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*Political Freedom and the Response to Economic Incentives:  
Labor Migration in Africa, 1972 - 1987*

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Policy reforms in developing countries often address in isolation either an economic or a political problem. This study examines the interactions between political institutions and responses to economic incentives in a comprehensive framework. Migration data from thirty two African countries are used to quantify the statistical relationships between political institutions and labor migration out of agriculture. Regression results indicate that the presence of political freedoms and civil liberties increase the responsiveness of labor migration to economic incentives.

## I. Introduction

Development economists have increasingly promoted free markets and free trade between nations to enhance economic efficiency and stimulate economic growth. Free market prices appear now, more than ever, to be a prerequisite to a well-functioning economy and sustained economic growth. However, the efficient allocation of resources requires not only market generated price incentives, but also the ability of resource owners to acquire and respond to market incentives.

The mobility of labor and capital may be impaired by the government, particularly in countries characterized by military regimes or entrenched despots who benefit from preservation of the status quo. People and assets may be less mobile under authoritarian governments for two reasons. First, if market information regarding the relative returns of resources is limited by the government, resource mobility will be constrained, simply because the relative returns to factors in different uses are not known. Second, there may be costs, both pecuniary and nonpecuniary, associated with the movement of resources between locations and occupations. A government may "tax" migration by searching and seizing assets carried by migratory laborers. Resource mobility may also be limited by coercion, or policies that increase transactions costs associated with the transfer of resources within an economy.

Given these constraints, free-market prices can be considered necessary, but not sufficient conditions for the efficient allocation of resources and economic growth. Economies characterized by free markets may not perform well if political suppression of either market information or resource mobility is present. Previous studies on labor migration in developing nations have concentrated primarily on the economic costs and returns to migration. While

economic incentives have been confirmed to be important determinants of migration in general, and of rural to urban migration in particular, previous studies may be biased by the omission of variables that measure the levels of civil liberties and political freedom within the economy under investigation.

The fundamental hypothesis of this research is that the political institutions, and the freedoms extended under these institutions, have a significant impact on migration decisions. Political restrictions may result in a lack of complete information supplied to potential migrants concerning opportunities in other regions or occupations. Similarly, constraints on civil liberties may impose dire consequences on individuals who attempt to take advantage of economic opportunities by migrating. The outcome of these possibilities is the refutable hypothesis that economies characterized by greater political freedoms and civil liberties experience a higher level of resource mobility in response to economic incentives. This hypothesis was stated in 1776 by Adam Smith when he wrote The Wealth of Nations:

If in the same neighborhood, there was any employment evidently either more or less advantageous than the rest, so many people would crowd into it in the one case, and so many would desert it in the other, that its advantages would soon return to the level of other employments. This would at least be the case in a society where things were left to follow their natural course, where there was perfect liberty, and where every man was perfectly free to choose the occupation he thought proper, and to change it as often as he thought proper. (Chapter X).

The objective of this research is to identify and quantify the statistical relationships between political freedoms and the migration of labor out of agriculture in a cross-section of 32 African nations over the period 1972 to 1987. Africa provides a particularly well-suited and important venue to test this

hypothesis. Many African nations have been beset by dire poverty, poor economic performance, low productivity growth, huge increases in population, and increasing urbanization (Eicher). Politically, the continent remains troubled with seemingly constant changes of governments, coups, riots and repression (Turok). Given the severity of the economic and political problems that exist in Africa, a deeper understanding of the relationships between political institutions and economic behavior is crucial. The incorporation of institutional variables into economic analyses clarifies our knowledge of what has taken place in the past, and enhances our ability to prescribe policies in the future.

#### Ia. The Migration of Labor out of Agriculture

As economic development occurs, the agricultural sector becomes less prominent relative to the industrial sector. This is a result of the low income elasticity for food: as per capita income increases, a diminishing share of economic resources, including labor, are devoted to the production of agricultural products. An enormous literature on labor migration has provided many insights into the determinants of the flow of persons between locations and occupations. Perhaps the most obvious result of this literature is the enormity of the possible determinants of migration: "Migration of human beings is a complex personal, economic, social, demographic, psychological, and political process" (Graves and Clawson).

The literature has provided details about the type of individual who is most likely to migrate: "... young, better educated than the average resident, and predominantly male in Africa ..." (Yap, p. 239). Econometric studies have confirmed that "people move for economic gain, from poorer areas to wealthier areas" (Yap, p. 240). This forms the foundation upon which the present

investigation is built: potential migrants base their decision to migrate on the benefits and costs associated with migration. Previous studies have concentrated on the economic benefits of migration, in the form of higher anticipated earnings. This analysis considers economic incentives as the primary determinant of migratory behavior, but asserts that the economic motivation to migrate is conditioned by political institutions. Specifically, migration in response to a given economic incentives is expected to be higher in nations with greater political freedoms.

In Transforming Traditional Agriculture, T. W. Schultz described two reasons why political factors might result in an under investment in human capital. Since labor migration can be considered to be an investment in human capital (Sjaastad), these political forces are expected to affect the level of rural to urban migration. The first political handicap to the promotion of human capital is powerful landowners. According to Schultz:

Some poor countries are still saddled with politically influential landowners. It should be expected that this group would oppose and delay public expenditure for schooling for the rank and file of farm people. Such schooling in their view could serve no useful purpose and could be harmful. It might become a disturbance weakening their political position (Schultz, p. 197).

Migratory behavior is expected to be directly related to the level of education and the level of knowledge attained by farm laborers. If government officials and politically powerful landlords have costs associated with a change in the status quo, market information concerning opportunities outside of the traditional sector may be repressed.

The second political cause of an under investment in human capital cited by Schultz was the use of coercive power to attain ideological goals.

**According to Schultz:**

**In countries where ideology dictates that the state must be the landlord and farm people must be strictly workers ... the state proceeds to eliminate in principle all property rights ... In extreme cases, large numbers of farmers have been literally liquidated, among them the most skilled in agriculture (Schultz, pp. 198-99).**

**Carl Eicher reports a specific example of the use of force in Africa:**

**there are many unanswered questions about Tanzania's experiment with agrarian socialism, such as why President Nyerere authorized the use of coercion to round up farmers living in scattered farmsteads and forced them to live in villages. (p. 462).**

**Many African countries have attempted to slow the rapid urbanization process through policies that deter migration through either "moral suasion" or more severe incentives. This example clarifies why the incorporation of political institutions into models of migration is necessary to further our understanding of the determinants of the movement of labor.**

**Most previous studies of migration out of agriculture have not addressed the possibility of brute force imposed by the government. One exception is a study by T. Paul Schultz of rural to urban migration in Columbia, where differences in the level of violence had an impact on the rate of migration between regions.**

**Todaro's pathbreaking analysis of migrant behavior in Kenya emphasized the importance of expected, rather than actual, urban income and rural wages as the determinants of migration. Todaro's motivation was to enhance economic theory by including more realistic measures of human decision making. In this study we combine measurements of expectations of urban and rural wages with measurements of political freedom.**

### Ib. Measurements of Political Rights and Civil Liberties

In spite of overwhelming evidence that property rights and political institutions are important determinants of economic performance, economists have only recently incorporated political variables into empirical models of economic development. One example is Gerald Scully's empirical evidence that politically open societies attained higher rates of economic growth than politically closed nations during the period of 1960 to 1980.

Scully employed data on institutional variables that were taken from Freedom House, and include two measures of liberty: political liberty and civil liberty. Political and civil liberties are annually rated by the Freedom House using a scale of 1 (representing the highest degree of liberty) to 7 (representing the lowest degree of liberty). These ratings are constructed by averaging a checklist of different aspects of a nation's political rights and civil liberties (seven for political rights and thirteen for civil liberties). Each item in the list is given a score of zero, one or two, based on a set of procedures that is standard across countries and years. These raw scores are averaged and represented on the seven point scale.

Political rights, as defined by Freedom House, are those rights that enable individuals to participate freely in the political process. A political system is considered to be genuinely free or democratic to the extent that people have a choice in determining the nature of the system and its leaders. The definition of political freedoms also includes an individuals' freedom from domination by the military, foreign powers, totalitarian parties, religious hierarchies, economic oligarchies, or any other powerful group.

Civil liberties are considered to be the freedoms that develop views, institutions and personal autonomy apart from the state. The ranking of civil

liberties include a requirement for free and independent media, literature and other cultural expressions. Also included are rights to have open public discussion and freedom of assembly and demonstration. The ranking of civil liberties includes a requirement for free media, literature and other cultural expressions. Also included are rights to have open public discussions and freedom of assembly and demonstration.

The rankings, summarized in table 1, are based on the degree to which individuals in a state have control over those who govern. In the category of political rights, most Western democracies score a one, while nations ruled by despots who feel little constraint from public traditions score a seven. A civil liberties score of one represents nations in which publication and expression are not closed, especially if the intent is to influence the legitimate political process. A civil liberties score of seven represents nations where there is pervasive fear, little independent expression and a police state environment. Further descriptions of features of the freedom score are listed in table 1.

The cross section of African countries employed in this study includes a high degree of variability in the Freedom House rankings of political rights (2.1 to 7.0) and civil liberties (2.4 to 6.8). The nations of Botswana, Gambia and Mauritius are the most free countries in the sample of African nations, while Benin, Mali and Somalia are among the least free. Generally, countries in Africa tend to have more freedoms in civil liberties than in political rights.

The Freedom House rankings of civil liberties are expected to be particularly relevant in the study of labor "property rights, freedom of movement, choice of residence, ... exploitation by or dependency on landlords, employers, union leaders, bureaucrats or any other types of denigrating obstacles to a share of legitimate economic gains. " (Freedom House, p. 20).

The subjective nature of the rankings requires emphasis. The rankings are "not purely mechanical; they also reflect judgement". (Freedom House, p. 21).

While the ranking procedure is subjective to a degree, the measures of political rights and civil liberties provide an approximation for the degree of freedom that exists in a country. The rankings have been used to study the relationship between economic growth and political institutions in Scully and in McMillan, Rausser and Johnson.

## II. Theoretical Model.

We now turn to the development of a theoretical framework that incorporates political freedoms into an individual's decision to migrate. Following Sjaastad, migratory behavior is analyzed using a model of occupational choice that considers migration to be an investment in human capital. The economy is composed of two sectors: agriculture and nonagriculture, as in Mundlak. Consider an individual currently employed in agriculture, and facing two possible occupations: agriculture (a) and nonfarm employment (n). Occupational decisions are assumed to be made by comparing the discounted utility derived from each occupation over the individual's career, where  $t=0$  is the date of occupational choice, and  $t-T$  is the date of retirement. To simplify, assume that there are  $S$  individuals currently employed in the agricultural sector.

The utility of individual  $s$  is assumed to be an function of the expected annual earnings from working in agriculture in year  $t$ . Occupational choice can be characterized by the comparison of the discounted utility derived from expected earnings in agriculture ( $y_{at}^*$ ) and nonagriculture ( $y_{nt}^*$ ) over the remaining career of the individual, or maximization of the net utility function, where  $r$  is the discount rate:

$$(1) \quad NU_s = \int_0^T e^{-rt} U(y_{at}^*) dt - \int_0^T e^{-rt} U(y_{nt}^* - c_{ant}) dt$$

Migration is not costless; transactions costs and nonpecuniary, or psychic, costs are included in the term  $c_{ant}$ , which represents the annual costs of moving from agriculture to the nonagricultural sector. Migration is expected to occur when

net utility is negative, or when the lifetime utility derived from the nonfarm occupation rises above the expected lifetime utility derived from the nonfarm occupation rises above the expected lifetime utility from the current agricultural job, net of moving costs.

By summing annual earnings from  $t=0$  to  $T$ , annual earnings can be converted into career earnings in each occupation, given by  $Y_{af}^*$  and  $Y_{nr}^*$ . Annual migration costs ( $c_{ant}$ ) are also summed into career costs,  $C_{ant}$ , and the net utility function restated as:

$$(2) \quad NU_t = U(Y_{af}^*) - U(Y_{nr}^* - C_{ant})$$

Previous studies of migration have emphasized that off-farm migratory behavior is motivated by expected earnings in the nonfarm sector. Political institutions are expected to be an integral component of these expectations: governments can influence the expected annual earnings in the nonfarm sector by either providing misinformation about the magnitude of expected earnings or by limiting the quality of information that is used to form these expectations.

Assume that individuals can predict future agricultural earnings accurately, but that the government can influence the expectations of nonfarm earnings:

$$(3) \quad Y_{af}^* = Y_{af}; \quad Y_{nr}^* = Y_{nr} \pi_t, \quad 0 < \pi_t < 1$$

where  $\pi_t$  may be interpreted as a discount factor applied by risk averse individuals to uncertain or inaccurately forecast future earnings. The value of

$\pi_t$  is a function of the degree of freedom prevailing in a country at time  $t$  ( $Z_t$ ):

$$(4) \quad \pi_t = \pi(Z_t) \quad \pi'(Z_t) > 0$$

In open societies with no suppression of information or censorship,  $\pi_t = 1$ , and the expectations of future nonfarm earnings can be accurately predicted. In countries where the government systematically alters the expectation formation process, or where the quality of information is limited,  $\pi_t < 1$ , and expected future nonfarm earnings are reduced in magnitude. For example, expected earnings in the nonfarm sector could be systematically understated by a government interested in maintaining a large farm labor force.

Even in free-market economies where earnings are determined by the forces of supply and demand, political institutions can influence migration patterns. Governments have the ability to alter transactions costs through either financial incentives or coercion. The ability to respond to price incentives is expected to be directly related to the level of political freedom in a given nation. In extreme cases, such as forced relocation, the costs of changing occupations become a matter of life or death, and completely overwhelm the comparison of lifetime earnings.

In this scenario, expected earnings may not be altered, but the costs of migration are increased by government policies or political instability. The degree of civil liberties includes the ability of individuals to change occupations and locations, so the costs of transferring labor between the farm and nonfarm sectors are a function of the level of political freedom. Greater levels of civil liberties are directly related to the ability to choose and change locations, so there is a positive relation between  $Z$ , the degree of political freedom, and  $C$ ,

the costs of migration:

$$(5) \quad C_{ani} = C(Z_i) \quad C'(Z) > 0$$

Substitution of (3) and (4) into (2) yields the net utility of individual  $s$ , and depends on the interaction of political institutions interact with economic variables

$$(6) \quad NU_s = U(Y_{ai}^*) - U(Y_{ni}^*) \pi_i(Z_i) - C_{ani}(Z_i)$$

Occupational migration of individual  $s$  occurs when the net utility is negative ( $NU_s < 0$ ). To aggregate all individual decisions, an index function  $I_{as}$  is employed to distinguish migrants from nonmigrants, as in equation (3). The level of gross migration from occupation  $a$  to  $n$  ( $M_{an}$ ) for all  $S$  individuals is found by the summation of  $I_{as}$ , as in (7):

$$(7) \quad I_{as} = \begin{cases} 1 & \text{if } NU_s < 0 \text{ (migration occurs)} \\ 0 & \text{if } NU_s > 0 \text{ (migration doesn't occur)} \end{cases}$$

$$(8) \quad M_{an} = \sum_{s=1}^S I_{as}$$

Some persons may flow from occupation  $j$  to occupation  $i$ , so the level of net migration is simply  $M = M_{an} - M_{na}$ .

The specification of a migration equation that is suitable for empirical

testing is an extension of previous work by Mundlak and Barkley. Migration is limited to occupational migration between agricultural employment ( $L_a$ ) and nonfarm employment ( $L_n$ ). The number of employed persons in an economy in year  $t$  ( $L_t$ ) is equal to the sum of workers employed in the agricultural sector and nonfarm employment:

$$(9) \quad L_t = L_{at} + L_{nt}$$

Temporal changes in the sectoral labor force levels occur for two reasons. First, through additions to the labor force, determined by sectoral population growth rates ( $\lambda_a$  and  $\lambda_n$ ), and second, through the migration of labor between sectors, defined to be positive when workers leave agriculture:

$$(10) \quad L_{at+1} = (1 + \lambda_a) L_{at} - M_t$$

$$(11) \quad L_{nat+1} = (1 + \lambda_n) L_{nt} + M_t$$

Sectoral population growth rates are unavailable for African countries. Two assumptions are that these sectoral rates are equal to overall population rates, or that these growth rates vary in given proportion. Kuznets suggests that this ratio may be as large as 3:1 (rural growth rate to urban growth rate). This alternative assumption yields:

$$\hat{m}_t = \frac{(1 + \frac{\tilde{\lambda}}{(l_1 - \frac{1}{3}(1-l_1))}) L_{1t} - L_{1t+1}}{L_{1t}}$$

To measure relative returns, define  $P$  as the ratio of observed (actual)

nonfarm labor returns to observed agricultural returns ( $Y_{at}/Y_{nt}$ ). The larger the divergence between farm and nonfarm returns, the more individuals will find that the difference in earnings justifies migration (Mundlak). Because migrants make decisions based on the expected value of relative returns, we must relate expected earnings to actual earnings. This is accomplished in equation (13), where we define  $\gamma_t$  to be the inverse of the discount factor  $\pi_t$ :

$$(13) \quad P^* = \frac{Y_{at}}{Y_{nt}^*} = \frac{Y_{at}}{Y_{nt} \pi_t} = P \gamma_t$$

The government's influence on the ratio of labor returns occurs through the variable  $\gamma_t$ . The magnitude of  $\gamma_t$  is expected to decline with greater levels of political freedom, and in the case of perfect information concerning nonfarm earnings,  $\gamma_t = 1$ . In cases of restricted information,  $\gamma_t > 1$ , and  $P^*$  diverges from the ratio of actual labor returns,  $P$ . The rate of migration is specified as a function of the expected returns ratio,  $P^*$ , the costs of migration,  $C$ , and a vector of exogenous variables,  $X$ :

$$(14) \quad m = f(P^*, C; X)$$

This study focuses on the response of the migration rate to the actual returns ratio,  $P$ , and the degree of political freedom,  $Z$ . The expected directions of change can be derived by differentiating  $m$  with respect to the independent variables  $P$  and  $Z$ :

$$(15) \quad \frac{\partial m}{\partial P} = \frac{\partial m}{\partial P^*} \frac{\partial P^*}{\partial P} = \frac{\partial m}{\partial P^*} \gamma(Z) < 0$$

The derivative in equation 13 is negative because higher agricultural earnings

relative to expected nonfarm earnings induce lower rates of migration. The impact of an increase in political freedom can be found by taking the derivative of migration with respect to the degree of political freedom,  $Z$ :

$$(16) \quad \frac{\partial m}{\partial Z} = \frac{\partial m}{\partial P^*} \frac{\partial P^*}{\partial \gamma} \frac{\partial \gamma}{\partial Z} + \frac{\partial m}{\partial C} \frac{\partial C}{\partial Z}$$

Where there are two effects of freedoms on migration, both positive in sign. The first is an indirect effect which increases the responsiveness to a given price signal, and the second is a direct effect which changes the costs of migrating.

### III. Data

Annual migration figures are estimated using data from World Tables 1991, published by the World Bank. The agricultural percentage of the labor force series (the data which is most directly needed to calculate sectoral migration rates) is available for the period 1972 - 1980. However, a related series, the urban percentage of the population, is available for the entire period 1972 - 1987. We use this available series to extend the labor force series through 1987.

The agricultural percentage of the labor force ( $P_{it}^a$ ) is regressed on the urban percentage of the population ( $P_{it}^u$ ) for the years 1969 - 1980, for each of the 32 countries listed in Table 1.

$$(17) \quad P_{it}^a = \alpha_i + B_i P_{it}^u + \varepsilon_t$$

$$i = \text{Algeria, ..., Zimbabwe} \quad t = 1969, \dots, 1980$$

Using the parameters estimated in equation (1), a new series was created for  $P_{it}^{a*}$  which covers the period 1969 - 1987.

$$(18) \quad P_{it}^{a*} = \alpha_i + B_i P_{it}^u$$

$$i = \text{Algeria, ..., Zimbabwe} \quad t = 1969, \dots, 1987$$

Regression results (not reported here, but available upon request from the authors) indicate a relatively good fit, with  $r^2$  of over .99 in 25 of the 32 countries. One problem in the data is Algeria's large estimated slope, which when extrapolated into the 1980-1987 period results in only 9% of the labor force engaged in agriculture by 1987, compared with 31% engaged in agriculture in 1980. Since this is unrealistic, we substituted Egypt's estimated slope for Algeria, and adjusted the intercept so that the estimates match the

actual data in 1975.

The percent agricultural labor force series, when multiplied with country population estimates, and combined with annual country population growth rates, yields sectoral labor force series used to estimate the sectoral migration out of agriculture ( $m_{i,t}$ ). This migration series is summarized, for each country, in Table 1. Migration estimates range from a low annual average of .2% for Burundi to a high of 9.87% for Libya. This number indicates that out of every 1000 farmers in Burundi, each year 2 change occupations from agriculture to the nonagricultural sector.

The returns to labor in each sector of the economy are measured by the average product of labor in agriculture and nonagriculture. The ratio of returns is used as a measure of relative labor returns. Data on the sectoral value added in African countries come from the World Bank publication, African Economic and Financial Data. The returns to labor in each sector are estimated by the value added in each sector, divided by the previously estimated sectoral labor forces. This measure of average products for each sector is also reported in Table 1. The average product in the agricultural sector is lowest in the poorest countries: Burkina-Faso, Ethiopia, Lesotho, and Malawi. Average products in the nonfarm sector are highest in countries that have either diamond deposits, such as Botswana, or oil reserves, such as Algeria, Libya and Nigeria. The ratio of average products (also reported in Table 1) is generally less than one, although it is slightly larger than unity for Niger and close to unity for Ghana.

#### IV Results

Economic variables, migration rates and institutional variables described in section three are used to test the relationships developed in section two. Specifically, we estimate the following regression:

$$(19) \quad m_{it} = \alpha + \sum_{j=1}^{j=7} \beta_j Z_{jit} P_{it} + \sum_{k=1}^{k=K} \delta_k X_{kit}$$

where  $m_{it}$  is the sectoral migration rate in country  $i$  in year  $t$ ,  $P_{it}$  is the price signal: the ratio of sectoral average products in country  $i$  in year  $t$ ,  $Z_{jit}$  are dummy variable transformations of Freedom House ratings of civil liberties and political rights ( $Z_{jit} = 1$  if the Freedom House rating =  $j$ , 0 otherwise), and  $X_{kit}$  are  $K$  exogenous variables which also affect migration in country  $i$  and year  $t$ . Additional exogenous variables used in the regression are the level of per capita GDP, and the percentage of population in the agricultural sector.

This specification allows for the possibility of different effects in different institutional environments of economic incentives on sectoral migration, through the interaction of institutional dummy variables and the price variable. The important statistical tests of the paper focus on the equality of the estimated  $\beta_j$  in equation 1. If the hypothesis that the  $\beta_k$  are equivalent can be rejected, then this provides evidence that political and civil freedoms are an important filter which conditions the response of migration to economic incentives. Additionally, since we expect that political and civil freedoms aid, rather than hinder, the response to economic incentives, we expect that the estimated magnitude of  $\beta_k$  should be larger for the institutional dummy variables which represent the presence of greater freedoms. Thus, given our labeling conventions, we expect that (in absolute value)  $\beta_2 > \beta_3 \dots > \beta_7$ .

Regression results are reported in table three separating effects for different ratings of civil liberties, and in table four separating effects for different ratings of political rights. The first numerical column in these tables reports the coefficients estimated by ordinary least squares. The second column reports the probability that the estimated coefficient is zero, with standard errors computed using White's method of computing the variance/covariance matrix, since White's test indicated the presence of heteroscedasticity in the sample. The means of the dependant and independent variables, reported in the third and fourth columns, are used to compute the elasticities reported in the fifth column. Since each of the seven average product ratio/freedom house rating composite variables are right censored: equal to the average product ratio if the freedom house rating dummy variable is equal to one, equal to zero otherwise, the dependant and independent variable means are computed conditional on the composite variable not equal to zero. This accounts for the different values for the dependant variable means for the composite variables. A final calculation reported in these tables is the ratio of average products for which sectoral migration will equal zero. Zero migration represents an equilibrium where workers are indifferent to working in either sector. If this equilibrium occurs where average products are equalized (and thus their ratio is one), this implies no compensating differential need be paid to workers to compensate them for working in a less desirable sector.

These tables also report tests restricting coefficients across freedom house ratings. The first test restricts coefficients across all freedom house ratings groups. Next, we test sequentially, beginning with the most free rating, whether each rating group is statistically different from the adjacent more restrictive rating group. If this test is not rejected, then the two groups are

combined and the next adjacent group is tested for difference from this composite group, else it is assumed that the more free rating group represents a group different from others. The bottom block in the tables reports regression results, in a format identical to top block, of regressions imposing the restrictions not rejected in the sequential test procedure.

Table three reports results measuring the response of migration to differences in sectoral average products in environments differing by the Freedom House rating of civil liberties. The response is of the expected negative sign (a lower average product in the agricultural sector relative to the non agricultural sector induces migration out of agriculture), and is significant in all but the most restrictive civil liberties environment. In addition, societies with higher per capita GDP's and a lower percentage of their labor force in the agricultural sector experience greater migration. The sizes of these responses, measured by the elasticities, decline with a decrease in civil liberties. The elasticity of the response in the most free societies, measured by a civil liberties rating equal to two, is 1.0770, which exceeds the response in societies with civil liberties ratings equal to five, where the elasticity is .0979, which exceeds the non-significant or zero response in the most restrictive societies where the civil liberties are rated seven.

An F-test rejects the hypothesis that responses are similar across societies, in favor of the hypothesis that migration responses to price signals differ in environments of different freedoms. This F-statistic is 3.9910 and the hypothesis is rejected at a probability level of .0015. Sequentially testing restrictions across groups, we find that groups two and three are not statistically different (the F-statistic is 1.4961 and the probability level .2219), that groups two, three and four are not statistically different, but that group five is different

from the composite group containing ratings two, three and four. Group six is not different from group five, but group seven is differentiated from this composite group.

The bottom block in table three reports regression results with three aggregated groups: the first containing civil liberties ratings two, three and four, the second containing civil liberties ratings five and six, and the third containing civil liberties ratings seven. These results again confirm the hypothesis that the migration response to price signals is greater in environments where freedoms are greater. When dummy variables representing the civil rights categories were added to the regression, their estimated coefficients were insignificant, suggesting the absence of a direct effect of civil liberties on sectoral migration.

An alternative measure of freedom is the Freedom House's ratings of political rights. Table four reports regression results using this measure of freedoms in place of the civil liberties ratings. Results in table four are quite similar to results reported in table one, although there are some differences. Most importantly, societies with greater freedoms also experience the strongest migration response to price signals. While in the case of civil liberties this result was monotonic across the ratings, for political liberties there appears to be a gap. In the restricted regression results, the most free societies, those with political rights rated two, have the largest elasticity, .6393, of migration to average product ratio. Societies with political rights rated three or four have an insignificant migration response to prices, while in societies with political rights rated five the response is significant, but smaller than in the most free societies and the societies with political rights rated six or seven have the smallest significant elasticity. One conjecture which explains these results is that in the

process of building free political institutions, sectoral mobility is restricted as a transitional policy to maintain political support for these reforms. Additional research is needed to move this hypotheses beyond the level of conjecture.

The estimated elasticities are in the same range of previous estimates by Mundlak using a cross-section of 70 countries of 0 to .5 (increasing monotonically over the period 1951-1972), by Mundlak using Argentine data of 3.46 to 5.40, and by Barkley using United States data of 3.34 to 4.50. Interesting in these results, and consistent with our findings in Africa, is that elasticities are higher where political freedoms are greater.

Ratios of average products at which sectoral migration would be zero are also calculated and reported in tables three and four. There is an interesting relationship between freedoms and the calculated zero migration average product ratio: free societies have a lower ratio than non-free societies. This implies a bias in free societies towards rural and agricultural areas and a bias in non-free societies towards urban and non agricultural areas.

## V Sensitivity Analysis

The almost certain presence of measurement error in the aggregate economic statistics (a problem magnified in African countries), cautions the acceptance of the econometric results of section IV. Several diagnostics are available to measure the sensitivity of these results to the presence of measurement errors: reversed regressions, weighted regression, and a comparison of "between" and "within" estimators.

One procedure to evaluate the possible impacts of measurement error is reversed regressions. Klepper and Leamer show that in evaluating a regression with  $k$  independent variables:

$$(20) \quad y = \beta_{00} + \sum_{i=1}^k \beta_{0i} x_i$$

the coefficient estimates from the  $k$  "reversed" regressions:

$$(21) \quad x_j = \gamma_{j0} + \delta_j y + \sum_{i \neq j} \gamma_{ji} x_i \quad j = 1, \dots, k$$

which may be rewritten as:

$$(22) \quad y = \beta_{j0} + \sum_{i=1}^k \beta_{ji} x_i \quad j = 1, \dots, k$$

$$\beta_{j0} = \frac{-\gamma_{j0}}{\delta_j} ; \quad \beta_{ji} = \frac{-\gamma_{ji}}{\delta_j} \quad j \neq i ; \beta_{ji} = \frac{1}{\delta_j} \quad j = i$$

together with the directly estimated coefficient may provide bounds for the estimates of the coefficients. Specifically, if for each  $j$  the  $k+1$  estimates of  $\beta_{ji}$  are either all greater or all less than zero, then  $\max[\beta_{ji}]$  and  $\min[\beta_{ji}]$  provide

upper and lower bounds for the estimate of  $\beta_{ji}$ . If for some  $j$ , some estimates of  $\beta_{ji}$  are greater than zero while others are less than zero, while for the other  $k-1$  variables the above conditions hold, the assumption that this  $j$ 'th variable is measured without error allows the use of bounds for the other  $k-1$  coefficients.

Reversed regression results are reported in table five. The result is that only for the per-capita GDP variable do regression coefficients change sign. The assumption that this variable is measured without error would then allow us to bound the coefficients of the remaining variables, allowing for their probable measurement errors. Among the variables in the regression, the GDP variable is the most probable to be measured without error: measurement errors are most likely in the sectoral value added and in the sectoral labor force figures than in the aggregated GDP figures. These results suggest that even in the presence of measurement errors in sectoral average products and in sectoral labor forces, there is still evidence of a negative and statistically significant relationship between sectoral migration and the agricultural percent of labor force, and a negative and statistically significant relationship between sectoral migration rates and the ratio of sectoral average products.

These results are derived with the assumption that the  $r^2$  of the regression, after removing all errors of measurement, is 1 and that the  $r^2$  between erroneously measured observed variables and their correct but unobserved counterparts is 0. Making weaker assumptions allows tighter bounds on the coefficient estimates. Figures two and three plot the upper and lower bounds of coefficient estimates against assumed  $r^2$ 's of the regression, after removing all errors of measurement.

In Figure two, if there are no errors of measurement, then the maximum  $r^2$  is equal to the  $r^2$  of the direct regression, or .736. As errors of measurement

increase, then their potential removal increases maximum possible  $r^2$  of the direct regression. If errors of measurement account for all the error in the regression, the maximum possible  $r^2$  is one. Upper and lower coefficient bounds, calculated by a methodology described by Klepper and Leamer, are plotted for each of the average product ratio - civil liberties variables. The  $v$  which intersects the vertical axis at  $-.022$  represents bounds for the variable ratio | civil liberties = 2,3,4, ( $\beta_{234}^c$ ), while the  $v$  which intersects the vertical axis at

$-.00583$  represents the bounds for the variable ratio | civil liberties = 5,6 ( $\beta_{56}^c$ ). Note that  $-.022$  and  $.00583$  are the estimates of  $\beta_{234}^c$  and  $\beta_{56}^c$  in the direct regressions. The lower bound for  $\beta_{56}^c$  intersects the upper bound for  $\beta_{234}^c$  at a value of maximum  $r^2$  of  $.756$ , indicating the improvement in  $r^2$  (from  $.736$  to  $.756$ ) which may be due to removal of errors of measurement without overturning the hypothesis that (in absolute value)  $\beta_{234}^c > \beta_{56}^c$ . The hypothesis that  $\beta_{234}^c > 0$  (that the migration response to average products is greater in these societies than in societies with civil liberties rated 7) is insensitive to errors of measurement. The hypothesis that average product ratios affect migration is more robust to errors of measurement. This is tested by the maximum  $r^2$  at which the upper bound for  $\beta_{56}^c$  intersects the coefficient estimate = 0 line, or at  $r^2 = .8$

Figure three plots coefficient bounds for the effects on migration of the average product - political rights variables. At zero measurement error, representing a maximum  $r^2$  of  $.762$ , the  $v$  representing the effect of average product for political rights = 2 ( $\beta_{p_2}$ ) intersects the vertical axis at  $-.045$ , while the  $v$  represent the effect of average product for political rights = 5 ( $\beta_{p_5}$ ) intersects the vertical axis at  $-.018$  and the  $v$  representing the effect of average

product for political rights = 6 or 7 ( $\beta_{67}^p$ ) intersects the vertical axis at  $-.007$ . The hypothesis that  $\beta_2^p > \beta_5^p$  is not rejected so long as the removal of errors of measurement does not increase the  $r_2$  of the regression beyond  $.79$ .

A summary statistic, labeled gap in table 5, reports the portion of the gap in  $r^2$  between the direct regression  $r^2$  and 1 which may be due to measurement errors without overturning the measured signs of the coefficients in the direct regression. A value of g equal to zero means the allowance of even the slightest errors in measurement invalidate direct regression results, while a value of g equal to one means that the signs of the direct regression coefficients are robust to all types of measurement error. Estimated values for this test statistic of  $.24$  and  $.25$  indicate that the results are somewhat robust to errors in measurement of the independent variables.

Additional information is available which may reduce the sensitivity of estimates to measurement errors. We know when the censuses are conducted in each of the countries, and it is reasonable to assume that observations further away from these census years contain larger errors in measurement. Table 6 reports regression results where observations are weighted by  $1/(1+TC)$ , where TC is the time from the most recent census, and TC ranges from a minimum of 0 (for census years) to 17 (for countries which have never had a census). This weighting procedure gives larger weights to years which are closer to census years and smaller weights to years further removed from census years. Results are similar to the unweighted pooled regressions: migration responds in the predicted negative sign to the average product ratio, and the size of the response is larger where freedoms are greater.

Two additional estimators for panel data are the between and the within estimators. The between estimator averages the data across time for each cross-

sectional unit, while the within estimator adds dummy variables for each cross-sectional unit. Results for these estimators are reported in table 7 for the between estimator and in table 8 for the within estimator.

Institutional variables are treated slightly differently in the between estimation. The Freedom House ratings are averaged across time, and countries with an average rating less than five are grouped in a "free" category and those with average ratings greater than five are grouped in a "not-free" category. Differential responses of migration to price signals are estimated in table 7 for civil rights and for political rights measurements of freedoms. The results are similar to the pooled regression results: the price response is significant and of the expected sign, and is greater the greater are societal freedoms. These elasticities,  $-.44$  for free civil liberties and  $-.45$  for free political rights compare closely to the estimates of  $-.31$  for civil liberties and  $-.63$  for political rights in the pooled regressions.

Table 8 reports results of the within estimation. Dummy variables for 31 countries (Zimbabwe is excluded) are added to the estimation, but estimated coefficients are not reported. It is well known that the within estimator amplifies problems of measurement error, and this amplification is seen in the results in table 8. Estimated coefficients are generally insignificant, and are of the incorrect sign when significant. These results for the within estimator suggest that errors in measurement are likely present, and that diagnostics such as the reversed regression and the weighted regression are important additions to the pooled regression in understanding the sensitivity of results to measurement errors.

## VI. Conclusion

The theoretical notion that free-market prices provide signals which guide the efficient use of resources has achieved strong and growing empirical support. However, there have been few investigations into the relationship between political institutions and the ability of individuals to act on the information provided by market prices. This research has provided a first step towards an enhanced understanding of the link between economic signals and institutional constraints. The migration of labor out of agriculture in a cross section of 32 African countries was shown to be responsive to market signals that reflect the relative returns to labor in a given nation.

Regression results indicate that the effect of price signals on labor migration is conditional on the degree of political freedom and civil liberties: higher levels of political freedom result in greater rates of migration from agriculture to the nonfarm sector, given the price signal. The major implication for policy makers is that policies that are directed at correcting price signals alone may not be as successful as policies that also address institutional issues. Stated differently, policies that correct price signals will be more effective in environments where there is greater political and civil freedom.

Given the severity of the economic and political problems in Africa, this conclusion is timely and important. In a continent besieged by low productivity growth, high rates of population growth, and overwhelming political instability, a strengthened base of knowledge allows for an increased understanding of what has occurred in the past, as well as a foundation upon which to build policies for the future.

## Table 1 Definitions of Freedom House Ratings Categories

### Political Rights

- 1 Fully competitive electoral process and those elected clearly rule. Most West European Democracies belong here.
- 2 Although electoral process works and the elected rule, there are factors which lower rating of the effective equality of the process including: economic inequality, illiteracy, or intimidating violence.
- 3 through 5 Less effective implementation of democratic processes. Mexico, for example has periodic elections and limited opposition, but for many years its governments have been selected outside the public view by the leaders of factions within the one dominant Mexican party. Governments of states rated 5 sometimes have no effective voting processes at all, but strive for consensus among a variety of groups in society in a way weakly analogous to those of the democracies.
- 6 Does not allow competitive electoral processes that would give the people a chance to voice their desire for a new ruling party or for a change in policy. The rulers of states at this level assume that one person or a small group has the right to decide what is best for the nation, and that no one should be allowed to challenge that right. Such rulers do respond, however, to popular desire in some areas, or respect belief systems (Islam) that are the property of the society as a whole.
- 7 Political despots at the top appear by their actions to feel little constraint from either public opinion or popular tradition.

### Civil Liberties

- 1 Publications are not closed because of the expression of rational political opinion, especially when the intent of the expression is to affect the legitimate political process.
- 2 The police and courts have more authoritarian traditions than states rated 1. In some cases, they may simply have a less institutionalized or secure set of liberties.
- 3 through 5 May hold political prisoners and generally varying forms of censorship. Too often their security services practice torture.
- 6 Almost always have political prisoners; usually the legitimate media are completely under government supervision; there is no right of assembly; and often, travel, residence, and occupation are narrowly restricted. However, there still may be relative freedom in private conversation, especially in the home; illegal demonstrations do take place; underground literature is published, and so on.
- 7 There is pervading fear, little independent expression takes place even in private, almost no public expressions of opposition emerge in the police-state environment, and imprisonment or execution is often swift and sure.

Table Two  
Country Averages for Selected Data: 1972 - 1987

Country	Migratio Rate --%--	Average Product Ag -- 1980 U. S. Dollars --	Average Product Non-Ag -- 1980 U. S. Dollars --	Average Product Ratio	Political Rights	Civil Liberties
Algeria	3.94	463	2826	0.1638	6.1	6.0
Benin	2.38	192	573	0.3349	7.0	6.4
Botswana	3.24	152	2932	0.0517	2.1	3.1
Burkina-Faso	0.43	91	760	0.1202	5.3	4.6
Burundi	0.20	142	1009	0.1404	6.9	6.3
Cameroon	2.79	331	1855	0.1787	6.1	5.4
Cent. Afr. Rep.	2.05	182	761	0.2398	6.9	6.3
Chad	1.02	106	702	0.1507	6.6	6.5
Cote D'Ivoire	2.90	481	1998	0.2410	5.8	5.2
Egypt	3.15	238	715	0.3325	5.1	4.7
Ethiopia	1.12	61	245	0.2508	6.6	6.6
Gambia	0.70	132	1422	0.0926	2.4	2.8
Ghana	1.58	400	420	0.9514	5.9	5.0
Guinea-Bissau	0.61	115	396	0.2911	6.1	6.1
Kenya	1.03	149	1287	0.1159	5.3	4.7
Lesotho	0.74	82	1110	0.0741	5.1	4.6
Libya	9.87	873	14248	0.0613	6.4	6.2
Malawi	1.36	75	641	0.1171	6.4	6.6
Mali	0.54	152	745	0.2035	7.0	6.3
Mauritania	3.21	198	979	0.2019	6.4	6.0
Mauritius	1.12	599	1272	0.4709	2.2	2.4
Morocco	4.18	344	1313	0.2619	4.2	4.6
Niger	1.71	421	362	1.1614	6.9	6.0
Nigeria	1.16	441	2377	0.1855	4.8	3.9
Senegal	0.77	144	2194	0.0656	4.4	4.1
Sierre Leone	1.48	140	712	0.1969	5.2	5.0
Somalia	1.03	213	595	0.3572	7.0	6.8
Sudan	1.24	169	704	0.2399	5.4	5.5
Togo	1.15	150	1012	0.1482	6.8	5.9
Tunisia	3.00	546	1449	0.3766	5.6	5.1
Zambia	1.15	141	2201	0.0640	5.0	5.2
Zimbabwe	1.32	147	2402	0.0612	4.7	5.1

**Table Three**  
**Regression of Sectoral Average Product Ratio on Migration**  
**Allowing Differential Effects by Civil Liberties Ratings**

	Est. Coeff.	Prob=0	Mean Dep. Var.	Mean Ind. Var.	Elas.	Ratio mig=0
Constant	0.05108	0.0000				
Ratio   Civ. Lib. = 2	-0.03201	0.0159	0.0104	0.3499	-1.0770	0.8748
Ratio   Civ. Lib. = 3	-0.01457	0.0100	0.0208	0.1577	-0.1105	1.3875
Ratio   Civ. Lib. = 4	-0.02018	0.0017	0.0142	0.1933	-0.2747	0.9128
Ratio   Civ. Lib. = 5	-0.00819	0.0228	0.0191	0.2282	-0.0979	2.6434
Ratio   Civ. Lib. = 6	-0.00594	0.0005	0.0218	0.3025	-0.0824	3.9848
Ratio   Civ. Lib. = 7	0.00158	0.6820	0.0169	0.2384	0.0223	-10.3777
Per Capita GDP	0.00535	0.0000	0.0190	0.8493	0.2397	
Labor Force % Ag.	-0.05044	0.0000	0.0190	0.6799	-1.8083	

r squared: 0.7397 # obs: 505

Average Product Ratio | Civil Liberties Rating  
Coefficient Restriction Tests:

	F Statistic	Probability
2=3=4=5=6=7	3.9910	0.0015
2=3	1.4961	0.2219
2=3=4	0.7938	0.4527
2=3=4=5	2.2755	0.0790
5=6	0.6659	0.4149
5=6=7	2.9213	0.0548

	Est. Coeff.	Prob=0	Mean Dep. Var.	Mean Ind. Var.	Elas.	Ratio mig=0
Constant	0.04932	0.0000				
Ratio   Civ. Lib. = 2,3,4	-0.02240	0.0000	0.0154	0.2177	-0.3166	0.9165
Ratio   Civ. Lib. = 5,6	-0.00583	0.0010	0.0207	0.2710	-0.0763	3.8789
Ratio   Civ. Lib. = 7	0.00179	0.6382	0.0169	0.2384	0.0253	-9.1473
Per Capita GDP	0.00549	0.0000	0.0190	0.8439	0.2441	
Labor Force % Ag.	-0.04828	0.0000	0.0190	0.6799	-1.7309	

r squared: 0.7359 # obs: 505

**Table Four**  
**Regression of Sectoral Average Product Ratio on Migration**  
**Allowing Differential Effects by Political Rights Ratings**

	Est. Coeff.	Prob=0	Mean Dep. Var.	Mean Ind. Var.	Elas.	Ratio mig=0
Constant	0.05077	0.0000				
Ratio   Pol. Rts. = 2	-0.04512	0.0043	0.0156	0.2189	-0.6331	0.5499
Ratio   Pol. Rts. = 3	-0.00367	0.3606	0.0165	0.2184	-0.0486	5.0524
Ratio   Pol. Rts. = 4	0.00743	0.5680	0.0258	0.2070	0.0596	-3.2551
Ratio   Pol. Rts. = 5	-0.01689	0.0254	0.0157	0.1696	-0.1825	1.1360
Ratio   Pol. Rts. = 6	-0.00654	0.0192	0.0234	0.2456	-0.0686	3.8305
Ratio   Pol. Rts. = 7	-0.00659	0.0027	0.0166	0.3312	-0.1315	2.7663
Per Capita GDP	0.00539	0.0000	0.0190	0.8493	0.2414	
Labor Force % Ag.	-0.04950	0.0000	0.0190	0.6799	-1.7746	
r squared:	0.7631		# obs:	505		

Average Product Ratio | Political Rights Rating  
Coefficient Restriction Tests:

	F Statistic	Probability
2=3=4=5=6=7	2.86596	0.0146
2=3	8.48189	0.0037
3=4	0.90248	0.3426
3=4=5	3.69151	0.0256
5=6	3.01437	0.0832
6=7	0.00062	0.9801

	Est. Coeff.	Prob=0	Mean Dep. Var.	Mean Ind. Var.	Elas.	Ratio mig=0
Constant	0.05130	0.0000				
Ratio   Pol. Rts. = 2	-0.04556	0.0039	0.0156	0.2189	-0.6393	0.5446
Ratio   Pol. Rts. = 3,4	0.00047	0.9326	0.0216	0.2121	0.0046	-46.3671
Ratio   Pol. Rts. = 5	-0.01756	0.0162	0.0157	0.1697	-0.1898	1.0925
Ratio   Pol. Rts. = 6,7	-0.00683	0.0016	0.0120	0.2887	-0.1644	3.1684
Per Capita GDP	0.00535	0.0000	0.0190	0.8439	0.2380	
Labor Force % Ag.	-0.04999	0.0000	0.0190	0.6799	-1.7922	
r squared:	0.7621		# obs:	505		

32

**Table 5**  
**Reversed Regression Results**

**Civil Liberties**

Independent Variable	Direction of Minimization				
	m	rc234	rc56	pag	gdp
rc234	-0.02199	-0.06409	-0.24537	-0.07579	0.01364
rc56	-0.00556	-0.06207	-0.20391	-0.03769	0.01759
pag	-0.00048	-0.00166	-0.00327	-0.00022	0.00023
gdp	0.00001	-0.00000	-0.00002	-0.00000	0.00002

r squared 0.73590

r squared m 0.79936

Gap 0.24028

**Political Rights**

Independent Variable	Direction of Minimization					gdp	pag
	m	rp2	rp5	rp67			
rp2	-0.04569	-0.02460	-0.22427	-0.22109	-0.00837	-0.09977	
rp5	-0.01775	-0.08715	-0.16154	-0.30160	0.03494	-0.08274	
rp67	-0.00691	-0.03343	-0.11736	-0.14361	0.01337	-0.03039	
gdp	0.00001	0.00000	-0.00001	-0.00001	-0.00002	-0.00000	
pag	-0.0005	-0.00110	-0.00234	-0.00221	0.00015	0.00147	

r squared 0.7621

r squared m 0.82246

gap 0.25371

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**Table 6**  
**Weighted Regression Results**

**Civil Liberties**

	<b>Est. Coeff.</b>	<b>Prob=0</b>	<b>Mean Dep. Var.</b>	<b>Mean Ind. Var.</b>	<b>Elas.</b>	<b>Ratio mig=0</b>
<b>Constant</b>	0.05376	0.0000				
<b>Ratio   Civ. Lib. = 2,3,4</b>	-0.01884	0.0000	0.0154	0.2177	-0.2663	1.1318
<b>Ratio   Civ. Lib. = 5,6</b>	-0.00667	0.0057	0.0207	0.2710	-0.0873	3.5174
<b>Ratio   Civ. Lib. = 7</b>	-0.00139	0.8301	0.0169	0.2384	-0.0196	12.0729
<b>Per Capita GDP</b>	0.00529	0.0000	0.0190	0.8439	0.2354	
<b>Labor Force % Ag.</b>	-0.05346	0.0000	0.0190	0.6799	-1.9166	
<b>r squared:</b>	0.7304		<b># obs:</b>	505		

**Political Rights**

	<b>Est. Coeff.</b>	<b>Prob=0</b>	<b>Mean Dep. Var.</b>	<b>Mean Ind. Var.</b>	<b>Elas.</b>	<b>Ratio mig=0</b>
<b>Constant</b>	0.06452	0.0000				
<b>Ratio   Pol. Rts. = 2</b>	-0.08927	0.0000	0.0156	0.2189	-1.2526	0.3198
<b>Ratio   Pol. Rts. = 3,4</b>	-0.01155	0.0019	0.0216	0.2121	-0.1134	2.1853
<b>Ratio   Pol. Rts. = 5</b>	-0.03524	0.0000	0.0157	0.1697	-0.3809	0.6309
<b>Ratio   Pol. Rts. = 6,7</b>	-0.01163	0.0000	0.0120	0.2887	-0.2793	2.0992
<b>Per Capita GDP</b>	0.00430	0.0000	0.0190	0.8439	0.1913	
<b>Labor Force % Ag.</b>	-0.06458	0.0000	0.0190	0.6799	-2.3152	
<b>r squared:</b>	0.7190		<b># obs:</b>	505		

**Table 7**  
**"Between" Regression Results**

**Civil Liberties**

	<b>Est. Coeff.</b>	<b>Prob=0</b>	<b>Mean Dep. Var.</b>	<b>Mean Ind. Var.</b>	<b>Elas.</b>	<b>Ratio mig=0</b>
<b>Constant</b>	0.05400	0.0002				
<b>Ratio   Civ. Lib. &lt; 5</b>	-0.04106	0.0346	0.0165	0.1771	-0.4403	1.4147
<b>Ratio   Civ. Lib. &gt; 5</b>	-0.01261	0.1085	0.0208	0.2787	-0.1693	5.9107
<b>Per Capita GDP</b>	0.05996	0.0013	0.0194	0.1933	0.5974	
<b>Labor Force % Ag.</b>	-0.05157	0.0005	0.0194	0.2282	-0.6066	
<b>r squared:</b>	0.8494		<b># obs:</b>	32		

**Political Rights**

	<b>Est. Coeff.</b>	<b>Prob=0</b>	<b>Mean Dep. Var.</b>	<b>Mean Ind. Var.</b>	<b>Elas.</b>	<b>Ratio mig=0</b>
<b>Constant</b>	0.05116	0.0018				
<b>Ratio   Pol. Rights &lt; 5</b>	-0.04722	0.0414	0.0178	0.1699	-0.4496	1.6170
<b>Ratio   Pol. Rights &gt; 5</b>	-0.01248	0.2726	0.0199	0.2685	-0.1686	5.9200
<b>Per Capita GDP</b>	0.06456	0.0065	0.0194	0.1933	0.6433	
<b>Labor Force % Ag.</b>	-0.04988	0.0009	0.0194	0.2282	-0.5867	
<b>r squared:</b>	0.8896		<b># obs:</b>	32		

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**Table 8**  
**"Within" Regression Results**

**Civil Liberties**

	<b>Est. Coeff.</b>	<b>Prob=0</b>	<b>Mean Dep. Var.</b>	<b>Mean Ind. Var.</b>	<b>Elas.</b>	<b>Ratio mig=0</b>
<b>Constant</b>	0.09319	0.0000				
<b>Ratio   Civ. Lib. = 2,3,4</b>	0.01629	0.0202	0.0154	0.2177	0.2302	-1.1280
<b>Ratio   Civ. Lib. = 5,6</b>	0.01126	0.0412	0.0207	0.2710	0.1475	-1.7756
<b>Ratio   Civ. Lib. = 7</b>	0.00517	0.3718	0.0169	0.2384	0.0730	-1.7774
<b>Per Capita GDP</b>	-0.00079	0.4172	0.0190	0.8439	-0.0350	
<b>Labor Force % Ag.</b>	-0.10984	0.0000	0.0190	0.6799	-3.9378	
<b>r squared:</b>	0.9367		<b># obs:</b>	505		

**Political Rights**

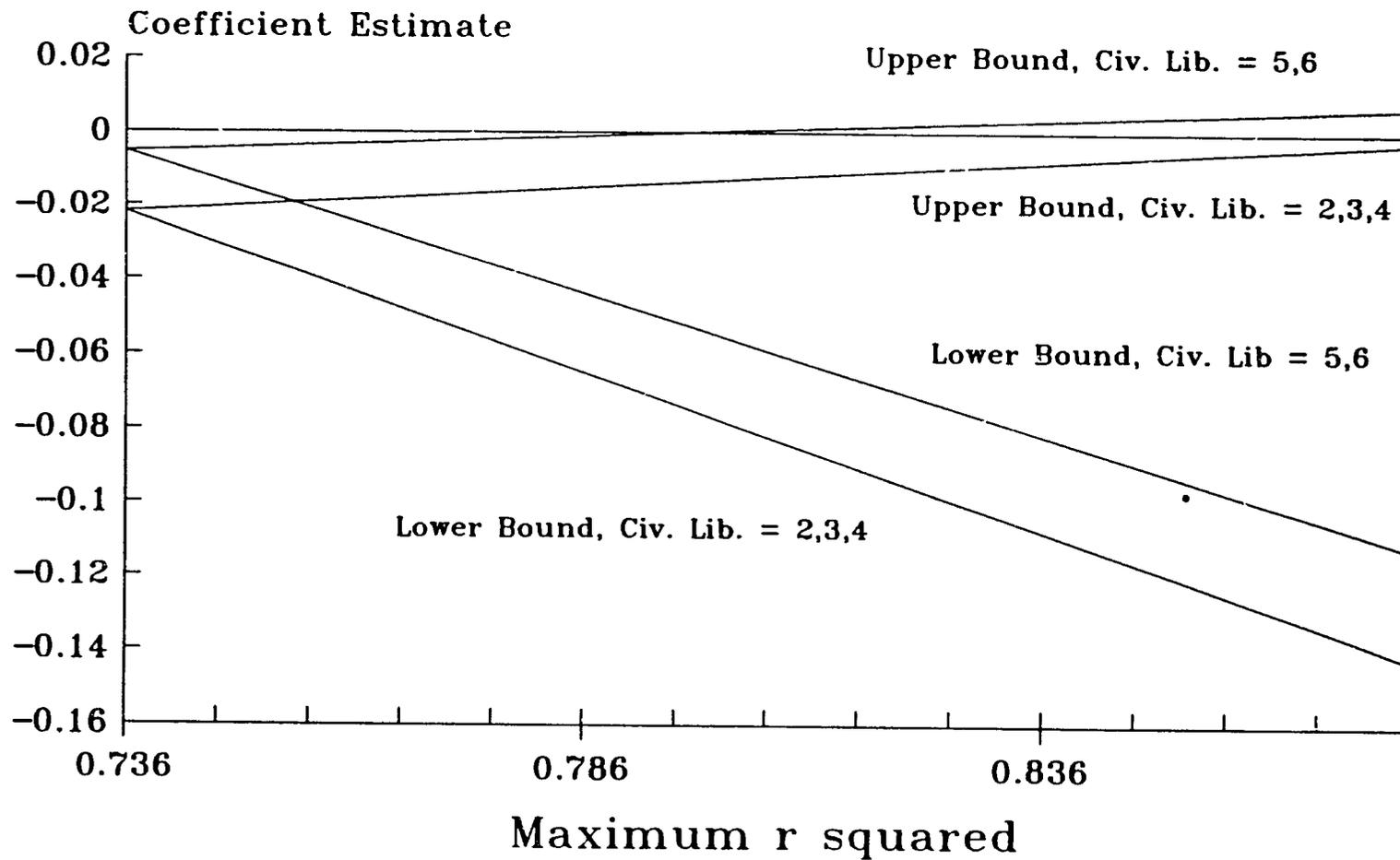
	<b>Est. Coeff.</b>	<b>Prob=0</b>	<b>Mean Dep. Var.</b>	<b>Mean Ind. Var.</b>	<b>Elas.</b>	<b>Ratio mig=0</b>
<b>Constant</b>	0.08952	0.0000				
<b>Ratio   Pol. Rts. = 2</b>	0.00330	0.5190	0.0156	0.2189	0.0464	-7.2399
<b>Ratio   Pol. Rts. = 3,4</b>	0.02234	0.0007	0.0216	0.2121	0.2193	-0.9276
<b>Ratio   Pol. Rts. = 5</b>	-0.00076	0.8816	0.0157	0.1697	-0.0082	21.5273
<b>Ratio   Pol. Rts. = 6,7</b>	0.00694	0.0682	0.0120	0.2887	0.1670	-2.4381
<b>Per Capita GDP</b>	-0.00064	0.5269	0.0190	0.8439	-0.0285	
<b>Labor Force % Ag.</b>	-0.10518	0.0000	0.0190	0.6799	-3.7707	
<b>r squared:</b>	0.9428		<b># obs:</b>	505		

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# Figure 2

## Measurement Error Bounds

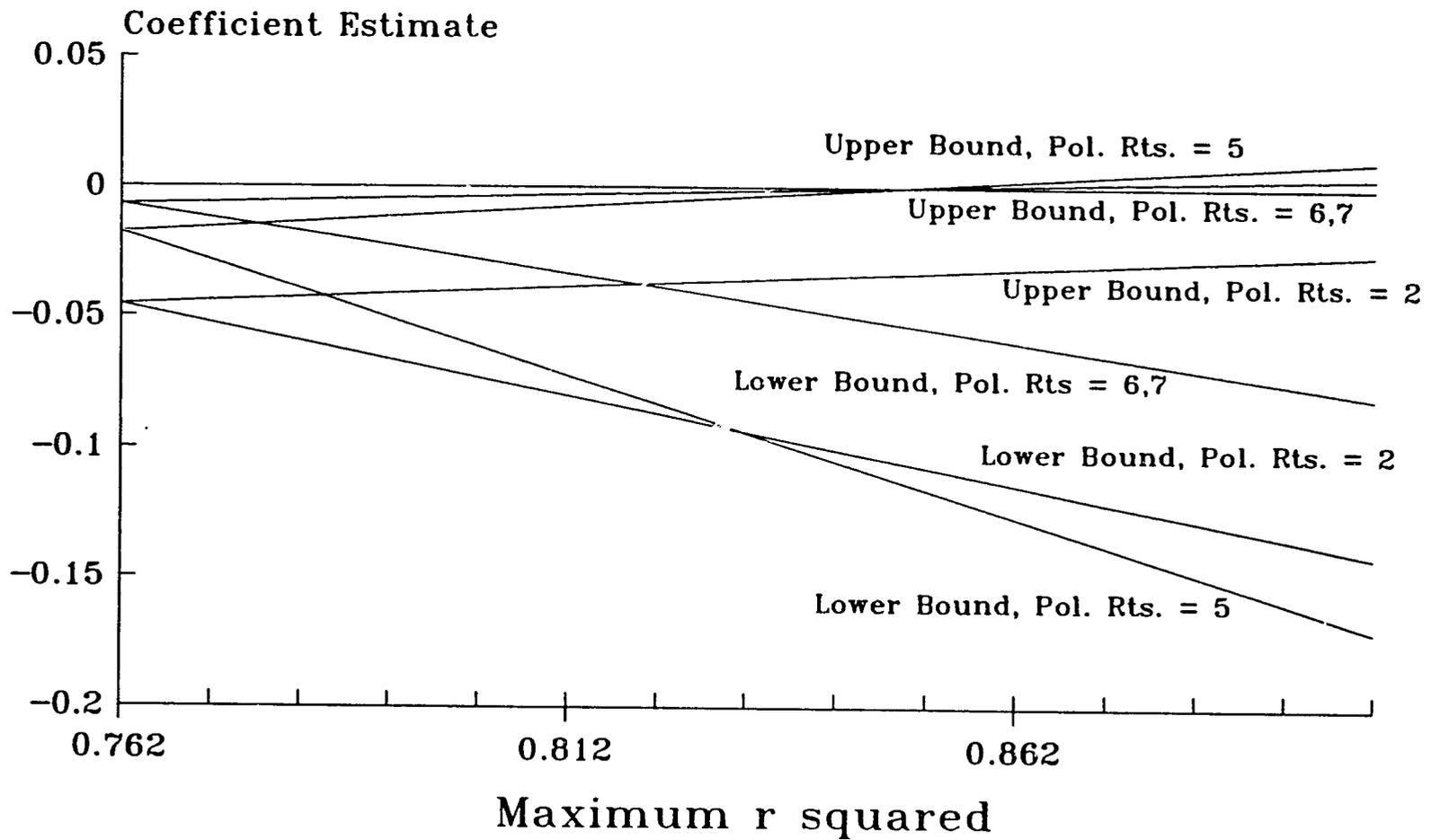


Effect of Ratio | Civil Liberties

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# Figure 3

## Measurement Error Bounds



Effects of Ratio | Pol. Rights

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