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**Values and Economic
Performance: Theory and
some Evidence from Kenya**

By

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Abstract

Policy, saving rates, human capital, etc. are possible explanations for poor economic performance, but while these factors are changeable, underdevelopment persists. Looking for an unchangeable factor, we construct a theory for the effect of values, such as moral values, risk-taking, and responsibility to others, on economic performance, and demonstrate it using a model in which responsibility for parents prevents development. We construct data of economic performance and values of seven tribes in Kenya by inferring values from children's stories, and verify the model. Thus, we open a door for the quantitative analysis of the effect of values over the economy.

KEYWORDS: economic development, values, social norms, Kenya

JEL CLASSIFICATION: A13, O10, O55, Z10

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Values and Economic Performance: Theory and some Evidence from Kenya

I. Introduction

Human capital (education and health), government share of the output, macroeconomic stability, investment share, openness to trade, rule of law, religion, geography (such as distance from the equator), and many other variables have been suggested as an explanation for differences in standards of living, output and economic growth (see, for example, Barro, 1991, Sala-i-Martin, 1997, and Eicher, Papageorgiou and Roehn, 2007).¹

However, almost all these factors, besides geography, are man-made. Policy, educational decisions, investment, etc., are all decisions of the inhabitants of a given country. Geography is indeed an exception, but (1) it explains little of the differences between countries, and more important (2) institutions trump the effect of geography and trade (Rodrik, Subramanian and Trebbi, 2004). Institutions, which influence the way decisions are made, are affected by their historical origin (Acemoglu, Johnson and Robinson, 2000). However, even though the origin matters, the people living in a given country or other relevant unit change the institutions over time (North, 1990). Therefore, the people are responsible for the variables explaining differences between countries, and we need to focus on the differences between people. Since it is hard to believe that physical differences explain variation in economic performance between groups, and differences in intelligence should have been captured in the education variables mentioned above (yet, many education variables are often found insignificant, and some are even found to be negative; see for example Eicher, Papageorgiou and Roehn, 2007),

¹ Levine and Renelt (1992) consider most of these variables to be fragile, but the vast majority of the literature claims that many of these variables can explain some of the differences between countries.

we are left with differences in *values*, such as *attitude to hard work, entrepreneurship, collaboration, risk-taking, altruism, integrity, caring for others, law-abiding, just reward* and *morality*. Accordingly, our main goal in this paper is to investigate whether different values of different groups may lead to differences in economic performance of these groups.

The macroeconomic literature treated very few values, and most of the discussion regarding values was very general (see Guiso, Sapienza and Zingales, 2006, for a literature survey). Religion has been considered in the literature (starting with the influential work of Max Weber), but since religion comprises a cluster of values, it does not allow the isolation of the effect of any particular value. *Risk avoidance* received substantial attention in the microeconomic literature, but macroeconomic growth literature widely ignores it by assuming risk-neutrality, or identical risk avoidance among agents. Greif (1994) addresses the role of cultural beliefs (expectations) in equilibrium, but not the role of the values and norms. Akerlof (2007) motivates this discussion by demonstrating a possible effect of behavioral norms on the macroeconomic outcome, but without any methodology for an empirical analysis. *Trust* is the only value that gained significant footing in the macroeconomic literature, using either ethno-linguistic fractionalization (assuming that fractionalized countries enjoy less trust) or a specific question regarding trust from the World Values Survey.² Zak and Knack (2001) presents a theory showing that *trust* is required in order to lower costs of investment and thus increase economic performance, and use both the WVS and fractionalization for supporting empirical analysis (see also Knack and Keefer, 1997, and Guiso, Sapienza and

² World Values Survey, the European Values Study Foundation and World Values Survey Association, 2006.

Zingales, 2004). A major problem with the usage of values is measurement, and the WVS, administering questionnaires directly asking people about some values, is no exception. The WVS did not address many values that potentially affect economic performance, and the examined values suffer from a measurement problem, due to the hesitancy of interviewees to identify their own perceived negative values.³

This research uses a novel methodology for the measurement of values, identifying the values from popular children's stories. Stories are long known to reflect the values of the society (Johns-Heine and Gerth, 1949, and Albrecht, 1956), and some claim that stories educate children, affect their moral development, and shape their values and the society's values (Vitz, 1990, and Hakemulder, 2000). Relying on either one of these two characteristics, this study uses stories collected through questionnaires to identify the values within a society in a manner that is comparable across societies. The use of stories allows us to overcome the measurement problems in surveys of values mentioned above, and allows for solving the endogeneity problem, i.e., the concern that values might be affected by economic performance, since the values are based on stories that chronologically precede the economic performance (see Guiso, Sapienza and Zingales, 2006, for a description of the problem).

We first present an abstract theory for the effect of values over economic performance. This theory illustrates the potential effects of various values on existing macroeconomic models, and thus on economic performance. We then construct a general equilibrium model demonstrating the aforementioned general theory, with the effect of a

³ Hofstede (2001) focused on work related values, but suffered from similar problems, and did not gain any influence in the macroeconomic literature. Some of the anthropology literature deals with some values of one or few societies, but this literature does not allow for comparison among a large sample of groups, and thus does not allow for any empirical analysis.

specific value that was not addressed in the economic literature so far, *responsibility and care for one's parents* (physical and financial), on the economic performance of a country or society. We show that when a country is underdeveloped, high merit placed on *care* may inhibit or prevent its development, but when a country is developed, this value has no effect. Thus, we show the importance of values for understanding the lack of development.

We later use our novel methodology for measurement of values to identify several values within the seven major tribes in Kenya. Tribes in Kenya share the same colonial history, similar geographic conditions, the same government and many other similar factors, thus making them a good test case for the theory. We used questionnaires to identify the popular children's stories in each tribe, analyzed the values each story supports and aggregated the results over the stories of each tribe. We find an extremely low level of *trust* for all the tribes (consistent with the ethno-linguistic fractionalization measurement mentioned above), and differences between the tribes in their *responsibility to other group members, attitude to hard work, risk taking, collaboration and law obedience*. We compare our results to the description of five of the seven tribes from Berg-Schlusser (1984) and find no contradictions.

The Kenyan National Bureau of Statistics does not publish data that allows for direct identification of the economic performance of each tribe, but does publish data by district (Statistical Abstract, Kenya National Bureau of Statistics, 2007). We used this data, combined with the 1999 population census (from Minnesota Population Center, 2007), relying on the geographical segregation of the tribes, to characterize the economic performance of the tribes. We found significant differences in a range of variables, and

showed the negative and significant effects of *responsibility for other group members* on the relevant variables, thus supporting our theory.

This study thus contributes to the literature in several aspects: (1) It provides a general theory for the effect of values, and a theory for the effect of a specific value, *responsibility and care for others*, on economic performance. (2) It provides a possible explanation for the failure of many development policies (see Easterly, 2007) that were based on the effect of factors such as human capital, openness to trade, and savings rate, while ignoring the effect of values. (3) It supplies a unique methodology for the measurement of values. (4) It characterizes economic performance and values of seven major tribes in Kenya.

We acknowledge some limitations of the present study: (1) The economic performance of various tribes is based on geographical segregation, which is not complete and decreases over time; and (2) having only seven tribes (i.e., seven data-points) precludes convincing empirical proof of the hypothesized effect of values on economic performance based on the proposed theory. However, we do believe that we have managed to provide support for the theory. We hope to be able to conduct a broader analysis for a large sample of countries, and to use the values from such an analysis in cross-country growth regressions, thus identifying which values affect economic performance, and through which channels.

The paper proceeds as follows: Section II presents a general theory for the effect of values. Section III demonstrates the effect of a specific value using a general equilibrium dynamic model. Section IV presents the data and empirical analysis. Section V concludes.

II. A General Theory

Most of the growth models (and some other macroeconomic models) can be written in the following general form:

$$(1) \quad Y_t = f(K_t, D_t, E_t),$$

where Y notes the output of a given country, K represents the state variables at the beginning of period t (such as the stock of capital, current technology, etc.), D represents the decisions of the various agents (such as the allocation of time between production and other activities), and E is the set of exogenous variables (such as trade policy of other countries). The state variables of the next period are affected by the decisions:

$$(2) \quad K_{t+1} = g(K_t, D_t, E_t),$$

and the decisions themselves are a function of the other variables, usually as a result of some utility maximization:

$$(3) \quad D_t = h(K_t, E_t).$$

Combining (3) and (1) yields, therefore, $Y_t = f(K_t, h(K_t, E_t), E_t) = \tilde{f}(K_t, E_t)$. Using (3), and given E of every period, one can get the evolution of the output over time.

For the Solow (1956) model, for example, the state variables are capital, size of the population, and current technology. The exogenous variables may include TFP growth rate, and the decisions of (3) are simply the constant saving rate of the economy and the constant population growth rate. Endogenous growth models (see Grossman and Helpman, 1991, for example) may include capital and knowledge (the current set of blueprints or goods) as state variables, decisions regarding time allocation between research and production, and output allocation between savings and consumption as

equation (3), and capital, knowledge and production of trading partners as exogenous variables. The same model can apply to regions, ethnic groups, etc.

Our main argument deals with the decision function and its exogenous variables. Decisions of individuals are a function of values (and combinations of values), as well as the current state and exogenous factors. The effect of risk-tolerance on decisions of individuals, for example, has long been analyzed in the microeconomic literature. One can claim that values are embedded within h , the function itself, such that every country would have a different h . However, this does not allow comparison between countries, since comparing assumes h is the same. The convergence literature (see, for example, de la Fuente, 1997) would be a good example. Therefore, (3) should actually be rewritten as:

$$(4) \quad D_t = h(K_t, M_t, E_t),$$

where M is the set of values of the population. *Risk tolerance* is widely ignored in macroeconomic models and in cross-country regressions, usually by implicitly assuming risk neutrality. Including it in a decision to become an entrepreneur in endogenous growth models (see Grossman and Helpman, 1991) would decrease the magnitude of entrepreneurial activity if the population were risk-averse. On the other hand, if *entrepreneurship* is a value by itself, i.e., the utility of an individual increases from being an entrepreneur (all else equal), the amount of this activity would increase. *Belief in just reward* may cause people to respect property rights of others, thus serving as a replacement for lack of enforcement of property rights and increasing investment and economic performance. As mentioned in the introduction, the only value that gained extensive ground in that literature is *trust*, which may affect investment decisions and the cost of transactions, thus affecting economic performance.

We claim that a wide set of values is embedded in M , affecting these decisions. The next section constructs a simple model showing that *responsibility and care for other group members*, especially for parents, can have a significant effect over economic performance.

III. Group Responsibility – Caring for One's Parents

Responsibility and care for others is regarded as a virtue, and may indeed increase the welfare of both the caregiver and the recipient. However, in some cases, it may also restrict the set of opportunities an individual can exploit, thus hurting economic performance. In this study, we address *responsibility and care for one's parents*, which can take the form of physical care and support, or a form of financial support that replaces physical support. In a less developed economy, in which the urban wage is not high enough to allow for financially supporting others (consider early stages of development), physical care for one's parents forces the individual to stay near them, in a rural area. Thus, this individual is not exposed to any employment opportunities in an industrialized-advanced sector, but rather only in the traditional sector. If the individual regards *responsibility and care* as a value, staying in the rural area increases the utility due to living by this value, and compensates for the loss of a somewhat higher urban wage. If this were the case for the entire population, the industrialized sector would face difficulties in growing and increasing its productivity. If its productivity remains low, it is unable to attract workers, thus creating a trap. On the other hand, if there exists a developed industrial sector, with high productivity and high wages, an individual may elect employment in that sector, substituting the physical care for one's parents with

financial support while still living by the same value. This substitution is not possible if the wage in that sector is not high enough. We proceed by formally modeling this mechanism.

A. *The Basic Model*

Assume an economy with two sectors: (1) traditional, which pays a wage of \underline{w} , has a constant marginal productivity which equals the wage, and is located throughout the rural area, and (2) industrial sector which pays a wage of \bar{w} , $\bar{w} \geq \underline{w}$ and is located in an urban area. For simplicity, we assume that no capital is required for production and constant marginal productivity (or a competitive market), such that there are no profits and the entire output is paid as wages. We describe the evolution of the productivity of the industrial sector over time under subsection III.C. Individuals cannot borrow or lend. We also assume that the relative price of the industrial output and traditional output is constant and normalized to 1; one may think of internationally traded goods as the reason for the constant relative price.

An individual born in the rural area chooses whether to stay near parents and work in the traditional sector, or move to an urban area and work in the industrial sector (away from parents). We assume that the utility function of a representative agent is:

$$(5) \quad U(\alpha, d, w) = V(w) - \alpha S(d) + \alpha Z(w),$$

where α , $1 \geq \alpha \geq 0$ represents the degree of importance of *responsibility and care for one's parents*, and $\alpha = 0$ represents no importance at all, d is the physical distance from the individual's parents and w is the wage. α is distributed in the population (with values between 0 and 1), we will refer to specific distribution in the following sub-sections. The individual has utility from his wage (which allows for consumption), physical presence

and physical help to one's parents (when residing near by) and financial support. We normalize the utility from financial support when the individual earns \underline{w} to 0, and treat only the increase in the utility from financial support when the wage is higher.⁴ Thus, the utility is comprised of V , a standard utility function; S , a continuous function which measures the disutility from residing far from one's parents and not being able to physically support them ($S(0) = 0, \partial S / \partial d > 0$); and Z , a continuous function which measures the increase in the utility from earning more than the rural area's wage and being able to financially support one's parents ($Z(\underline{w}) = 0, \partial Z / \partial w > 0$).^{5, 6} For simplicity, we assume that the urban area is far enough from the rural area (and the transportation system is not good enough) to make a timely 'commute' to one's parents; thus, migrating individuals cannot physically support their parents. Moreover, we assume that once the distance is above that threshold and does not allow for physical support, the actual distance has no effect on the utility. Accordingly, the distance for a migrating individual is a constant, noted with $d = \bar{d}$, compared to $d = 0$ for no migration. Thus, the utility maximization decision $\underset{d}{\text{Max}}\{V(w) - \alpha S(d) + \alpha Z(w)\}$ is simplified and translates into $\text{Max}\{V(\underline{w}) - \alpha S(0) + \alpha Z(\underline{w}), V(\bar{w}) - \alpha S(\bar{d}) + \alpha Z(\bar{w})\}$, i.e., choosing whether to migrate or not.

⁴ Obviously, adding a constant to the utility function representing this baseline utility from financial support does not change the nature of the utility function and any of the results.

⁵ Since there are no savings V can refer to w instead of to consumption, where Z is the increase in the utility from diverting a part of w from consumption to financial support.

⁶ Unlike rural-urban migration models, in which the cost of migration is either a constant or a function of the distance (see, for example, Fujita, Krugman and Venables, 1999), the cost here is affected by the value and by the interaction between the value and the alternative wage, i.e. the ability to provide financial support.

B. *Static Equilibrium*

Responsibility and care for one's parents shifts away from the industrial sector when the productivity of that sector is low, but not when productivity is high.

Claim 1: There is a cutoff level of the value (an indifference point; noted with α^*) such that individuals with a higher value would work in the traditional sector and individuals with lower value would work in the industrial sector. This cutoff level increases with the wage paid in the industrial sector.

Proof: From (5), the utility of an individual who does not migrate to an urban area is $U(\alpha, 0, \underline{w}) = V(\underline{w}) - \alpha S(0) + \alpha Z(\underline{w}) = V(\underline{w})$. The utility of an individual who migrates is $U(\alpha, \bar{d}, \bar{w}) = V(\bar{w}) - \alpha S(\bar{d}) + \alpha Z(\bar{w})$. Choosing the industrial sector requires that $V(\underline{w}) < V(\bar{w}) - \alpha S(\bar{d}) + \alpha Z(\bar{w})$, or $\alpha(S(\bar{d}) - Z(\bar{w})) < V(\bar{w}) - V(\underline{w})$. Accordingly, for every \bar{w} one can calculate a cutoff level of α , such that every individual with $\alpha < \alpha^*$ will migrate and work in the industrial sector, and every individual with $\alpha > \alpha^*$ will stay and work in the traditional sector:

$$(6) \quad \alpha^* = \begin{cases} 0 & \bar{w} = \underline{w} \\ \frac{V(\bar{w}) - V(\underline{w})}{S(\bar{d}) - Z(\bar{w})} & 1 > \frac{V(\bar{w}) - V(\underline{w})}{S(\bar{d}) - Z(\bar{w})} > 0 \\ 1 & \text{otherwise} \end{cases}$$

Note that (6) is increasing in \bar{w} (and strictly increasing in \bar{w} when $1 > \alpha^* > 0$), i.e., when the wage in the industrial sector is higher, the level of *care for parents* required to prevent someone from migrating is higher. QED

Let us consider two possible distributions of α in the population (while maintaining the assumption that $1 \geq \alpha \geq 0$); the first is very general and embodies many possible distributions, and the second complies to the analysis of a representative agent.

The first case is a distribution which is continuous with a strictly increasing cumulative distribution function (i.e., strictly positive density function, such as the uniform distribution). In this case, an increase in productivity and wage of the industrial sector raises α^* and raises the share of population that is employed in the industrial sector (strictly raises as long as $1 > \alpha^*$).

The second case is the trivial distribution of one-mass-point density function, i.e., all of the population has the same level of the value, noted with $\hat{\alpha}$ (one-point-distribution hereinafter). As long as $\alpha^* < \hat{\alpha}$ the industrial sector does not exist. An increase in the wage of that sector increases α^* . If it increases such that $\alpha^* > \hat{\alpha}$, the entire population shifts to the industrial sector.

Let us note with $P(x)$ the portion of the population which has a value of $\alpha \leq x$. It is easy to see from the above analysis, by observing $P(\alpha^*)$, that since P is increasing in x , and since α^* is increasing in \bar{w} , $P(\alpha^*)$ is increasing in \bar{w} .

Let us now compare two countries identical in all parameters except the distribution of the *responsibility and care* value. Define a country with a lower level of values as a country that has greater P for every $x < 1$ (i.e., country 1 has a lower level of care than country 2 if and only if $\forall x < 1, P_1(x) > P_2(x)$).

Claim 2: All else equal, a country with a lower level of *responsibility and care* has a larger population share employed in the industrial sector.

Proof: Easy to see, by substituting x with α^* , that for every \bar{w} and the matching α^* , a country with a lower level of the value has a greater $P(\alpha^*)$ (directly from the definition)

and therefore a larger share of the population employed in the industrial sector (strictly larger share for $1 > \alpha^* > 0$). QED

Note that the economy is in general equilibrium: Workers choose their sector, are paid their marginal productivity, and the workers and their parents consume their income. Since the two goods have relative price of 1, and since the entire output is paid as wages (no capital, constant marginal productivity), the economy is in general equilibrium.

C. *Dynamic Effects*

The productivity of the industrial sector and the wage this sector pays may increase over time, as a result of improvement in technology, learning how to better produce, etc., but only if this sector exists. We use the Learning by Doing mechanism (first appeared in Arrow (1962) and later, in different versions, in Romer (1986), Young (1991), Aharonovitz (2008) and others) and apply a bounded learning mechanism:

$$(7) \quad \bar{w}_t = A(P_{t-1}),$$

where A is a continuous (and differentiable) function, $A(0) \geq \underline{w}$, $\frac{\partial A}{\partial P} > 0$. The productivity, and therefore the wage paid by the industrial sector, is increasing with past employment in this sector, since greater employment in the past allowed for more learning experience and improvements in production. However, if the sector did not exist, we assume that its productivity is identical to that of the traditional sector or above it.⁷

Let us first observe the case of one-point-distribution with low productivity of the industrial sector when it didn't exist the period before (where the extreme case is $A(0) = \underline{w}$), but high if the entire population works in that sector. Let us note the wage of

⁷ This is a bounded mechanism, which does not allow for perpetual growth. One may regard it as a catch-up mechanism (where $A(1)$ represents catch-up) with the advanced technology developed elsewhere.

the industrial sector required to push the population towards that sector with \bar{w}^* (i.e., $\alpha^*(\bar{w}^*) = \hat{\alpha}$).

Claim 3: If the distribution of values in the population is one-point-distribution, $A(0) < \bar{w}^*$ and $A(1) > \bar{w}^*$, there exists a poverty trap.

Proof: Let us check the two extreme points. Assume that $P_{t-1} = 0$, i.e., no-one was employed in the industrial sector. Accordingly, $A(P_{t-1}) < \bar{w}^*$, therefore $\alpha^*(A(P_{t-1})) < \hat{\alpha}$, and $P_t = 0$. Note that the inequalities hold for every P_{t-1} , which is close enough to 0. Therefore, if the share of the population employed in the industrial sector was low enough, the share in the following period is 0.

Assume now that $P_{t-1} = 1$ (i.e., the entire population was employed in the industrial sector). Accordingly, $A(P_{t-1}) > \bar{w}^*$, therefore $\alpha^*(A(P_{t-1})) > \hat{\alpha}$, and $P_t = 1$. Note that the inequalities hold for every P_{t-1} which is close enough to 1. Therefore, if the share of the population employed in the industrial sector is high enough, the entire population works in the industrial sector in the following period. The wage and the utility are obviously higher than the first case presented ($P_{t-1} = 0$), therefore, the first case is a poverty trap.⁸ QED

Notice that, for a given learning function $A()$, the existence of the trap depends on the distribution of the value in the population. If the density mass of value $\hat{\alpha}$ generates P , such that the industrial sector required to attract them is low enough (i.e. $A(0) > \bar{w}^*$ and therefore $\alpha^*(A(0)) > \hat{\alpha}$), the trap disappears. Therefore, the existence of the trap depends

⁸ The result resembles the big-push argument (see, for example, Murphy, Shleifer and Vishny, 1989), but the increase in productivity here is required in order to overcome a cutoff level of the value rather than in order to create a market-size effect.

on the distribution of the value and, if the *responsibility and care* value in the population is low enough, the trap may not exist.

Panel A of Figure 1 presents the trap. The curved solid line is current industrial wage (vertical axis) as a function of past employment in that sector (P_{t-1} , horizontal axis). The two solid vertical lines represent P_{t-1} (horizontal axis) as a function of the wage at that period, w_{t-1} (the vertical axis, which is used for both past and current wage). As long as the wage is below \bar{w}^* no one works in the industrial sector ($P_{t-1} = 0$) and, accordingly, the wage remains below \bar{w}^* . However, if the wage is above \bar{w}^* , everyone works in the industrial sector, thus causing the wage to stay above \bar{w}^* . Therefore, a wage below \bar{w}^* is indeed a trap. Panel B presents the case of no trap – the wage of the industrial sector is above the cutoff (indifference) wage for every P , thus attracting the entire population to the industrial sector.

Figure 1 here

When the distribution of the *responsibility and care* value in the population is not one-point-distribution, one gets $P(\alpha^*)$ which is increasing in \bar{w} (see subsection III.B), but the exact shape of the function depends on the distribution of that value and the functional forms. For some distributions and functional forms one can get poverty traps, while for others the result may be multiple equilibria or solely complete industrialization. Figure 2 demonstrates this by presenting several possible P functions. While, for the lower dashed line, the only equilibrium is complete industrialization (for every P , the wage of the industrial sector is higher than the wage required to support this level of P , therefore P increases over time), for the upper dashed line the employment is solely in the

traditional sector. The middle one presents multiple equilibria, stable and unstable. One can easily notice that the possible equilibria are a function of the distribution of the value and the learning function A .

Figure 2 here

The model presented in this section creates a similar pattern to the one described under Section II. The output is a function of current productivity and the individuals' decisions regarding choice of sectors. The productivity is a function of past productivity, and the decisions are a function of the productivity and the values (similar to equation (4)). A population that is characterized by a high level of the value may tend to decide not to migrate, but rather to stay close to the family and work in the traditional sector, thus preventing future growth. Thus, the model serves as an example of that general theory. The following sections present data supporting this model.

IV. Data and Empirical Analysis

Tribes in Kenya demonstrate differences in values and in their economic performance. Since the tribes share the same colonial origin, the same government, and many other factors that affect economic performance, they are a good test case for analysis of the effect of values on economic performance. We selected therefore the seven major tribes in Kenya: Kikuyu, Luo, Luhya, Kamba, Kalenjin, Kisii, and Meru, who represent more than 80% of the population (all tribes that are above 5% of the population; Kenya has more than 50 tribes, but each of the other tribes represents significantly less than 5%; see Kurian, 1992a). We gathered data on the values and economic performance of these tribes and analyzed the link between the two.

A. *Economic performance*

The Kenyan government does not publish data on economic performance by ethnicity, and omits this variable from the population survey. However, data by geographical location (districts) combined with the geographical segregation of the tribes allowed for constructing the economic performance indicators of the tribes. We used the 2007 Statistical Abstract (Kenya National Bureau of Statistics, 2007) and Kenya 1999 Population and Housing Census (Minnesota Population Center, 2007) to extract data for several variables representing economic performance by district. We matched a map of the districts (Kenya National Bureau of Statistics, 2007) to maps of the languages and tribes in Kenya (Gordon, 2005, served as the baseline map; Kurian, 1992b, was used as well) to determine which tribe is the major occupant of which district. For each tribe, we constructed economic performance indicators as a weighted average (by population size) of these indicators over the districts occupied by that tribe.⁹ Table 1 presents the tribes, districts occupied by each tribe, and the economic performance variables we selected.

Table 1 here

The economic performance variables chosen include: (1) infant mortality rate (representing health conditions); (2) share of the population with at least primary education (since education is strongly correlated with higher wages, at least in developed countries; see, for example, Becker, 1964); (3) share of households with three or less people (allowing for higher investment in human capital); (4) share of employment outside the family (representing more non-traditional economic activity); (5) average of the share of households with electricity, share of households with piped water, and share of households with sewage access (representing modern housing conditions and

⁹ Districts populated by more than one major tribe were dropped from the sample.

urbanization, which are associated with economic development); and (6) households' share with roof made of tiles, concrete or sheet metal (again, representing better standards of living and urbanization, thus development). However, since Kenya is relatively underdeveloped, health conditions may be influenced by external aid, thus not always representing development. In addition, since the return to human capital is lower in less developed places, there are fewer opportunities for taking advantage of better education, thus making the second and third variables good indicators for potential future development, but not necessarily for current development. External employment in Kenya is affected by ownership of land and inheritance rules affecting this ownership, which vary by tribe (Berg-Schlosser, 1984). Therefore, our leading variables in the analysis are the last two, (5) and (6). These two variables, which are strongly correlated, measure current development and therefore should be strongly associated with the evolution of wages and output discussed in section III. It should be noted that the income, output per capita or average wage per district (or tribe) would have been better variables, but this data is unavailable for many of the districts and for a large share of the population in the other districts.

Table 1 presents all six indicators. Note the significant differences between the tribes and the correlation across some of the indices. The Kikuyu, the tribe with the lowest infant mortality rate, also has the highest education, highest share of small families (family size), highest external employment, and highest share of modern housing conditions. These findings are in line with Berg-Schlosser (1984), reporting that the Kikuyu have the highest percentage of non-agricultural employment among all tribes, the highest percentage of people with formal education, and a tendency to build modern

houses. The Meru, with the second lowest mortality rate, also enjoy high shares of modern housing conditions.

The Luo and the Luhya, with the highest mortality rates, are also below average on education, external employment, and modern housing conditions among the seven tribes. While Berg-Schlosser (1984) indicates that the Kamba and the Luhya are second to the Kikuyu in education, we found them slightly below average. This may be a result of Berg-Schlosser (1984) not reporting findings for the Kisii, who we found to be more educated than the Luhya. Our findings that the Luhya and Luo are below average in modern housing conditions are in line with Berg-Schlosser (1984), describing lack of modernization for the two tribes and high fertility rate for the Luhya, leading to poverty.

The differences between the tribes in economic performance indicators are of a large magnitude – mortality rate of 126 for every 1000 infants for the Luo, compared to 35 out of 1000 for the Kikuyu, difference of a similar magnitude in the share of households with electricity/piped water/sewage, and significant differences in other variables as well. Again, our two leading variables are the modern housing variables.

B. Values

The tribes in Kenya and the values of some of these tribes were researched before (see, for example, Berg-Schlosser, 1984), but not quantitatively and not consistently for a large set of tribes and a large set of values, which would enable analysis of the effect over economic performance. Since stories reflect the values of the society (Johns-Heine and Gerth, 1949, and Albrecht, 1956) and shape the values of the younger members of the society (Vitz, 1990, and Hakemulder, 2000), we have used children's stories to infer the values.

We interviewed respondents from each of the seven tribes (mostly by telephone), asking them to name and narrate popular children stories, ultimately collecting about 190 popular stories. Each story was analyzed for 12 values (*hard work, entrepreneurship, risk taking, collaboration, leading others, altruism, integrity, trust, responsibility to other group members, law obedience, just reward and justice/morality*), with a score of -1 for opposing the value, 1 for some support, and 2 for a strong support. For each tribe, the 12 values were constructed as the average over the score of each of its stories. See Appendix 1 for a list of the questions used for scoring. In addition, we measured how many of the stories involve *death* or *cruelty*.

Out of the above mentioned values, three values were addressed in two or fewer stories for almost all the tribes. Thus, *entrepreneurship, leading others* and *justice/morality* are neither supported nor opposed in the stories. While this may reflect on the economic performance of Kenya as a whole, it does not allow us to distinguish between tribes, and therefore these values were omitted from the analysis. More than 40% of the stories involve *death/cruelty*, but with little variation; therefore, for a similar reason, we did not address it in the analysis.

We grouped similar values (*collaboration* and *altruism* as measuring cooperation within a group, *integrity and trust* since the first may lead to the second, and *law obedience* and *just reward*, which are related to one another), leading to the following results:¹⁰

Figure 3 here

¹⁰ *Risk taking* is addressed by only 3 stories for some of the tribes, the rest of the values are addressed by 5 or more stories in each tribe.

Figure 3 shows differences between the tribes for each value, and differences between the average levels of various values. The Kalenjin stand out as *collaborating*, *responsible to group members* and *law obeying*.¹¹ The Kamba stand out as *hard working*. The Kikuyu show the highest level of *risk taking* and the lowest level of *hard work*, *trust*, *responsibility to group members* and *law obedience*.¹² The Kisii are avoiding *risks* and *collaboration*. The Luhya show a high level of *collaboration*.¹³

Hard work and *responsibility to others* are generally supported. *Law obedience* is positive but very low. *Collaboration* is mixed. *Risk-taking* and *integrity and trust* are opposed in the stories, with *trust* itself gaining values of -1 to -0.7 for all the tribes. This extremely low level is in line with measuring *trust* using ethno-linguistic fractionalization, thus supporting our measurement methodology.

Responsibility to group members, the value addressed in section III, has an upper bound of 1.2 (for the Kalenjin and Kisii), relatively high level for the Kamba and Luhya (1.0 each), a level of 0.8 for the Luo, and lower levels for the Meru and Kikuyu (0.3 and 0.1 respectively). It is addressed by 69 stories in the sample.

C. Correlations

Table 2 presents the correlations between the economic performance indicators and each of the values from the previous sub-section (where the data includes the indicators and values for each of the tribes):

¹¹ Our findings are in line with Berg-Schlosser, 1984, indicating that the Kalenjin's conduct is governed by respect towards others, in particular family and elders, and that they trust one another but are suspicious toward strangers.

¹² This is broadly in line with Berg-Schlosser, 1984, describing the Kikuyu as having suspicious behavior toward others and among themselves, with trust confined to one's family and age-set, and as having a high number of thieves and robbers. Although Berg-Schlosser describes strong relations with other group members, this description appears for all the surveyed tribes, thus not allowing for comparison.

¹³ Berg-Schlosser, 1984, indicates that the Luhya are generally regarded as friendly and peaceful, and are said to have strong feeling of kinship concerning their clans and sub-tribes.

Table 2 here

It should be mentioned that although the table presents correlations, causality can run in only one direction. The economic performance variables are from the last decade, while the stories on which the values are based are much older. Since the stories and values predate the economic indicators, causality can run from the values to economic performance, but economic performance is not causal to the values.

Our focus here and in the next sub-section is on *responsibility to group members* and its effect over economic performance, mainly through the modern housing indicators. *Responsibility* is positively correlated with mortality and negatively correlated with indices of economic performance (education, small family, external employment, and modern housing). Correlations with the modern housing indicators are -0.89 and -0.82. Thus, *responsibility to group members* is strongly negatively correlated with current development, and negatively correlated with future development through both current development and education. Section III provided theoretical support for this effect. The next sub-section presents regression analysis for *responsibility*, while the rest of this sub-section refers to the other values.

Hard work is positively correlated with infant mortality and negatively correlated with the rest of the variables, i.e., negatively correlated with better economic performance. A possible interpretation is that *hard work* supports traditional agricultural work and manual labor, thus treating innovation as an unwelcomed short-cut. *Risk taking*, on the other hand, is negatively correlated with infant mortality and positively correlated with the rest of our indicators. Our interpretation is similar to the previous one – *taking risks* allows for abandoning the traditional way of living for a modern one, thus allows

for modernization, better standards of living and better health care. *Collaboration* and *integrity and trust* are also positively correlated with mortality and overall negatively correlated with our education and development indices. Keeping in mind that the level of *integrity and trust* is very low (the values are opposed in the stories), a possible interpretation is that, in an environment of distrust, trusting or collaborating lead to an inferior result. This may also explain the overall negative correlation of *law obedience* with economic performance.

D. Regression Analysis

Based on the theory presented under section III, we continue with analysis of the effect of responsibility over economic performance indicators, using our two leading indicators (modern housing conditions):

$$\text{housing conditions} = \alpha_0 + \alpha_1 \times \text{responsibility} + \varepsilon$$

Since we have only seven observations (one for each tribe) we must restrict our regressions to one explanatory variable. We are aware of the problems in using regression analysis with so few observations and regard the results as support for the theory, not proof. Table 3 describes the results:

Table 3 here

For the two regressions, the constant is positive and significant. The coefficient of *responsibility for other group members* is negative and significant in both regressions, such that every increase of 1 in the *responsibility* level decreases the average of electricity/piped water/sewage by 13.38 percent points and the average of house roof by 30.96 percent points. Thus, *responsibility to others* reduces modern housing conditions, therefore negatively affecting development of that group.

As mentioned before, causalities issues and endogeneity problems of values and economic indicators (see Guiso, Sapienza and Zingales, 2006) are not present here. Values were measured using stories that are significantly older than the economic indicators, therefore *responsibility* can be causal to economic performance, but economic performance of the last decade cannot be causal to our measure of *responsibility*. The regressions, therefore, support the theory from section III.

V. Conclusion

This research emphasizes the importance of the individual's values to economic performance. We have presented a general model showing that values should be embedded into macroeconomic models, and provided an example for *responsibility and care for other group members* using a specific model. We showed that *responsibility and care*, although considered as a virtue, might slow or prevent development. Thus, a small difference in the values of two societies may translate over time into a large gap in their economic development.

A major contribution of this paper is suggesting a methodology for the measurement of values for economic research, overcoming both the problem in directly asking people about values and the problem of endogeneity between values and economic performance, by inferring them from already existing popular stories. We used it to measure and characterize values of the seven largest tribes in Kenya, analyzed the economic performance of these tribes with respect to the values, and showed that, indeed, *responsibility and care for others* might negatively affect economic development. Our

seven tribe sample is small and therefore supports the theory and motivates further research of values, but it cannot serve as proof.

Differences in values call for different economic policies. Consider, for example, levying a tax and using it for a social safety net. If a country is underdeveloped due to *responsibility and care* as presented above, the safety net can replace the physical care, motivate individuals to migrate to the industrial sector, and improve the economic performance over time. However, if *responsibility and care* are not the reasons, the safety net is unhelpful, while the tax levied to finance it is harmful. Moreover, if the reason for underdevelopment is *lack of entrepreneurship*, for example, and the tax is progressive, i.e., levied on financially successful workers and entrepreneurs, it would deter entrepreneurship even more, and therefore would hurt economic development. Thus, development policy is not 'one size fits all' and should be tailored to each country based on its unique characteristics, including its values.

The macroeconomic literature avoided treating values for a long time, probably due to the abstract nature of this topic. However, we do believe that, after exploiting many other possible explanations for differences in economic performance with only partial success in improving economic performance in various locations, differences in norms and values should be explored as well. We hope our research will contribute to broader study of values and their effects, and eventually to understanding the origin of the differences in economic performance and the path for improving economic performance of less developed countries. Measuring a broad set of values in a large group of countries and using it in a cross-country regression seems like a promising next step.

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Figure 1 - Evolvement of Wages and Employment in the Industrial Sector
 One Mass-Point Distribution

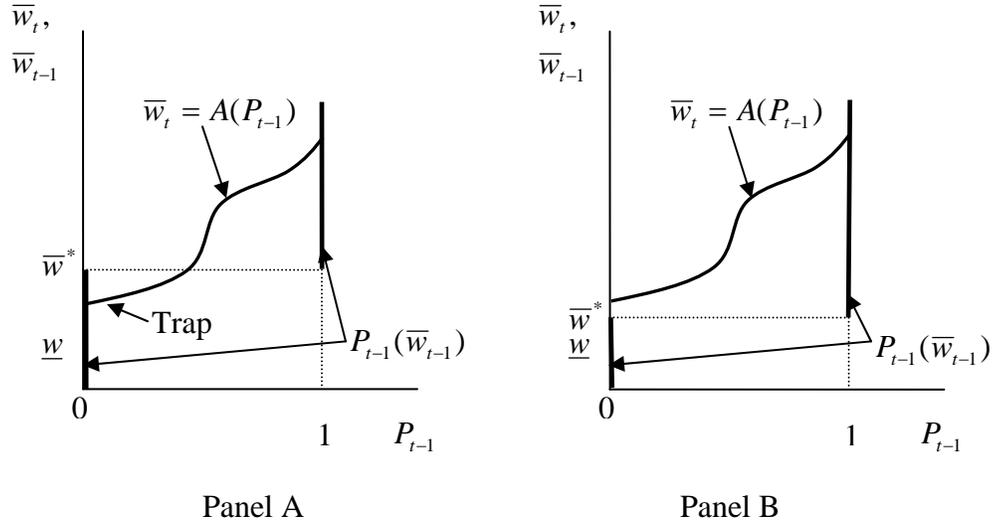


Figure 2 - Evolvement of Wages and Employment in the Industrial Sector

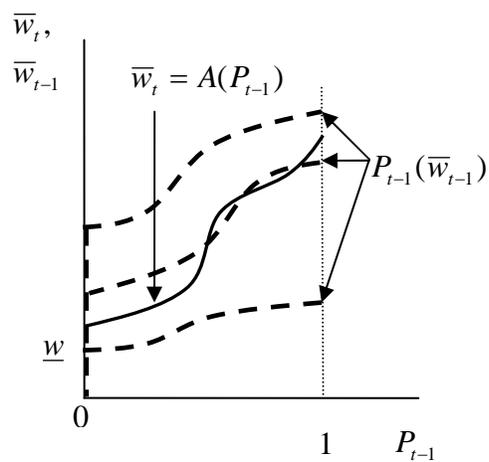
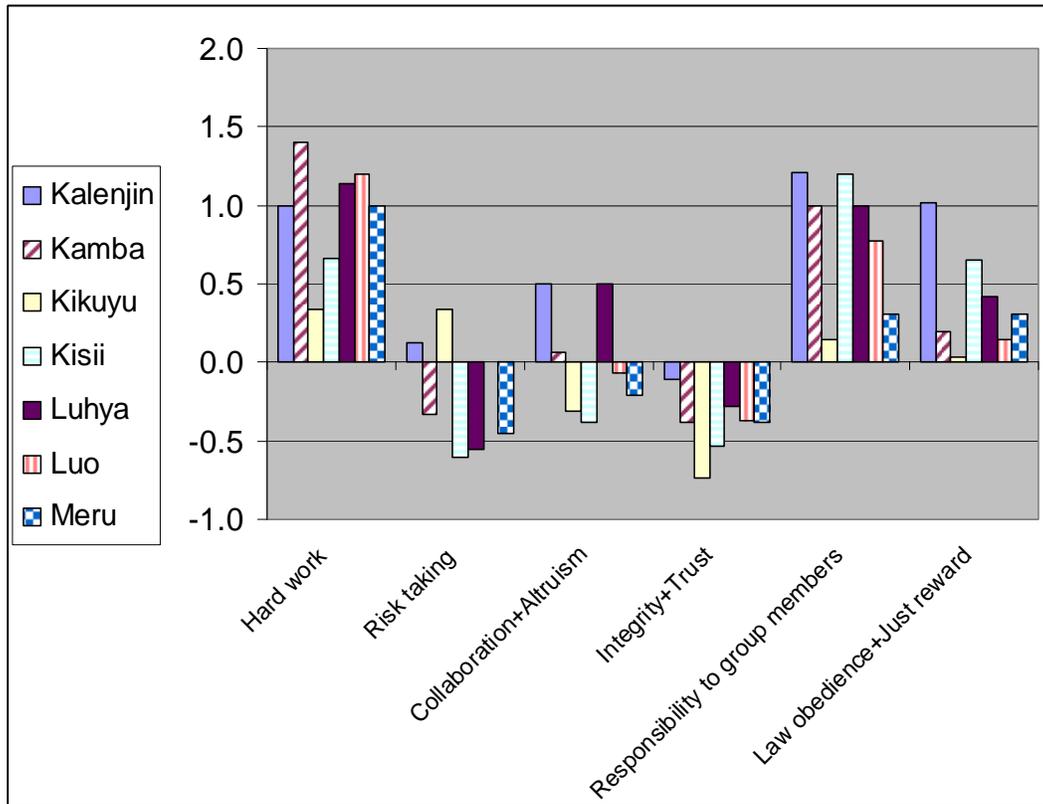


Figure 3 – Values of Tribes in Kenya*



* 2 - strong support; 1 – some support; 0 – no support; -1 opposing the value.

Table 1 – Economic Performance Indicators for Tribes in Kenya

Tribe	Districts	Infant Mortality Rate (per 1000 live births, 2007)	Education (% of population with primary and above education, 1999)	Family Size (% of population with 1-3 members, 1999)	External Employment (% of population employed outside the family, 1999)	Electricity, Piped Water and Sewage (average % of households with access to, 1999)	House Roof (% of population with sheet metal, tiles or concrete roof, 1999)
Kalenjin	Baringo, Bomet, Buret, Keiyo, Kericho, Koibatek, Marakwet, Nandi, West Pokot, Uasin Gishu	53.0	51.1	32.5	33.5	11.0	58.7
Kamba	Kitui, Machakos, Makueni, Mwingi	55.9	54.9	31.0	29.1	8.3	67.4
Kikuyu	Nyandarua, Nyeri, Kirinyaga, Maragua, Murang'a, Thika, Kiambu	35.0	71.4	45.9	38.8	20.1	95.9
Kisii	Kisii South (Gucha), Kisii North (Nyamira), Kisii Central	61.2	58.0	27.9	21.5	4.4	69.8
Luhya	Bungoma, Busia, Kakamega, Butere-Mumias, Vihiga, Lugari	104.9	54.6	33.4	24.1	5.7	57.3
Luo	Bondo, Nyando, Rachuonyo, Siaya, Homa Bay, Migori, Kisumu	125.8	52.9	40.8	23.8	8.4	54.3
Meru	Meru Central, Meru North (Nyambene), Nithi (Meru South)	46.1	50.6	37.9	24.5	19.8	88.4

Table 2 – Correlations between Economic Performance and Values*

Economic performance	Infant Mortality Rate	Education	Family Size	External Employment	Electricity, Piped Water and Sewage	House Roof
Value	(per 1000 live births)	(% of population with primary and above education)	(% of population with 1-3 members)	(% of population employed outside the family)	(average % of households with access to)	(% of population with sheet metal, tiles or concrete roof)
Hard work	0.51	-0.79	-0.40	-0.45	-0.45	-0.67
Risk taking	-0.19	0.47	0.69	0.84	0.50	0.21
Collaboration + Altruism	0.33	-0.47	-0.29	0.08	-0.35	-0.65
Integrity + Trust	0.33	-0.86	-0.48	-0.24	-0.38	-0.73
Responsibility to group	0.32	-0.51	-0.86	-0.39	-0.89	-0.82
Law obedience + Just reward	-0.13	-0.46	-0.65	-0.08	-0.36	-0.42

* Correlations are for 7 observations (7 tribes). Numbers is bold are above 0.5 or below -0.5 .

Table 3 – OLS Regression for Economic Performance and Responsibility*

	(1)	(2)
Dependent variable	Average Electricity, Piped Water and Sewage	House Roof
Responsibility	-13.38 (4.32) ^{***}	-30.96 (3.16) ^{**}
Constant	21.89 (7.87) ^{***}	95.23 (10.85) ^{***}
Adjusted R square	0.75	0.60

* Numbers in parentheses are the absolute values of the t-statistics.

** Significant at 2.5% level.

*** Significant at 1% level.

Value	Identifying Question*
Hard work	Does the story advocate <i>hard work</i> ? Or – just the opposite (the story advocates being lazy)
Entrepreneurship	Does the story promote <i>entrepreneurship, initiating new activities etc.?</i> Or - just the opposite (the story discourages entrepreneurship and new initiatives).
Risk taking	Does the story encourage <i>taking risks</i> ? Or - just the opposite (the story encourages avoiding risks).
Collaboration	Does the story promote <i>collaboration</i> with others? Or - just the opposite (the story promotes individualism and working on one's own).
Leading others	Does the story encourage <i>leading others</i> ? Or - just the opposite (the story encourages avoiding being a leader).
Altruism	Does the story advocate <i>good will, altruism, helping others without receiving immediate benefit or preferring someone else's needs over one's own?</i> Or - just the opposite (the story advocates selfish behavior or discourages altruism).
Integrity	Does the story promote <i>integrity, telling the truth and being honest in dealing with others?</i> Or - just the opposite (the story promotes lying and being dishonest).
Trust	Does the story encourage <i>trusting others</i> ? Or - just the opposite (the story encourages suspicious and careful behavior towards others).
Responsibility to other group members	Does the story promote being <i>responsible and caring to other group members, or doing what others are expecting us to do?</i> Or - just the opposite (the story promotes rebelling in one's community or society).
Law obedience	Does the story encourage <i>obeying the law and respecting the rules?</i> Or - just the opposite (the story encourages cheating, stealing or other unlawful behavior, semi-illegal or illegal activities).
Just reward	Does the story advocate <i>just reward - reward for good deeds or punishment for bad deeds?</i> Or - just the opposite (the story shows that bad deeds may get a reward while good deeds may bring upon a punishment).
Justice\morality	Does the story encourage <i>justice and being just and moral?</i> Or - just the opposite (the story encourages unjust behavior).

*Answers included yes-definitely, yes-somewhat, no, just the opposite or N\A.