

Human Development and Electoral Systems*

Abstract

The aim of this paper is to test if electoral systems and human development are linked. Using high quality data and very simple panel data econometric techniques, we show that electoral systems play a critical role in explaining the difference in the levels of human development between countries. We find that countries which have proportional systems enjoy higher levels of human development than those with majoritarian ones, thanks to more redistributive fiscal policies. We also find that when the degree of proportionality, based on electoral district size, increases, so does human development.

Keywords: Political Economy, Electoral Systems, Human Development, Public Spending, Public Choice

JEL Classification: I32, H53, D72

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1. Introduction

The concept of human development is much wider than that of poverty which is directly related to income. It is based on the assumption that living a long and healthy life, with full access to education, is an indispensable complement to financial well-being. In addition, it also involves the recognition of the importance of economic, political and social liberties. Scholars have been interested in the latter concept since the *basic needs* approach was developed by the World Bank and the International Labour Organisation (ILO). Sen (1990), using a slightly different approach, gave a new impetus to the study of welfare by considering the importance of individual capacity, focusing on what a person really does as opposed to what he could do, given his idiosyncrasies. As a result, in recent studies, welfare concepts are often privileged over that of poverty. The literature is also reaching a point where it is generally accepted that the success of a society should be measured by how economic goals are translated into practical opportunities for the people, more than just some global growth rate of per capita income.

The role of government spending in improving human development has been considered by many authors (among others let us mention Strauss and Thomas, 1995). What generally emerges is that redistributive expenditures, such as social security and welfare spending, are efficient in the human development improvement strategy, while local public goods (such as pork barrel) have a very poor poverty reduction effect (Ranis and Stewart, 2000). What we want to show in this paper is that electoral systems influence the level of human development, through their effect on the breakdown of government spending: depending on the existing electoral system, politicians will choose the type of public expenditures they implement in function of the key groups of voters they want to target to maximize their

probability of being reelected. Indeed, reelection is strongly dependent on the rules of the system, which politicians know perfectly well, and that define which electors they should try to attract.

Persson and Tabellini (1999, 2000) show, in the context of a Downsian model of electoral competition, that in larger districts, electoral competition will be diffused since parties will seek support from broad coalitions of voters. On the contrary, in smaller districts, competition will be concentrated in locally geographically determined constituencies, towards which spending will be oriented. Under proportional representation (characterized by large electoral districts¹), politicians will favor broad redistributive policies, while under a majoritarian rule, they will favor local public goods spending. A similar conclusion is reached in Milesi-Ferretti, Perotti and Rostagno (2002). Extending the strategic delegation model of Chari, Jones and Marimon (1997), they show that in large electoral districts, legislators represent nationwide distributed socio-economic groups, targeting expenditures towards them. In small districts they represent locally determined groups and prefer to target expenditures locally. In addition, in single member districts, the objective is to win 50% of the votes² in 50% of the districts. On the other hand, under full proportional representation, a coalition of parties needs to win approximately 50% of the national vote, leading politicians to internalize the benefit for a larger share of the population. As shown by Lizzeri and Persico (2001), this will end in more redistributive programs in proportional representation and more local public good expenditures in majoritarian systems. Given that several authors have proved the positive effect of redistributive spending on human

¹ Note that the size of a district is defined here as the average number of politicians elected in electoral districts.

² Or even less in the case of pure plurality systems .

development, we expect proportional representation systems to be associated with higher levels of human development than majoritarian ones.

The structure of this paper is the following: after this short introduction, in the second section we briefly review the literature linking electoral systems and human development; in the third we present the methodology and the data we use and in the fourth we comment our main results. Finally, in the fifth section we conclude.

2. Electoral Systems and Human Development

Several authors have tried to identify which factors play an important role in explaining the differences in the level of human development between countries. Ramírez, Ranis, and Stewart (1999), show that economic growth is one of the most important features. Fields (1989), Deininger and Squire (1996) and Bruno et al. (1995) arrive at similar conclusions, adding that the reduction of poverty and human underdevelopment is dramatically linked to the level of income inequality. Lipton (1977), Ranis (1979) and Stewart (1977) show that the type of economic growth is important as well, since a growth process associated with unemployment reduction and increasing rural income is much more efficient to reduce poverty than a growth process based on intensive capital and urban development. As far as government spending is concerned, Strauss and Thomas (1995), show how government spending on social security³ and welfare affects human development positively using recently available micro-level data. It is thus extremely important to understand which

³ in the broad sense, i.e. also linked to health and education.

factors determine the breakdown of government expenditures in order to be able to enforce clear poverty reduction strategies. Our idea is that electoral systems have an effect on social security and welfare expenditures and thus on human development. The effect of electoral systems on redistributive spending has been analyzed by several authors. Persson and Tabellini (1999), in a two-party electoral system model, show that small electoral districts (typical of majoritarian systems) are associated with locally targeted expenditures since political competition is concentrated in geographically determined constituencies (districts) while large districts (typical of proportional systems) are associated with broad redistributive spending since parties seek the support of a wide coalition of voters. Milesi-Ferretti et al. (2002) arrive at similar conclusions but with a different type of modeling. Starting from the assumption that elected politicians represent a specific locally determined group in small constituencies, while in large districts they represent large socio-economic groups, they show that in countries characterized by a majoritarian electoral rule and by many small electoral districts, public expenditures will mainly be composed of local public goods, while in proportional systems, with few large districts, they will be composed mainly of redistributive spending. Finally, in single member districts, the objective is to win 50% of the votes⁴ in 50% of the districts i.e. around 25% of the total vote may be sufficient, while under full proportional representation, some coalition of parties needs to win approximately 50% of the national vote, leading politicians to internalize the benefit for a larger share of the population. As shown by Lizzeri and Persico (2001), this will result in more redistributive programs in proportional representation systems and more local public good expenditures in majoritarian ones. Given that local public goods such as pork barrel are not redistributive by nature, Verardi (2003) and Roland and Verardi (2005) suggest that

⁴ or even less in the case of pure plurality systems .

proportional systems should be associated with lower levels of income inequality. Austen-Smith (2002), considering a model with an exogenous political structure, arrives at a similar conclusion. He shows that proportional systems are associated with more redistributive taxes than typical two-party majoritarian systems, implying less income inequality. A similar reasoning can be adopted here: given that proportional systems are associated with more redistributive spending and given that Strauss and Thomas (1995) have shown that redistributive spending reduces human underdevelopment, we expect proportional systems to be associated with higher levels of human development than majoritarian ones. The scope of this paper is to test for this hypothesis. Before presenting the results in detail, it is important to clearly define our methodology and the data used. The following section does this after presenting some stylized facts.

3. Data and Methodology

A simple descriptive analysis is the first necessary step to test for a relation between human development, social security spending and electoral systems. Table I, which presents the average human development index and the average level of social security spending per year and by system, can help to see if proportional democracies are systematically associated with higher levels of human development and redistributive expenditures. Note that for this simple analysis, we decided to code a system as proportional if at least half of the representatives are elected by a proportional rule, and majoritarian otherwise. We will refine this naive measure further on. Social security spending is given as a percentage of GDP, as suggested by Persson and Tabellini (1999).

[INSERT TABLE I HERE]

From Table I we see that for all the years considered, both the levels of social security expenditures and human development are higher in proportional systems than in

majoritarian ones⁵. It is quite interesting to graph these features to get a better idea of the relation between the variables. This is done in figure 1, in which the human development indicator is on the vertical axis and social security spending is on the horizontal axis. The variables are presented for all the available years. As the type of electoral system is the main focus of our analysis, each observation is labeled with either *prop* (if the electoral system of the country corresponding to the observation is proportional) or *maj* (if it is majoritarian).

[INSERT FIGURE 1 HERE]

The picture given by this figure is striking. First we see that a majority of the observations to the left of the figure correspond to majoritarian systems, while on the right they are mainly proportional. Furthermore, there is clearly a concave increasing relation between social security spending and human development. More precisely, it appears that, for these data, a logarithmic fit is probably much more appropriate than a linear one. These findings are interesting, but they are of course not sufficient to conclude anything and a much deeper analysis is needed. A first thing to do then, is to take a more precise measure of the degree of proportionality of a system than a simple dummy variable. Second, we need to consider control variables to avoid the omitted variable bias. Third, we need to work with a system of equations to test for both predicted effects simultaneously. Fourth, we should consider other dependent variables related to human development to see if our results stand. Finally, since the available data are not balanced between countries, we need to check if the results are not affected by awarding the same weight to all the data. We now turn to a detailed description of the data and of our general methodology.

⁵ Note that when we perform a test of comparison of means, we never reject the hypothesis that both variables are higher in proportional systems with respect to majoritarian systems (at a 5% confidence level).

As stated previously, our data have a panel structure. Given that we want to see the effect of electoral systems on human development through redistributive fiscal spending, we propose to use a two-stage least-squares methodology, correcting the standard errors for groupwise heteroskedasticity. Since the electoral variable we are interested in hardly changes over time, a fixed-effect regression is not suitable here. A random effect estimator would be of no use either, since our individuals are countries and it is difficult to believe in strict independence between exogenous variables and the permanent component of the error term. A between estimator is not suited either since some dummy variables change over time, and the period of observation differs a lot between countries⁶. We must therefore use a pooled clustered regression.

The cluster option is considered to control for the fact that observations are independent across countries, but not within countries. Given that the panel is unbalanced and we have no way of testing if the unobserved data are randomly missing, it might be argued that we award more importance to some countries than to others. As a robustness test, we decided to compare our results with a weighted regression where all observations are given the same importance. We arrived at similar conclusions.

To test if electoral systems affect human development through transfer expenditures, the specification is rather easy. We should first check if electoral systems really affect transfer expenditures unequally, and then check if we find that higher transfer expenditures imply higher levels human development. Formally this can be done by running a system of equations of the type:

⁶ In particular, dummy variables identifying slight modifications in the definition of the indicator.

$$\begin{cases} TR_{it} = \mathbf{h} + \mathbf{b}_{11}Z_{it} + \mathbf{b}_{12}G_{it} + \sum_{i=1}^3 \mathbf{f}_i * O_{i.} + \sum_{t=1}^5 \mathbf{d}_{1,t} * I_{.t} + \sum_{i=1}^3 \mathbf{g}_{1i.} * C_{i.} + \mathbf{n}_{it} \\ HD_{it} = \mathbf{a} + \mathbf{b}_{21}TR_{it} + \mathbf{b}_{22}W_{it} + \sum_{t=1}^5 \mathbf{d}_{2,t} * I_{.t} + \sum_{i=1}^3 \mathbf{g}_{2i.} * C_{i.} + \mathbf{e}_{it} \end{cases}$$

Where i indices countries and t time. HD_{it} is the human development variable considered, TR_{it} the transfer expenditures, Z_{it} the matrix containing the variable identifying the electoral system (that is almost time invariant), W_{it} the matrix of the control variables for the explanation of transfer expenditures and G_{it} the matrix containing the control variables for the explanation of human development; $I_{.t}$ the time dummies, $C_{i.}$ the regional dummies, $O_{i.}$ the colonial origin dummies. \mathbf{a} and \mathbf{h} are the constants and $\mathbf{b}_{11}, \mathbf{b}_{12}, \mathbf{b}_{21}, \mathbf{b}_{22}, \mathbf{g}_{1i.}, \mathbf{g}_{2i.}, \mathbf{d}_{1,t}, \mathbf{d}_{2,t}, \mathbf{f}_i$ the coefficients to be estimated. \mathbf{e}_i and \mathbf{n}_i are the error terms.

The estimation technique is a two-stage least-squares, controlling for groupwise heteroskedasticity.

In accordance with theoretical predictions, we expect the following results: first, β_{11} should be strictly positive given that, as suggested by Strauss and Thomas (1995), transfer expenditures are supposed to improve human development, second β_{21} should also be strictly positive given that, as suggested among others by Persson and Tabellini (1999), we expect that proportional systems have a stronger effect on transfer expenditures than majoritarian ones (and we expect the effect to increase with the degree of proportionality), third, $\beta_{11} * \beta_{21}$ should be strictly positive, i.e. we expect that the effect of proportional

systems is positive on human development through its effect on redistributive spending. It is obvious that an electoral system has a meaning only in democracies. For this reason, the first thing to do is to identify a way of discriminating between democratic and non-democratic regimes. For this, we rely on the famous POLITY IV democracy indicator (Jagers and Marshall, 2000) and consider only countries that have a level of democracy higher than 0⁷. Our dependent variable must be some human development indicator. We consider three such indicators that are generally accepted as adequate in the literature: the human development index calculated by the UNDP, the mortality rate and life expectancy. We describe these indicators below. Given that some of these human development indicators are only available every five years, for this analysis we will consider the period between 1975 and 1995 with five-year intervals. Removing all missing observations, we arrive at a sample of 261 observations in 59 democratic countries. Note that in order to test for the robustness of our results, we check if our findings remain consistent when we constrain our analysis only to highly democratic countries, which we choose as those corresponding to a level of democracy above 5 in the POLITY IV index.

As stated above, to measure Human Development (HD_{it}), three indicators are considered. First, the *human development index*, created by the United Nations Development Program, is an aggregate index that measures the average level of a country taking into consideration three dimensions: life expectancy, the level of education (measured by the rate of education of adults) and the average income measured by GDP per capita. In several studies, this human development indicator has been criticized for not having a constant definition over time (note that for each year, the definition is the same for all countries). To correct for this

⁷ The indicator goes from -10 to 10, where 10 represent a totally democratic regime and -10 a dictatorship.

in the empirical part, we remove the time effect and thus control for the difference in level due to those heterogeneous definitions.

The second indicator is the *mortality rate* that is often considered as a good proxy for human development. This variable indicates the number of deceased per 1000 inhabitants in the considered population i.e. the gross mortality rate = (number of deceased/total population) x 1000. It is generally considered that this rate is high if it is above 30%, moderate if it is between 15 and 30% and low if it is below the 15%. This variable is available from the International Database of the US Bureau of Census.

The third indicator used is *life expectancy* which is the average number of lived years for the entire population (life expectancy = aggregate number of lived years/population). This is also generally accepted as a good proxy for human development since it is highly correlated to the determinants of human development.

As far as the independent variables are concerned, the first one, that we call *transfers* (TR_{it}), is the logarithm of the social security and welfare spending as a percentage of GDP, provided by the Government Finance Statistics of the International Monetary Fund.

The *electoral system* (Z_{it}), is calculated as the logarithm of the mean district magnitude (lnmdmh) as can be found in the Database of Political Institutions (DPI) elaborated by the World Bank, since electoral specialists almost all agree that the principal determinant to translate votes into seats in parliamentary elections, is the district magnitude⁸.

The control variables considered here are those commonly accepted as influencing transfer expenditures and/or human development i.e. the degree of openness (trade) as proposed by Verardi (2005), calculated as being the sum of exports and imports divided by the GDP, the percentage of people older than 65 as proposed by Deaton (1997), the Output gap (ygap) as

⁸ i.e., the number of members to be elected in each electoral district.

proposed by Persson and Tabellini (2003) measured as the logarithm of the deviation of the GDP with respect to the long-run path, the logarithm of the population to take into account the size of the country ($\ln pop$) and the primary school enrollment rate as proposed by Barro and Lee (1993) and finally the GDP per capita. In addition, dummy variables identifying each year, each world region and the colonial origin are considered to control respectively for an eventual shock that may have affected all the countries during a given year (or changes in the definition of a variable), differences in the level of transfer expenditures and human development in the different regions of the world and/or an eventual Anglo-Saxon effect as insinuated in Aghion et al. (2004).

4. Main results

As stated in the methodological section, we use a two-stage (weighted) pooled regression of the logarithm of the mean district magnitude on social security spending and of the latter on the three measures of human development described above. For the sake of clarity, we present all of the results of the second stage of the regression (top of Table II) while for the first stage (bottom of Table II) we only present the results associated to the variable we are interested in, i.e. the logarithm of the mean district magnitude (Log M. D. Magnitude). In neither of the stages do we present the time specific effects that were estimated in the regressions.

[INSERT TABLE II HERE]

Analyzing the effect of the mean district magnitude on transfer expenditures (in the first stage), we see that in all cases, doubling the degree of proportionality, in the sense explained above, implies an increase of about 30% of the spending in social security and welfare. This result confirms that there is indeed a close link between electoral systems and the breakdown of government expenditures. Now we also see that social security and welfare spending, as expected, increase human development. The effect is significantly different from zero and positive in all the regressions. This thus demonstrates that electoral systems have an indirect impact on human development through their effect on the breakdown of government spending. To have an idea of the size of effect, we multiply the elasticity of social security spending with respect to the degree of proportionality (i.e. the coefficient β_{11}) by the elasticity of human development with respect to social security spending (coefficient β_{12}). The result for all the specifications is presented in Table II in the

row labeled $b_{11} \cdot b_{12}$. The results are consistent with our predictions. If the district size doubles, the human development index increases by 1.3%, the mortality rate decreases by almost 11% and life expectancy increases by almost 1% (and this for both sufficiently and highly democratic countries). Let us illustrate this by a simple theoretical example: consider a single member district (in other words, a pure majoritarian system). Doubling its size, i.e. going towards a two-member district would increase human development by 1.3 % which doesn't seem much. But consider it moves to a 40 member district (as is the case in Brazil, for example), the increase in human development would be in the neighborhood of 50% which is of course quite a lot. This also means that changing a system just a little bit might not be very effective in increasing human development, while moving from a purely majoritarian to a purely proportional system might be much more efficient.

5. Conclusion

Human development is a concept that is gaining interest in the academic economic scientific literature. From the seminal work of Sen (1990), substantial interest has been clearly directed toward the topic, while it is becoming more and more accepted that human development is without any doubt a key concept to understand if a society is reaching its economic goals or not. Several causes for human underdevelopment have been considered in the literature. In this paper we try to understand if political institutions, in particular electoral systems, can be considered as playing a role in this matter as well. Our findings are promising: using simple econometric techniques and several definitions of human development we find strong evidence showing that electoral systems affect human development through their effect on social security and welfare spending.

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Table I: Average Human Development and Average Welfare Spending by Type of System

	Variable	1975	1980	1985	1990	1995
Proportional	Social Security	7.46	8.60	9.51	8.43	10.51
	Human Development	0.73	0.76	0.78	0.79	0.81

Majoritarian	Social Security	4.75	4.80	4.96	4.43	4.83
	Human Development	0.66	0.73	0.71	0.75	0.75

Table II: Mean District Magnitude and Human Development

	Log Human Developmen t	Log Mortality	Log Life expectanc y	Log Human Developmen t	Log Mortality	Log Life expectanc y
Log Social Security	0.042*** (3.49)	-0.374*** (4.33)	0.025*** (2.74)	0.043*** (3.72)	-0.380*** (4.26)	0.027*** (3.08)
Log Population	-0.002 (0.26)	0.107*** (3.28)	0.001 (0.13)	-0.011 (1.33)	0.113** (2.66)	-0.004 (0.72)
GDP per capita	0.000*** (4.90)	-0.000*** (3.92)	0.000** (2.09)	0.000*** (4.78)	-0.000*** (3.81)	0.000** (2.02)
Latin America	0.002 (0.05)	0.408** (2.24)	-0.016 (0.79)	-0.011 (0.42)	0.370* (1.94)	-0.019 (0.87)
Asia	-0.004 (0.07)	-0.325 (1.20)	-0.036 (0.96)	0.050 (0.95)	-0.467 (1.39)	0.008 (0.19)
Africa	-0.164** (2.40)	0.496** (2.40)	-0.128** (2.24)	-0.165*** (2.87)	0.446** (2.14)	-0.119** (2.41)
Openness	-0.000 (0.79)	0.002 (1.56)	-0.000 (0.11)	-0.001 (1.42)	0.002 (1.29)	-0.000 (0.64)
Output Gap	0.011** (2.53)	-0.008 (0.64)	0.000 (0.22)	0.010** (2.52)	-0.008 (0.56)	-0.000 (0.20)
School enrollment	0.006*** (4.67)	-0.003 (0.80)	0.002** (2.25)	0.007*** (5.87)	-0.005 (0.99)	0.003*** (2.81)
Constant	-0.969*** (5.44)	2.626*** (3.31)	3.920*** (27.01)	-0.910*** (4.88)	2.747*** (2.93)	3.935*** (24.31)
	Log Social Security					
Log M. D. Magnitude	0.304*** (4.56)	0.291*** (4.62)	0.339*** (5.01)	0.280*** (3.68)	0.278*** (3.95)	0.340*** (4.08)
$\mathbf{b}_{11} \cdot \mathbf{b}_{12}$	0.013	-0.109	0.008	0.012	-0.106	0.009
Observations	143	136	117	131	124	106
R ²	0.89	0.84	0.77	0.90	0.84	0.79

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1: Human Development and Social Security Expenditures

