should therefore hold a relative advantage as lobbyists in countries with large agricultural populations. And we therefore expect governments in countries with large agricultural sectors to adopt relatively adverse policies toward farming (Olson 1965, Bates 1981, Anderson 1995).

Voting

However, the very factors – size and dispersal – that render farmers weak lobbyists can render them powerful in electoral settings (Varshney 1995, Bates 2007a,b). Where representation is achieved through electoral channels, and where rural dwellers constitute a large segment of the voting population, then politicians encounter powerful incentives to cater to the interests of farmers. In environments with electoral competition, politicians encounter electoral incentives that would impel them to resist the political pressures emanating from urban consumers.

Figure 5 captures the nature of political institutions in Africa. The 7-level scale depicted in this figure (described below) demonstrates the striking shift towards political competition over time. The index increases with the extent of electoral party competition (with level 7 being the most competitive). In the 1970s, over 80 percent of country-year observations fell at or below level 3 on this scale. In contrast, by 2000-2005, over 90 percent of observations were at level 6 or greater.

In the sections that follow, we present statistical evidence relating the governments' choice of policy to (a) the size of the rural sector, as measured by the share of the population that dwells in rural areas, and (b) to the nature of political institutions and in particular to the presence or absence of party competition in the selection of the head of state.

Regional redistribution

As noted by Ndulu and O'Connell (2007), a larger portion of Africa's economies are based on the extraction of natural resources than is the case in other regions of the world. One result is geographic inequality, arising from differences in natural endowments. While in advanced industrial societies the politics of inequality takes the form of class conflict, in Africa it often assumes the form of conflict between regions.

Roughly 80 percent of Africa's economies possess within-country regions that appear significantly more prosperous than others,[6] and in roughly two-thirds of those cases these relatively prosperous regions include producers of cash crops. Examples include the coffee industry in the relatively wealthy Central Province of Kenya, or the cocoa industry in the rich central districts of Ghana. Such regions may offer targets for those seeking resources to distribute to the poorer portions of the nation.

The impact of pressures for regional income redistribution depends, however, on the regional distribution of power. In places such as Kenya, where the long-serving head of state, Jomo Kenyatta, was from the agriculturally productive Central Province, he marshaled the power of the national government to defend the province's interests and resisted efforts to tax export agriculture (Bates 1989). In contrast, the political leadership in neighboring Tanzania came from the poor, semi-arid zones of the country, and employed the power of the state to tax regions, such

[6] See, for example, the data gathered by Nordhaus (2006).

as Kilimanjaro, made wealthy from the production of cash crops. Policies toward cash crops thus depend not only on regional differences in income but also on the regional allocation of power.

The revenue imperative

For many nations in Africa, agriculture constitutes the largest portion of the economy and agricultural commodities figure prominently among the goods traded. And for most African countries, trade taxes constitute the single largest source of public revenue. Insofar as governments seek to raise revenues, they are therefore likely to tax agriculture. Only when other major sources of revenue – such as mineral or petroleum deposits – are available could one expect governments to deviate from this pattern. Governments endowed with ample revenue, moreover, are better able to fund programs that would enable them to lower food prices for consumers. We should therefore expect them to attempt to a greater degree than others to adopt policies designed to lower the domestic price of food crops.

Summary

Based on the preceding discussion, our expectations therefore are that:

- agricultural taxation will decrease with declines in the rural population share;
- electoral competition will mitigate the negative effects of rural population share;
- the presence of an economically privileged region, all else being equal, will reduce support (increase taxation) for cash crops,
    - but the presence of a president from the privileged region will mitigate these effects; and
- resource-rich countries will impose less taxation on producers of agricultural exportables and simultaneously will impose less taxation on consumers of agricultural importables relative to those in international markets.

Comment [BB1]: see addition to p. 15.

Explaining policy choices in Africa: regression results

This section tests these hypotheses, using both parametric and non-parametric methods. Of central interest are the correlates of the relative rates of assistance for agriculture versus non-agriculture (RRA) and the nominal rates of assistance for agricultural importables and exportables (Table 1-3). Each table reports four sets of estimates, two (in columns 1 and 2) drawn from OLS models (with and without an interaction between rural population share and electoral competition); one drawn from a random effects model (column 3); and the last drawn from a system GMM model (column 4). The models include several control variables: per capita income (in logs), the extent of arable land, and the geographical situation of the country, with coastal location serving as the reference category.

Before commenting on the tests of our hypotheses, we first note the coefficients on the control variables. Those in table 1 and 2 confirm the absence of a relationship between the measure of per capita income, relative rates of assistance, and nominal rates of assistance for importables (most of which are food). In table 3, by contrast, the coefficient on income is positive and significant in all models, indicating that, as will be discussed, the political economy of export crops differs from that of food crops. Consistent with figure 3, the regressions in table 1 indicate that landlocked countries substantially favor the interests of other sectors over those of agriculture. In addition, we find (in table 2) that resource rich countries tend to lower the domestic price of importables, i.e. food, by comparison with the policy stance assumed in coastal economies. Viewing the share of land that is arable as a proxy for the overall importance of farming, the results in Tables 1 and 2 also suggest that the policy orientation of governments towards agriculture does indeed vary positively with the magnitude of this measure.

Rural population share and political institutions

We have argued that collective action on the part of farmers is more difficult the greater their numbers, but that electoral competition transforms numbers into a political advantage. We thus expect government policies toward agriculture to be more adverse to the interests of producers the greater is the rural dwellers' share of the population, with this effect being conditional on the nature of the party system.

As an indicator of the country's party system, we employ a measure contrived by Ferree and Singh (2002) and subsequently amended and adopted by the World Bank for its Database of Political Institutions (Beck et al. 2001, 2008). The indicator (the Executive Index of Electoral Competitiveness, or EIEC) measures the level of competition that occurs during the executive selection process. To a greater degree than other measures (i.e., Gastil's political and civil liberties indices), the EIEC is based on observable characteristics rather than subjective judgments. Unlike the Polity measures, moreover, it is invertible: given a score, an observer gains precise information regarding the political system. The indicator consists of seven levels as follows:

Level 1 -- No executive exists

Level 2 -- Executive exists but was not elected

Level 3 -- Executive is elected, but was the sole candidate

Level 4 -- Executive is elected, and multiple candidates competed for the office

Level 5 -- Multiple parties were also able to contest the executive elections

Level 6 -- Candidates from more than one party competed in executive elections, but the President won more than 75 percent of the vote

Level 7 -- Candidates from more than one party competed in executive elections, but the President won less than 75 percent of the vote.

We deem a party system competitive when the EIEC score is greater than 6. Note that we omit all consideration of the "quality" of electoral competition, including whether elections have been deemed "free and fair."

As can be seen in the Annex, the mean share of the rural population in our sample is approximately 70 percent. The value of EIEC exceeded 6 in approximately 38 percent of country/year observations.

Estimation strategy

Our generic specification is:

(1) $y_{it} = \alpha + \gamma_1 Elecomp_{it} + \gamma_2 Rurpopshare + \gamma_3 (Elecomp * Rurpopshare)_{it} + X_{it}\beta + \nu_i + \varepsilon_{it}$

where y_{it} is one of our key policy indicators for country i in year t, *Rurpopshare* is the share of a country's population living in rural areas, X is a vector of the control variables from our baseline specification, and v_i captures unobserved time-invariant country-specific effects. The interaction

term in equation (1) requires that we evaluate a linear combination of coefficients ($\gamma_1+\gamma_3$ * *Rurpopshare*) in order to assess the impact of electoral competition (which we will evaluate at low and high levels of rural population share), and ($\gamma_2+\gamma_3$) to assess the impact of rural population share when the electoral system is competitive. In selected cases, we also present semi-parametric results for key explanatory variables. For each left-hand side indicator we begin by excluding the interaction term from equation (1) while still allowing the measures of rural population and electoral competition to enter separately.

In order to assess the robustness of our estimates, we employ a series of estimators to analyze this specification. We begin by employing OLS, initially constraining $\gamma_3 = 0$, then including the interaction term in our fully-specified model.[7] We then exploit the panel structure of our data by employing two additional estimators. Most of the identifying variation lies in the cross-sectional dimension of the data: the "within" standard deviation in rural population share in our sample is only 3.6, as compared with the "between" variation of 10.7, relative to the mean of 70.6. As the fixed-effects estimator depends solely on within-country variation, we therefore employ a random effects estimator, a choice supported by the Hausman test. Lastly, given the tendency for hysteresis in policy choice, we also employ the system GMM dynamic panel estimator of Blundell and Bond (1998). Use of the GMM estimator helps to alleviate concerns with endogeneity that might arise were rural population shares and the adoption of competitive electoral systems may depend on factors that influence the dependent variable as well, and that had been excluded from the model.

Relative Rate of Assistance

Table 1 presents our results for RRA. As expected, the point estimate for the impact of rural population share in the absence of electoral competition is negative in all models, and positive in the presence of electoral competition, although in no case is it statistically different from zero.. Adding the interaction term permits a more nuanced analysis of the "shift" effect of party competition: at high levels of rural population share (85 percent, as compared with 50 percent),[8] in the OLS and RE models, electoral competition bears a positive and significant relationship with policy choices that favor the agricultural sector. While the coefficient for the GMM

[7] All OLS estimates use robust standard errors, corrected for clustering at the country level.
[8] Recall that the sample mean is roughly 75 percent.

estimate does not significantly differ from 0, it is greater than the effect of party competition on policy choice at low levels of rural population share by a margin of 23 percent (P = 0.024), based on the GMM estimate.[9]

To probe these relationships more deeply, we relax that assumption of linearity and estimate semi-parametric (or "partially-linear") models of the form:

(2) $$y_i = X_i\beta + g(Rurpopshare_i) + \varepsilon_i$$

where X includes all of the variables included above *except for* the rural population share, and $g(.)$ is an unknown function relating the dependent variable to rural population share. We estimate this remaining non-parametric relationship for the sub-samples with and without electoral competitiveness.

Figure 6 displays the semi-parametric relationship between RRA and rural population share while controlling for electoral competition. In the absence of competitive elections, relative assistance to agriculture declines rapidly as the rural population share increases above the sample mean. Competitive electoral systems appear to check the negative impact of larger rural populations.

Nominal Rate of Assistance to agricultural importables and exportables

Consistent with our hypotheses, we find in Table 2 that trade policy support for agricultural importables – largely consisting of food crops -- declines as a function of rural population share. When the dummy variable for party competition enters without the interaction term (controlling for average rural population share in column 1), it increases the nominal rate of assistance for agricultural importables by nearly 20 percent. When interacted directly with rural population share, the results reveal that the effect of electoral competition on nominal protection for agricultural importables depends critically on the level of rural population share. While not statistically different from zero at relatively low levels of rural population share, we find that electoral competition transforms high values of rural population share from a political liability into a political asset. At a high level of rural population share (85 percent), the estimates indicate

[9] The bottom rows of each table describe "total effects." The total effect of rural population share with competitive elections (e.g., the partial derivative of the regression with respect to rural population share) asks whether the slope coefficient of rural population changes when there is party competition. Conversely, the total effect of party competition (e.g., the partial derivative of the regression with respect to party competition) asks whether the shift effect of party competition varies with the rural population share.

a substantial and statistically significant benefit from electoral competition in all three models. Figure 7(a) captures graphically the relationship, while relaxing the assumption of linearity of the functional form.

Table 3 suggests that rural population share bears no relationship with the level of nominal protection of agricultural exportables. As seen at the bottom of that table, at high levels of rural population share producers of agricultural exportables do benefit from electoral competition, but the impact is small and of little significance. Figure 7(b) confirms the first finding, that nominal assistance for agricultural exportables in the absence of competitive elections is not a function of rural population share, while suggesting that party competition can reduce the burdens based on agriculture when the rural share of the population is high.

In important respects, then, the findings for importables and exportables differ, which suggests that the political forces that shape government policies toward them differ as well. It is our argument, further elaborated in the following sub-section, that the politics of cash crops is shaped by the forces of regionalism and revenue extraction to a greater degree than are the politics of food crops.

Regional inequality and presidential origin

Data collected by the authors indicate that most African states contain rich regions and poor, and that in roughly 70 percent of the instances in which the country is marked by regional inequality the region is prosperous in part because of the production of cash crops. Particularly in the case of cash crops, then, we would expect the politics of agricultural policy to be shaped by the politics of regional inequality, as poor regions seek to extract resources from rich, while rich regions seek to defend against their efforts.

To illustrate, consider the historic rivalries between the socialist systems of Tanzania and Ghana on the one hand and the “capitalist” systems of Kenya and Cote d’Ivoire on the other (Barkan (1994). In Tanzania, President Julius Nyerere drew his political support from the cities and the semi-arid lowlands; in Ghana, President Kwame Nkrumah drew his from the cities and the semi-arid north. Both seized a major portion of the revenues generated by the export of cash crops – coffee and cocoa, respectively – in order to finance projects designed to benefit their constituencies. In their neighboring states of Kenya and Cote d’Ivoire, by contrast, the

Presidents' political constituencies lay in the richer regions. In Kenya, Jomo Kenyatta's constituency was the heartland of the coffee industry; in Cote d'Ivoire, Houphouet Boigny's lay within the cocoa zone. Rather than endorsing regional equality, Jomo Kenyatta and Houphouet Boigny employed the power of the state to defend the fortunes of their wealthy regions from those championing the fortunes of less well endowed.[10]

The intuition imparted by these cases informs the models reported in table 4. Our estimating equation in this case is similar to equation (1), but with the focus now on dummy variables indicating the existence of a privileged cash crop-producing region and indicating presidential origin from a privileged region:

(3) $y_{it} = \alpha + \gamma_1 cashregion_{it} + \gamma_2 pres\_origin_{it} + \gamma_3 (cashreg * pres\_origin)_{it} + X_{it}\beta + v_i + \varepsilon_{it}$

where X includes all variables from the previous specifications.

In columns 1 and 2 of table 4, the dependent variable is an indicator of relative policy support for cash versus food crops; positive values indicate relatively greater support for cash crops and negative values indicate a bias against cash crops in favor of food crops.[11] Both coefficients are negative, although only the first is statistically significant. When the president is from the privileged region, however, then the support for cash crops rises; the coefficients on the respective indicator are positive and significant. And as seen in the last row of columns 1 and 2, when the privileged region produces cash crops and the president is from that region, the coefficients are again positive and significant.[12]

In columns 3 to 6, we explore the correlates of the respective components of the CFBI index. In columns 3 and 4, the dependent variable is the nominal rate of assistance for cash crops, while in columns 5 and 6 it is the nominal rate of assistance for food crops. For each dependent variable, we report estimates based on OLS and GMM models, the latter to enable us to control for the impact of hysteresis in policy choice.

The coefficients in columns 3 to 6 reconfirm that the politics surrounding cash crops differ from those surrounding food crops. For food crops (columns 5 and 6), the larger the share

[10] Following the rapid rise of cocoa and coffee prices in the 1970s, Houphouet Boigny did launch a series of efforts to promote the fortunes of the north. Subsequent events suggest that the wisdom of these efforts, as the diverging fortunes of the two regions exacerbated political tensions in Cote d'Ivoire.

[11] See the Annex for the specific definition of this "cash-food bias indicator (CFBI)."

[12] The bottom row of table 4 provides the partial derivative of the regression with respect to the dummy variable indicating that the president is from a privileged region. The question addressed in the last row is thus whether the shift effect of presidential origin differs when there is a privileged cash crop-producing region.

of the population in agriculture, the greater the tendency of the governments to intervene in ways that lower domestic prices relative to those prevailing in global markets. In addition, governments tend to alter this policy when they must secure electoral majorities in order to secure power. Neither tendency characterizes the treatment of cash crops, however (columns 3 and 4). Rather, policies toward cash crops appear to be shaped by the politics of regional inequality. In states in which cash crops are grown in "privileged regions," the government intervenes in ways that lower the incomes of farmers. The bias is reversed, however, when the President is from that region (as seen in the evaluation of the partial derivative in the last row of columns 3 and 4).

Revenue imperative

Policies toward agriculture are also affected by the manner in which governments secure their revenues. Governments in Africa have long employed marketing boards and other instruments to extract revenues from the exports of cash crops; and they have expended revenues in efforts to accommodate the interests of domestic consumers of food crops (Bates 1981, Krueger, Schiff and Valdés 1991).

The coefficients on "cash region" in table 4 are negative and significant in most models (columns 1-4). While consistent with a theory of revenue generation, these findings could also indicate efforts at regional re-distribution. The coefficients on the "resource rich" dummy variable are less ambiguous. They suggest that governments with alternative sources of revenues do not differentially tax cash crops (see columns 3 and 4), but tend to favor them relative to food crops (columns 1 and 2) by conferring substantial subsidies on the consumers of food (columns 5 and 6).

While we might expect governments with additional sources of revenue to reduce the pressures they place on agriculture, the results thus suggest the contrary. As seen in columns 3 and 4, governments from resource rich economies treat export agriculture no differently than do those in the coastal economies lacking such resources. And, as seen in columns 5 and 6, they adopt policies that loweri the domestic prices for food crops. Governments that are wealthier because of presiding over economies abundantly endowed with natural resources are thus not inclined to reduce the burdens they place on farmers. Note that our data do not allow us to

exclude an interpretation that treats governments as agencies of social welfare. If governments seek food security, the data might suggest those that are better endowed – i.e. resource rich – spend more on achieving food security. They may therefore confer subsidies on consumers. Without knowing the actual instruments employed, and whether they lower or increase the profits of farmers while lowering prices for consumers, we cannot discriminate between this interpretation and our own.

Conclusion

In this chapter, we have explored patterns of variation in the content of agricultural policies in Africa. We have looked at the impact of the government's need for revenues, the incentives for farmers to lobby, and their capacity to affect electoral outcomes. We have also explored the political impact of regional inequality, especially insofar as it is generated by cash crop production. These factors operate in ways that deepen our appreciation of the political roots of agricultural policies.

Specifically, the implications we can draw from the above results are as follows:

- Policies toward agriculture are often the bi-product of other political concerns, so analysts should take into account the broader political setting when addressing agricultural policies;
- While policy analysts should continue to focus on normative and welfare issues, they should pay close attention as well to the incentives faced by policy makers;
- Precisely because they shape the incentives faced by politicians, institutions matter; and
- The prospects for policy reform are greater in poor democracies than they are in poor countries that lack competitive elections.

References

Anderson, K. (1995), “Lobbying Incentives and the Pattern of Protection in Rich and Poor Countries”, *Economic Development and Cultural Change* 43(2): 401-23.

Anderson, K., Y. Hayami and Others (1986), *The Political Economy of Agricultural Production: East Asia in International Perspective,* London: Allen and Unwin.

Anderson, K., M. Kurzweil, W. Martin, D. Sandri and E. Valenzuela (2008), “Measuring Distortions to Agricultural Incentives, Revisited”, *World Trade Review* 7(4): 1-30.

Anderson, K., and E. Valenzuela (2008), *Estimates of Distortions to Agricultural Incentives, 1955 to 2007*, core database at www.worldbank.org/agdistortions.

Barkan, J.D. (1994), *Beyond Capitalism vs Socialism in Kenya and Tanzania,* Boulder CO: Lynne Rienner.

Bates, R. (2007a), "Domestic Interests and Control Regimes", pp. 175-201 in B. Ndulu, P. Collier, R. Bates and S. O'Connell (eds.), *The Political Economy of Economic Growth in Africa, 1960-2000,* Cambridge: Cambridge University Press.

Bates, R. (2007b), "Political Reform", pp. 348-390 in B. Ndulu, P. Collier, R. H. Bates and S. O'Connell (eds.), *The Political Economy of African Economic Growth, 1960-2000,* Cambridge: Cambridge University Press.

Bates, R.H. (1981), *Markets and States in Tropical Africa*, Berkeley and Los Angeles: University of California Press.

Bates, R.H. (1989), *Beyond the Miracle of the Market*, Cambridge: Cambridge University Press.

Bates, R.H. and W.P. Rogerson (1980), "Agriculture in Development: A Coalitional Analysis", *Public Choice* 35(5): 513-28.

Beck, T., G. Clarke, A. Groff, P. Keefer, and P. Walsh (2001), "New Tools in Comparative Political Economy: The Database of Political Institutions", *World Bank Economic Review* 15: 165-176.

Beck, T., P.E. Keefer and G.R. Clarke (2008), *Database of Political Institutions,* accessible at http://go.worldbank.org/2EAGGLRZ40

Blundell, R. and S. Bond (1998), “Initial Conditions and Moment Restrictions in Dynamic Panel Data Models”, *Journal of Econometrics* 87: 115-43.

Chenery, H.B. and L.J. Taylor (1968), "Development Patterns: Among Countries and Over Time", *Review of Economics and Statistics* 50(4): 391-416.

Ferree, K. and S. Singh (2002), "Political Institutions and Economic Growth in Africa: 1970-1995", in *Coping with Globalization: Cross-National Patterns in Domestic Governance and Policy*, edited by S. Chan and J. Scarritt, Boulder: Frank Cass.

Krueger, A.O., M. Schiff and A. Valdés (eds.) (1991), *The Political Economy of Agricultural Pricing Policy, Volume 1: Latin America, Volume 2: Asia,* and *Volume 3: Africa and the Mediterranean,* Baltimore: Johns Hopkins University Press for the World Bank.

Kuznets, S. (1966), *Modern Economic Growth,* New Haven and London: Yale University Press.

Lindert, P. (1991), "Historical Patterns of Agricultural Policy", pp. 29-83 in P. Timmer (ed.), *Agriculture and the State,* Ithaca: Cornell University Press.

Ndulu, B., P. Collier, R. Bates and S. O'Connell (eds.) (2007), *The Political Economy of Economic Growth in Africa, 1960-2000, 2 volumes*, Cambridge: Cambridge University Press.

Ndulu, B.J. and S.A. O'Connell (2007), "Policy Plus: African Growth Performance 1960-2000", pp. 3-75 in B.J. Ndulu, P. Collier, R.H. Bates and S. O'Connell (eds.), *The Political Economy of Economic Growth in Africa, 1960-2000*, Cambridge: Cambridge University Press.

Nordhaus, W. (2006), *The G-Econ Database on Gridded Output: Methods and Data*, Yale University, New Haven. http://gecon.yale.edu/gecon_data_%20051206.pdf

Olson, M. (1965), *The Logic of Collective Action*, Cambridge MA: Harvard University Press.

Varshney, A. (1995), *Democracy, Development and the Countryside,* Cambridge: Cambridge University Press.

World Bank (2007), *World Development Indicators 2007,* Washington DC: World Bank.

Annex: Policy indicators and other variables used

The principal indicators of trade interventions that we examine in this chapter draw on the World Bank's new Database of Agricultural Distortions (see Anderson and Valenzuela 2008 and, for the methodology behind it, Anderson et al. 2008). We propose models to explain agricultural distortions as indicated by nominal rates of assistance to agricultural tradables relative to non-agricultural tradables (the relative rate of assistance), as well as the nominal rates of assistance to agricultural importables and agricultural exportables (and the ratio derived from them, known as the Trade Bias Index).

For each commodity aggregates (x), the nominal rate of assistance when an ad valorem tariff is the sole intervention is calculated as:

$$(1) \qquad NRA\_x = \frac{E \times P(1+t_m) - E \times P}{E \times P} = t_m$$

t_m is tariff rate, E is the nominal exchange rate, and P is the dollar-denominated world price of the commodity. Anderson et al. (2008) provide a detailed discussion of how this basic formula is modified to incorporate additional distortions, such as taxes and subsidies on domestic production of the relevant commodities.

We also examine key ratios among these indicators. The relative rate of assistance captures the relative support given to agricultural versus non-agricultural tradables:

$$(2) \qquad RRA = \left[\frac{1+NRAag^t}{1+NRAnonag^t} - 1 \right]$$

Thus, when agriculture is relatively favored (disfavored) by trade interventions in agriculture versus non-agriculture, the RRA is greater (less) than zero. Similarly, Anderson et al. (2008) provide an indicator of trade bias within agriculture, by comparing the relative assistance to exportables versus importables (the trade bias index):

$$(3) \qquad TBI = \left[\frac{1+NRAag_x}{1+NRAag_m} - 1 \right]$$

The TBI is negative when interventions are relatively unfavorable to agricultural exportables (interpreted as a anti-trade bias).

Our analysis also makes reference to nominal rates of assistance to food crops and cash crops. To construct these aggregates, we use the nominal rates of assistance calculated by the World Bank data set, weighting within each category by the share in the value of production of each commodity within that category. Our food crop aggregate includes cassava, maize, millet, tubers, sorghum, wheat, rice, and yams. Our cash crop aggregate includes cotton, cocoa, coffee, nuts, sugar, tobacco, and tea. Analogous to the TBI, we calculate a "cash-food bias index" (CFBI):

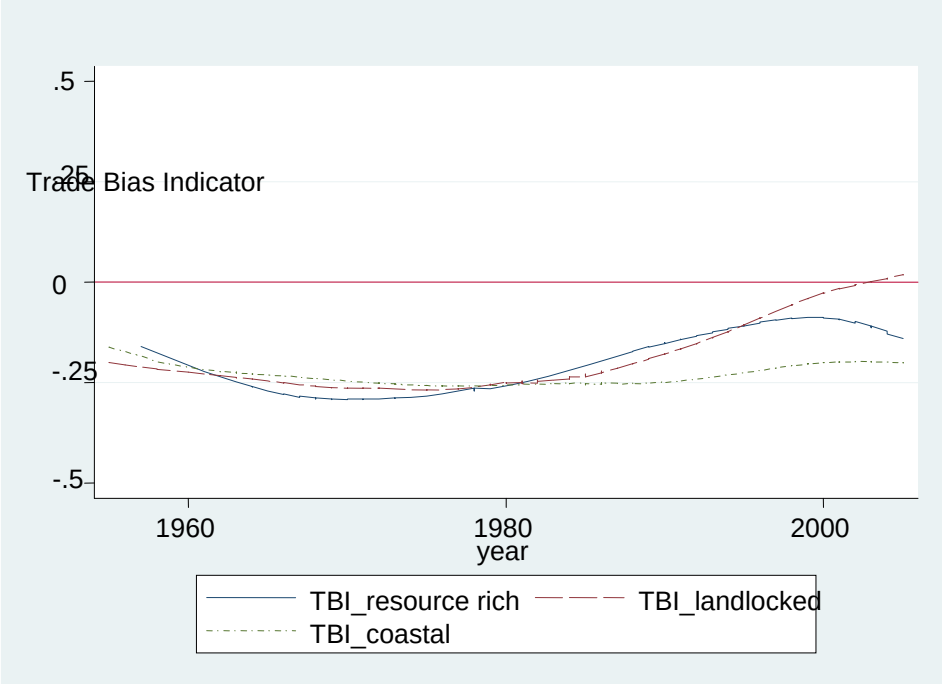
$$CFBI = \left[\frac{1 + NRAcashcrops}{1 + NRAfoodcrops} - 1 \right] \tag{4}$$

As in the previous cases, this indicator is greater (less) than zero when cash crops are favored (disfavored) relative to food crops by trade policy interventions.

The various variables used in our analysis and their sources are as follows:

Variable	**Units**	**Mean**	**Standard deviation**	**Source**
NRA		Prop'n		Anderson and Valenzuela (2008)
___agricultural tradables		-0.148	0.275	
___non-ag tradables		0.148	0.160	
___agricultural importables		0.073	0.412	
___agricultural exportables		-0.255	0.280	
___foodcrops		-0.048	0.294	
___cashcrops		-0.288	0.339	
RRA	Prop'n	-0.198	0.276	Anderson and Valenzuela (2008)
Anti-trade bias	Prop'n	-0.226	0.370	Anderson and Valenzuela (2008)
Competitive elections	0/1	0.317	0.466	Ferree and Singh (2002) Beck et al. (2001, 2008).
Rural population share	Prop'n	0.756	0.126	World Bank (2007)
Log real GDP per capita (constant 2000 US dollars)		7.090	0.610	World Bank (2007)
Landlocked	0/1	0.362	0.481	Ndulu et al. (2007)
Coastal	0/1	0.538	0.499	Ndulu et al. (2007)
Resource rich	0/1	0.176	0.381	Ndulu and O'Connell (2007)
Arable land share	Prop'n	0.11	0.092	World Bank (2007)
Cashcrop privileged region	0/1	0.723	0.448	Bates (2007)
President from privileged region	0/1	0.465	0.500	Bates (2007)

Figure 1: Trade Bias Index, Africa's resource rich, landlocked and coastal countries, 1955 to 2005



Source: Based on national TBI estimates in Anderson and Valenzuela (2008).

Figure 2: Nominal rates of assistance to food and cash crops, Africa's resource rich, landlocked and coastal countries, 1955 to 2005

(a) Food crops

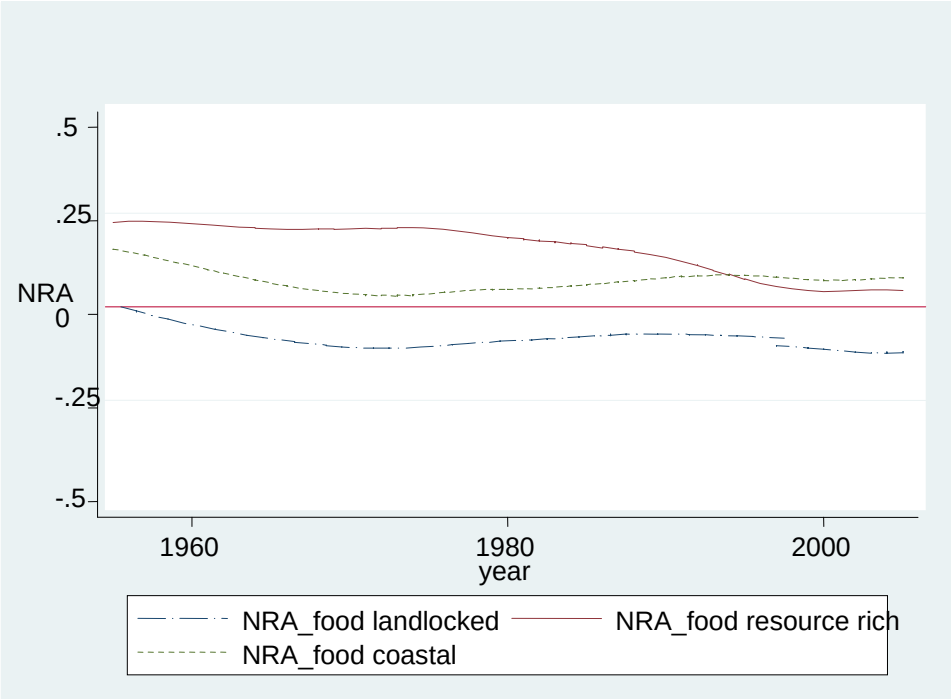
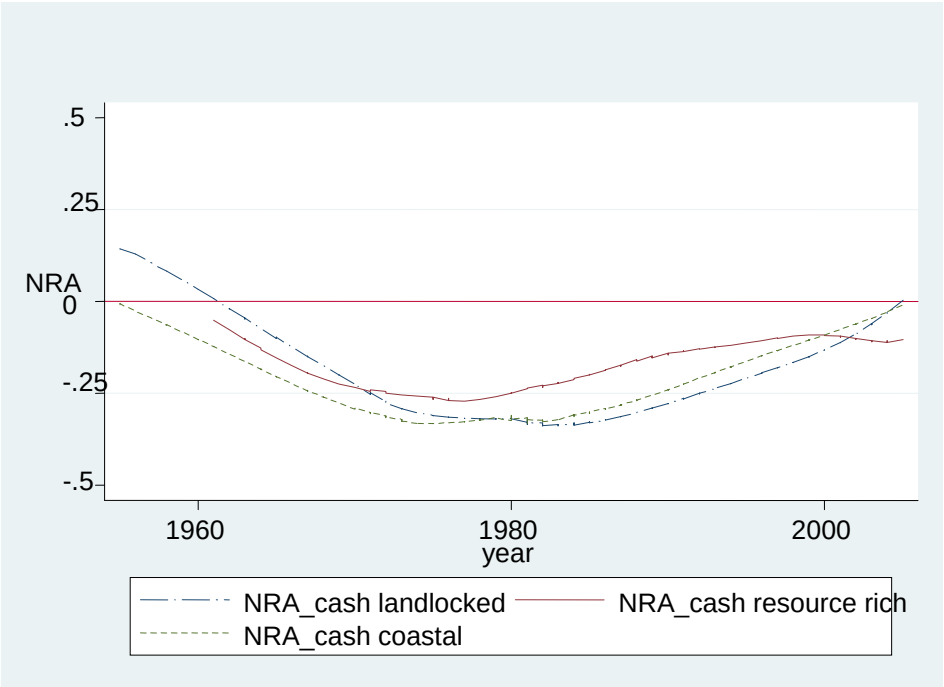


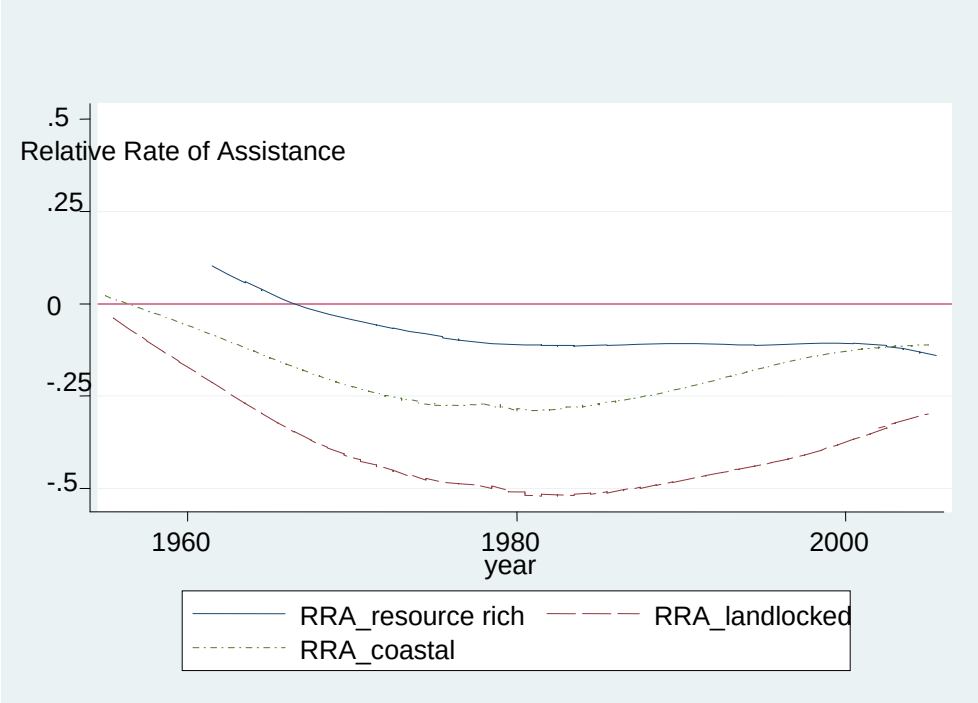
Figure 2 (continued): Nominal rates of assistance to food and cash crops, Africa's resource rich, landlocked and coastal countries, 1955 to 2005

(b) Cash crops



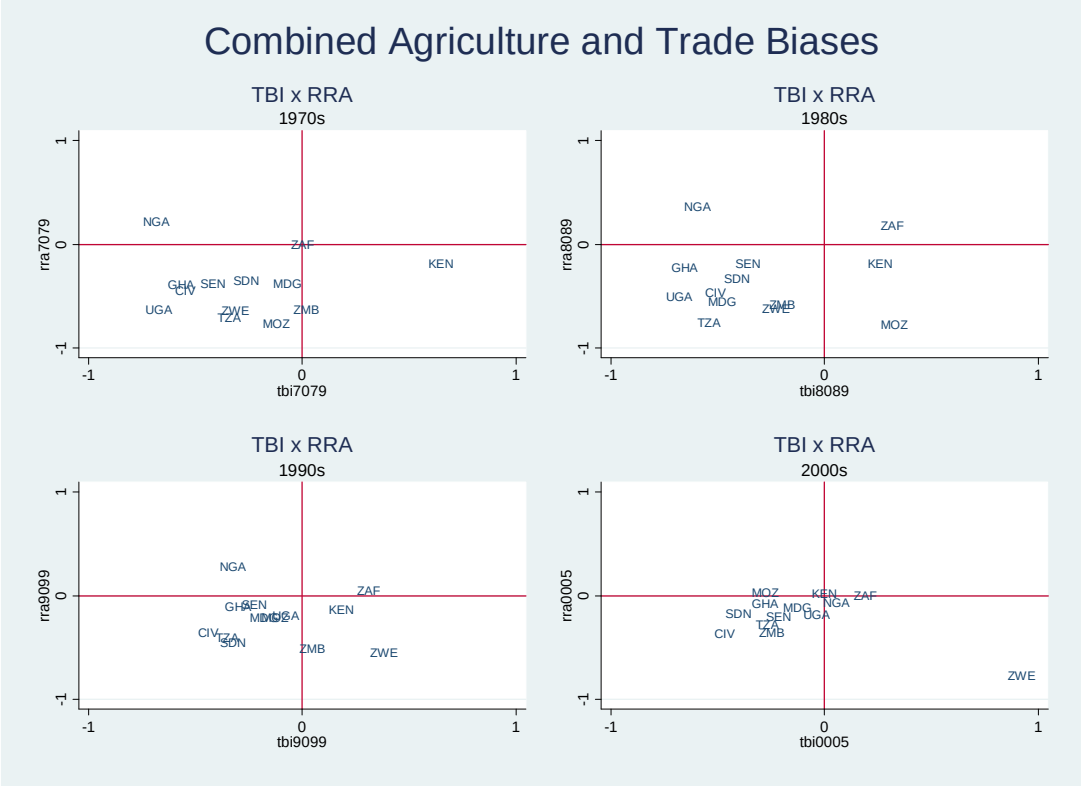
Source: Based on national NRA estimates in Anderson and Valenzuela (2008).

Figure 3: Relative rates of assistance to agricultural vs non-agricultural tradables, Africa's resource rich, landlocked and coastal countries, 1955 to 2005



Source: Based on national RRA estimates in Anderson and Valenzuela (2008).

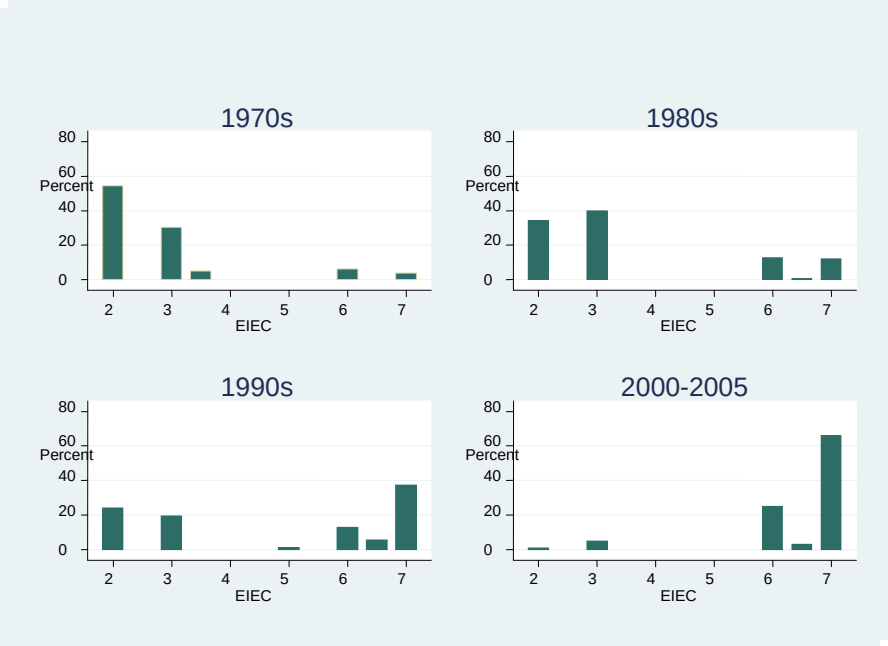
Figure 4: Relative rates of assistance and agricultural trade bias indexes, Africa, 1970 to 2005



Source: Based on national RRA and TBI estimates in Anderson and Valenzuela (2008).

Figure 5: Index of Electoral Party Competition, Africa, 1970 to 2005

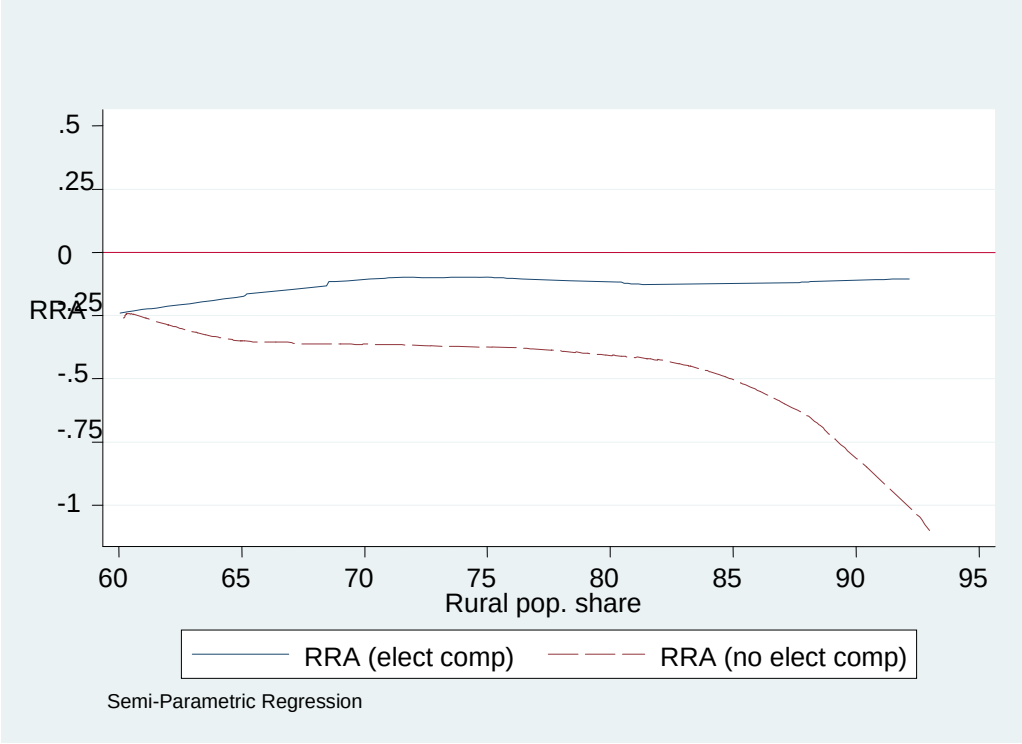
Comment [s2]: NOTE: this figure replaces figures 5a and 5b from the previous draft



Source: Database of Political Institutions 2006 (Webb et al. 2001, 2008)

Figure 6: Relative rates of assistance by rural population share, Africa, 1970-2004

Comment [s3]: NB: the horizontal axis isn't years -- it's rural population share



Source: Authors' analysis, based on national RRA estimates in Anderson and Valenzuela (2008).

Figure 7: Nominal rates of assistance by rural population share and trade focus, Africa, 1970-2004

(a) NRA for agricultural importables

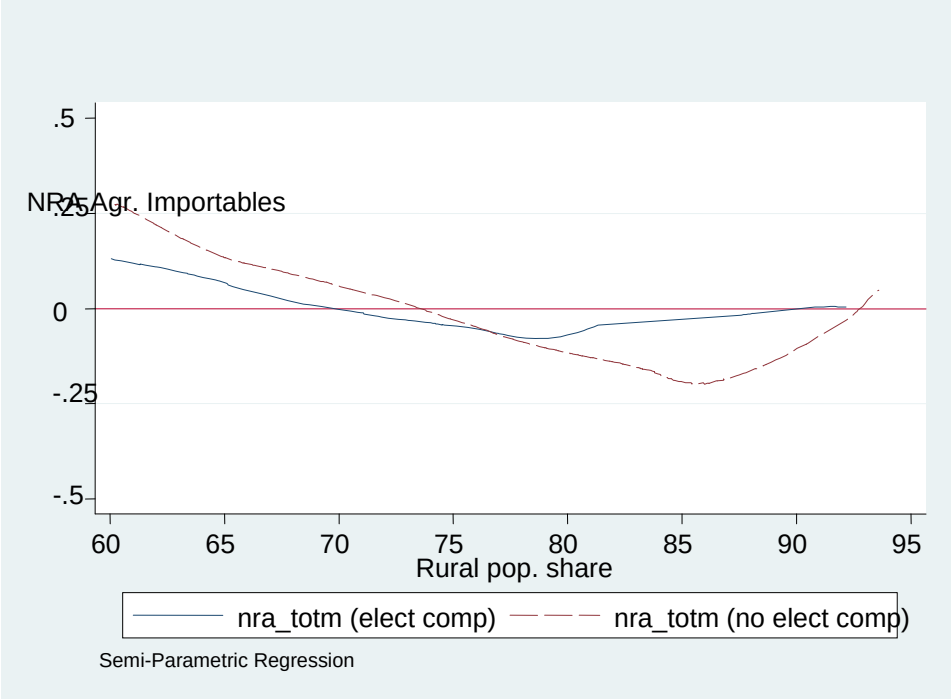
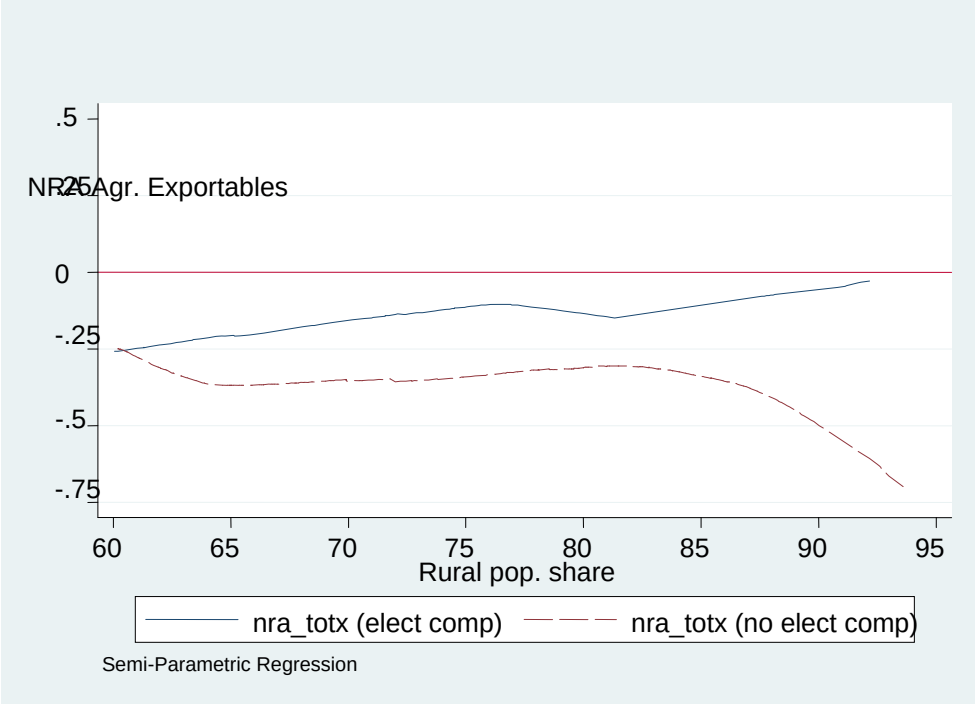


Figure 7 (continued): Nominal rates of assistance by rural population share and trade focus, Africa, 1970-2004

(b) NRA for agricultural exportables



Source: Authors' calculations, based on national NRA estimates in Anderson and Valenzuela (2008).

Table 1: Determinants of Relative Rate of Assistance (RRA), 1975 to 2004

	(1)	(2)	(3)	(4)
	OLS	OLS	RE[a]	SYS-GMM[b]
Rural pop. share	-0.0002	-0.003	-0.003	-0.002
	(0.006)	(0.006)	(0.006)	(0.003)
Elecomp dummy	0.072	-0.414	-0.547	-0.475
	(0.052)	(0.298)	(0.268)**	(0.162)**
Log Real GDP per cap	0.068	0.075	0.075	0.041
	(0.070)	(0.073)	(0.065)	(0.040)
Landlocked dummy	-0.263	-0.278	-0.285	-0.163
	(0.118)**	(0.121)**	(0.120)**	(0.067)**
Resource rich dummy	0.130	0.142	0.156	0.094
	(0.098)	(0.102)	(0.105)	(0.062)
Arable land share of total	0.017	0.017	0.017	0.008
	(0.003)***	(0.003)***	(0.003)***	(0.002)***
Elecomp x rural pop shr		0.007	0.009	0.007
		(0.005)	(0.004)**	(0.003)**
RRA (t-1)				0.467
				(0.107)***
Constant	-0.934	-0.781	-0.737	-0.297
	(0.861)	(0.864)	(0.799)	(0.443)
Observations	375	375	375	373
R-squared	0.52	0.53	0.53	
Total Effect of:				
Rural pop. Share w/ comp. elections		0.004	0.006	0.005
		(0.006)	(0.005)	(0.003)[†]
Comp. election, w/ rural pop shr = 50%		-0.063	-0.100	-0.142
		(0.086)	(0.069)	(0.041)***
Comp. election, w/ rural pop shr = 85%		0.182	0.213	0.090
		(0.105)*	(0.103)**	(0.063)

Robust standard errors (clustered by country) in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%
[†] P = 0.113
[a] Random effects model
[b] One-step system GMM
Year Dummies not reported.

Source: Authors' calculations

Table 2: Determinants of Nominal Rate of Assistance for Agricultural Importables, 1975 to 2004

	(1)	(2)	(3)	(4)
	OLS	OLS	RE	SYS-GMM
Rural pop. share	-0.016	-0.019	-0.017	-0.007
	(0.006)**	(0.007)**	(0.013)	(0.003)**
Elecomp dummy	0.198	-0.335	-0.438	-0.217
	(0.058)***	(0.541)	(0.560)	(0.277)
Log Real GDP per cap	-0.141	-0.133	-0.151	-0.054
	(0.100)	(0.105)	(0.121)	(0.038)
Landlocked dummy	-0.071	-0.086	-0.103	-0.032
	(0.123)	(0.128)	(0.166)	(0.055)
Resource rich dummy	-0.440	-0.426	-0.325	-0.120
	(0.116)***	(0.116)***	(0.184)*	(0.035)***
Arable land share of total	0.034	0.034	0.027	0.008
	(0.003)***	(0.003)***	(0.004)***	(0.002)***
Elecomp x rural pop shr		0.008	0.009	0.004
		(0.008)	(0.008)	(0.004)
NRA_agimpt (t-1)				0.675
				(0.087)***
Constant	2.102	2.269	2.285	0.834
	(1.096)*	(1.137)*	(1.736)	(0.428)*
Observations	375	375	375	374
R-squared	0.42	0.43	0.42	
Total effect of:				
Rural pop. Share w/ comp. elections		-0.011	-0.008	-0.003
		(0.007)	(0.013)	(0.003)
Comp. election, w/ rural pop shr = 50%		0.049	0.035	-0.0001
		(0.149)	(0.151)	(0.074)
Comp. election, w/ rural pop shr = 85%		0.319	0.367	0.152
		(0.148)**	(0.163)**	(0.077)*

Robust standard errors (clustered by country) in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%
[a] Random effects model
[b] One-step system GMM
Year Dummies not reported.

Source: Authors' calculations

Table 3: Determinants of Nominal Rate of Assistance to Agricultural Exportables, 1975 to 2004

	(1)	(2)	(3)	(4)
	OLS	OLS	RE	SYS-GMM
Rural pop. share	0.007	0.006	-0.002	0.007
	(0.006)	(0.006)	(0.008)	(0.005)
Elecomp dummy	0.091	-0.092	-0.414	-0.109
	(0.059)	(0.411)	(0.392)	(0.334)
Log Real GDP per cap	0.270	0.273	0.227	0.268
	(0.085)***	(0.089)***	(0.094)**	(0.066)***
Landlocked dummy	-0.175	-0.181	-0.159	-0.178
	(0.087)*	(0.090)*	(0.094)*	(0.076)**
Resource rich dummy	0.116	0.121	0.005	0.142
	(0.113)	(0.117)	(0.151)	(0.118)
Arable land share of total	0.004	0.004	0.011	0.002
	(0.004)	(0.004)	(0.007)	(0.004)
Elecomp x rural pop shr		0.003	0.007	0.003
		(0.006)	(0.005)	(0.005)
NRA_agexpt (t-1)				0.115
				(0.092)
Constant	-2.937	-2.879	-1.980	-2.714
	(0.959)***	(0.939)***	(1.205)	(0.627)***
Observations	375	375	375	374
R-squared	0.48	0.48	0.44	
Total Effect of:				
Rural pop. Share w/ comp. elections		0.008	0.005	0.009
		(0.006)	(0.008)	(0.005)[†]
Comp. election, w/ rural pop shr = 50%		0.040	-0.073	0.023
		(0.135)	(0.129)	(0.103)
Comp. election, w/ rural pop shr = 85%		0.133	0.165	0.116
		(0.098)	(0.099)*	(0.090)

Robust standard errors (clustered by country) in parentheses.
significant at 10%; ** significant at 5%; *** significant at 1%
[†] P = 0.113
[a] Random effects model
[b] One-step system GMM. Year Dummies not reported. Source: Authors' calculations

Table 4: The Role of a Privileged Cash Crop Region and Presidential Origin on Protection of Cash versus Food Crop Protection, 1975 to 2004

	(1)	(2)	(3)	(4)	(5)	(6)
	Dep Var: CFBI		Dep Var: NRA_cashcrops		Dep Var: NRA_foodcrops	
	OLS	SYS-GMM	OLS	SYS-GMM	OLS	SYS-GMM
Cash region	-0.255	-0.096	-0.218	-0.047	-0.021	-0.014
	(0.137)*	(0.058)	(0.078)**	(0.023)*	(0.078)	(0.043)
Pres. from privlg region	0.289	0.143	0.133	0.163	-0.087	0.008
	(0.159)*	(0.069)*	(0.110)	(0.029)***	(0.149)	(0.089)
Cash x pres from privlg.	-0.029	-0.025	-0.013	-0.126	0.085	-0.004
	(0.158)	(0.072)	(0.118)	(0.030)***	(0.204)	(0.122)
Rural pop. share	0.034	0.013	0.010	0.003	-0.019	-0.011
	(0.011)**	(0.006)**	(0.007)	(0.002)*	(0.006)***	(0.003)***
Comp. elections	-0.078	-0.066	0.040	0.002	0.111	0.081
	(0.074)	(0.041)	(0.074)	(0.025)	(0.039)**	(0.020)***
Log real GDP per cap.	0.377	0.146	0.116	0.024	-0.222	-0.134
	(0.206)*	(0.078)*	(0.156)	(0.035)	(0.074)**	(0.047)**
Landlocked dummy	-0.048	0.002	-0.088	-0.016	-0.051	-0.039
	(0.157)	(0.063)	(0.121)	(0.026)	(0.103)	(0.056)
Resource-rich dummy	0.571	0.229	0.021	-0.012	-0.491	-0.297
	(0.153)***	(0.087)**	(0.073)	(0.018)	(0.121)***	(0.057)***
Arable land shr of total	-0.026	-0.010	-0.000	0.001	0.026	0.015
	(0.005)***	(0.004)**	(0.003)	(0.001)	(0.006)***	(0.002)***
Lagged dep. var.		0.570		0.727		0.398
		(0.054)***		(0.062)***		(0.059)***
Constant	-5.414	-1.970	-1.981	-0.445	2.838	1.533
	(2.081)**	(0.809)**	(1.498)	(0.311)	(0.866)***	(0.478)***
Observations	249	247	249	248	249	247
R-squared	0.43		0.30		0.35	
Total effect of:						
Pres from prv if there is cash prv reg.	0.260	0.118	0.120	0.038	-0.001	0.003
	(0.110)**	(0.045)**	(0.083)	(0.020)*	(0.096)	(0.050)

Robust standard errors (clustered by country) in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%
Year dummies not reported.

Source: Authors' calculations