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"Traders, Teachers, and Tyrants: Democracy, Globalization, and Public Investment in Education"
by
Ben Ansell

Working Paper Series

Traders, Teachers, and Tyrants: Democracy, Globalization, and Public Investment in Education

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Paper No. 06-01

January 2006

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Abstract

The globalization debate has largely been fought between those who prophesize a "race to the bottom" in government expenditure and those who foresee continued divergence, with some states better shielded from global economic volatility. However, over the past few decades there has, in fact, been "upward convergence" in the percentage of national income governments devote to public education, albeit amidst considerable cross-national variance. This phenomenon has an enormous distributional impact, yet it has been largely neglected by political scientists. What explains this tremendous shift? This paper argues that two forces in particular shape the aggregate pattern of human capital expenditure: the level of democracy and the level of openness of any given state. By developing a model of the political economy of education investment, and testing its implications over a dataset of 115 countries from 1960 to 2002, this paper provides a first cut at explaining this critical issue.

Introduction

The globalization debate has largely been fought between those who prophesize a "race to the bottom" in government expenditure and those who foresee a continued divergence among those states who can shield themselves from global economic forces and those who cannot.[1] This dialog has, however, largely ignored a significant display of "racing to the top", apparent in government investment in education or "human capital".[2] Since 1960 there has been a momentous increase in the proportion of national income that governments devote to educating their citizens. This is a phenomenon with an enormous distributional impact. Numerous econometric studies have shown a robust and substantively significant relationship between the provision of education and economic growth.[3] Politicians have, perhaps unsurprisingly, been even more hyperbolic: the British Chancellor of the Exchequer and the governor of the Bank England declared that "education is the best anti-poverty and social and economic development strategy".[4] Figure One demonstrates the magnitude of the average increase in educational

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[1] On downward convergence see Rodrik 1997 and Kurzer 1992, on continued divergence see Kitschelt, et al. 1999, Swank 2002, and Hall and Soskice 2000. Burgoon 2001 provides an excellent summary of the debate over globalization's impact on the welfare state.

[2] The major exception is the literature on how globalization leads to the expansion of compensatory welfare states, e.g. Katzenstein 1985, Garrett 1998, and Rodrik 1998. However, this literature largely focuses on globalization as increasing macroeconomic variance and thus as a potential negative shock rather than as a positive opportunity. Moreover, most of these works focus solely on the OECD countries.

[3] Well-known analyses of education's positive impact on growth include Mankiw et al 1992, Barro 1997, Hall and Jones 1999, and Bils and Klenow 2000.

[4] Gordon Brown and Eddie George in 2002, as cited in Wolf 2004.

expenditure: whereas in 1960 the international average expenditure on education as a percentage of GDP was 2.5%, by the mid 1990s this had almost doubled to around 4.7%.

Figure One –Growth in Public Investment in Education 1960 to 1995
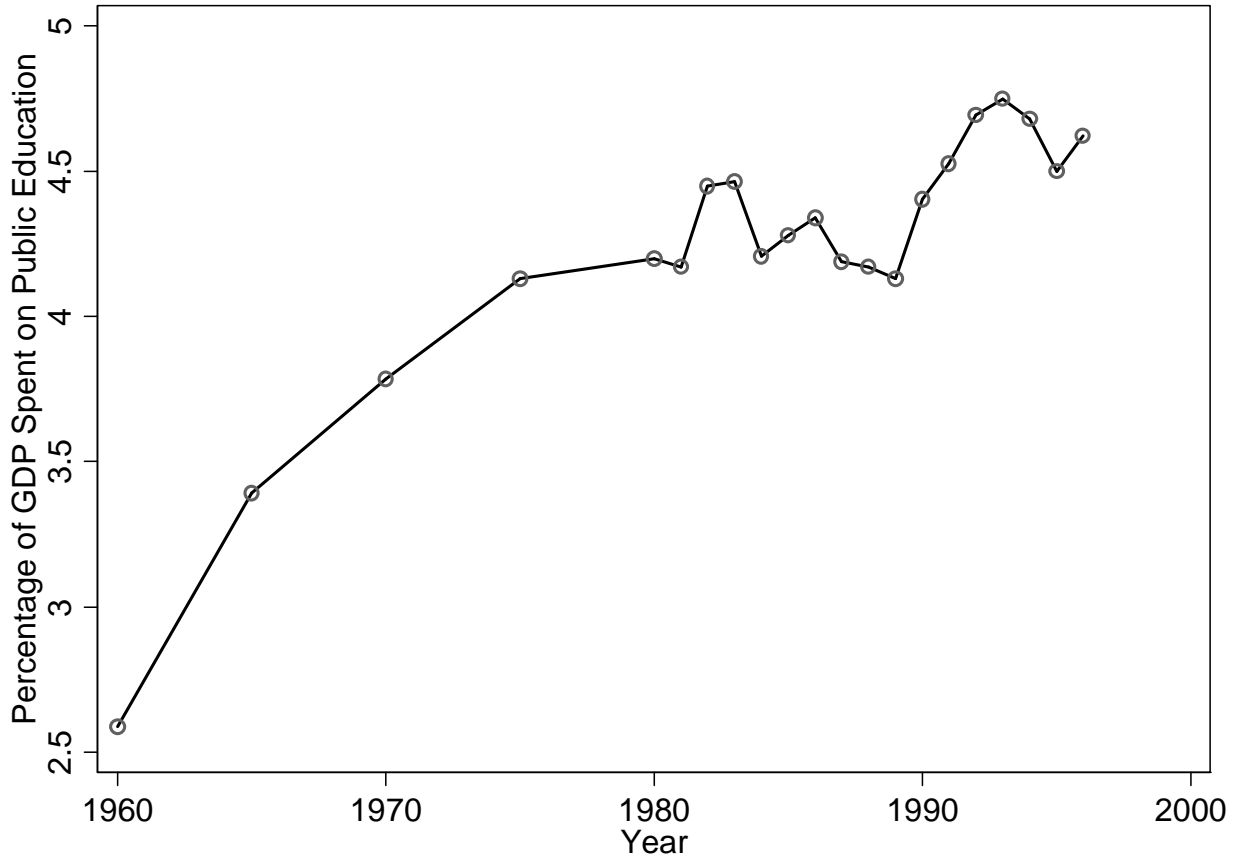
However, despite this overall upward trend in education, there remains considerable cross-national variance. The cross-national standard deviation of expenditure on education as a percentage of GDP has actually doubled since 1960. This implies that whereas in 1960, 95% of states spent between 0.5% and 4.5% of their national income on education (e.g., ranging from Nepal to the United States in 1960), by 1995 this range had increased to between 0.5% and 8.5%, (e.g., ranging from Equatorial Guinea to Denmark in 2000). Figure Two, which presents kernel density estimates of

public education spending across a sample of 115 states, demonstrates this significant increase in variation.

Figure Two Kernel Density Function of Public Education Spending 1960 to 1995
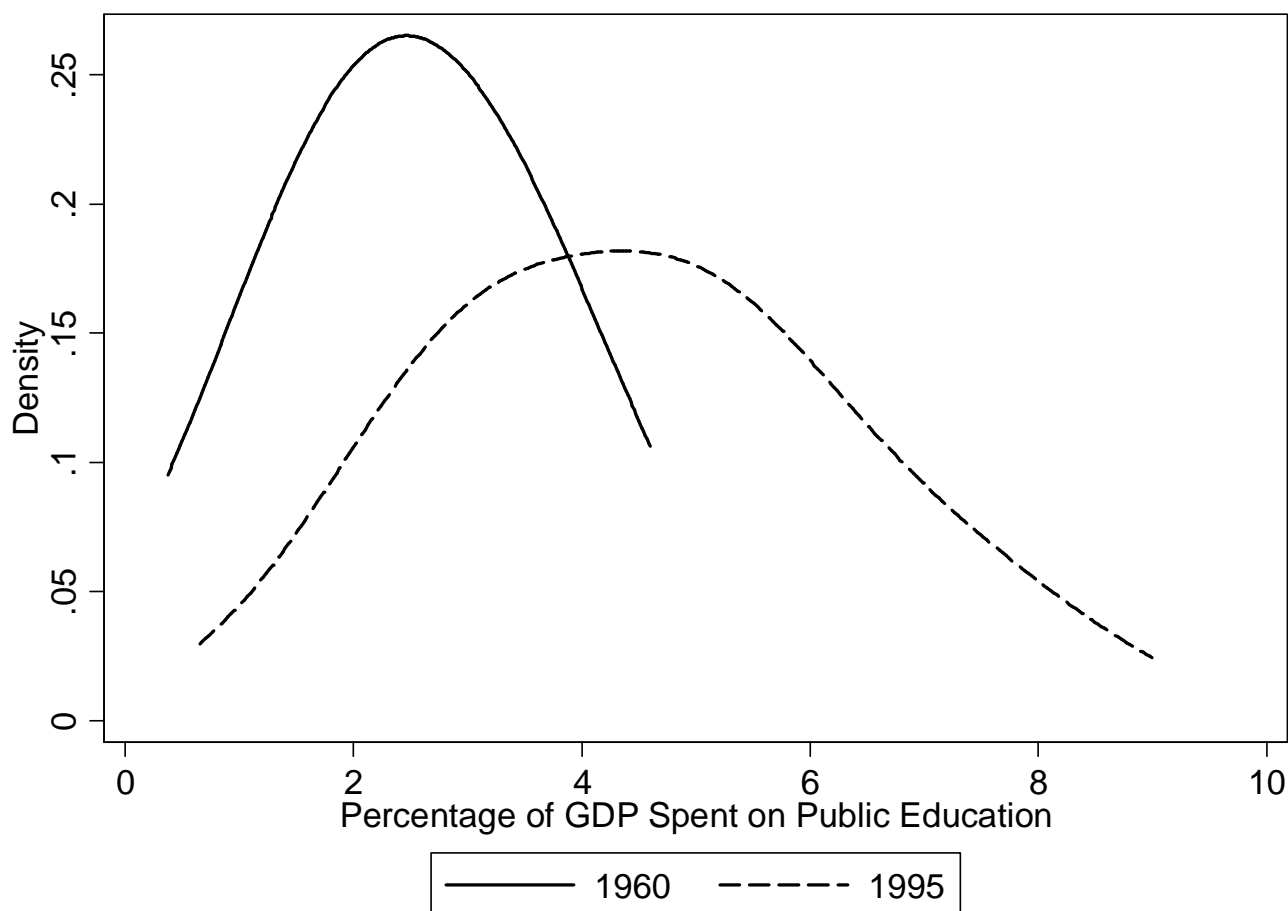
What then explains both this tremendous upward shift and the contemporary cross-sectional variation? This paper argues that two forces in particular shape the aggregate pattern of human capital expenditure: the level of *democracy* and the level of *openness* of a given state. Human capital investment greatly affects the future distribution of resources in society by using education to reshape the distribution of income. Thus we should expect that institutions like democracy that effectively represent

the interests of the poorer members of society will respond to demands for such *future redistribution* through the provision of public education. However, regime type alone cannot explain all of the observed variation. In a closed economy the increased supply of education will, all else equal, reduce the rate of return to educated workers. This creates strong incentives to restrain education spending. Thus, autarkic states, even democracies, may still fail to fully expand education provision. In an open economy, however, factor returns are determined by global, rather than, domestic market forces. An increased supply of education is thus no longer met by a serious decline in the returns to education. We should, hence, expect states that become more open to the international economy to increase their provision of education. Thus, the expansion of a country's political sphere, through democratization, and their economic sphere, through globalization, should be met by a consequent increase in the sphere of education.

By and large, political economists have focused on the impact of democracy and globalization on forms of *immediate* redistribution, like unemployment benefit.[5] However, the study of their impact on *future redistribution* through education is a less trodden path. This paper attempts to remedy the general neglect of the cross-national determinants of education investment by developing a coherent formal framework and testing it using a global dataset spanning over forty years. The assertion that education policy and democracy are linked is not unique within the literature. A small literature on the relationship between education and democracy has developed recently, including important works by Lake and Baum (2001), Brown and Hunter (2004), Lindert (2004),

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[5] Burgoon 2001. Rodrik 1998. Moreover there is a large literature on the effects of political institutions on *immediate* redistribution, e.g. Persson and Tabellini 2000, Iversen and Soskice 2001, Stephens, et al 2003.

and Stasavage (2004). However, there has not been a coherent attempt to both formally model the connection between democracy and investment in education and test these findings over a global dataset. Lake and Baum, for example, examine the political determinants of secondary enrollments rather than educational spending, and although Brown and Hunter, Lindert, and Stasavage examine the latter variable they do so within limited regions. Moreover, with the exception of Lindert, none of these studies have fully addressed the problem of reverse causation that bedevils the link between democracy and education. Finally, and most critically, this paper also contributes an analysis derived from the same formal framework, of how openness to the international economy affects education expenditure. The structure of this argument is developed as follows:

- In Section Two, the paper develops a model demonstrating how states with elite control will systematically under-provide human capital as compared to the preferences of a "true" democratic median voter.

- Section Three tests this proposition using the well-known Polity IV dataset on democracy with a sample of 115 states from 1960 to 2002. This statistical analysis is followed by a brief case comparison of the relationship between regime change and educational expenditure in the Iberian peninsula and in the Philippines.

- Section Four extends the formal model to incorporate open economy analysis and follows this formalization with further empirical analysis. Various measures of openness, including imports and exports, duties, and deviations from predicted levels of trade, are used to operationalize the openness mechanism and incorporated into the statistical analysis. A brief case comparison follows of

education expenditure in two highly closed South Asian states—India and Bangladesh—and two highly open nearby states - Thailand and Malaysia.

- Section Five concludes by summarizing the relationship between open polities, open economies, and education expenditure.

Section I: A Simple Model of Human Capital Investment

Public investment in human capital is, at its core, a political decision over the distribution of future endowments among the population. Hence, it is imperative to examine precisely the manner in which economic preferences over human capital are aggregated through political institutions. The following model demonstrates that the greatest beneficiaries of human capital investment are those individuals who (or, by extension, whose children) are most likely to move from being unskilled to skilled. Thus, the presently unskilled are assumed to prefer further human capital investment. This preference can hold even if some of the unskilled are unlikely to be the direct beneficiaries of educational investment because increased skill provision should (at least in a closed economy) increase unskilled relative wages. On the other hand, the already skilled lose out from human capital investment in two ways: firstly, because their income is above the mean they are always negatively affected by redistributive policy; secondly, because the value of their skills (and of their children's) is reduced as skill provision expands. This implies that the key political dimension of human capital investment will be the present skill level and income of the median voter. Thus, the model implies that in states where the skilled elite controls decision-making, investment in human capital will,

all else equal, be lower than in democracies, where the voter with median income is the central political decision-maker.

The model proceeds in three stages. Firstly, I develop a model of income distribution, both on an individual basis, and between skilled and unskilled workers. Secondly, I examine the provision of human capital and how this affects taxation. Finally, I examine preferences over human capital policy and how different "median voters" will lead to different national human capital policies.

The Distribution of Income

The following model assumes that individuals can be divided into skilled and unskilled groups, with respective wages w_s and w_u. It also assumes that individuals can also be differentiated along an individual income distribution: q_i. Total income for any given individual is the sum of these two components: $y_i = q_i + w_J$, where $J = \{S, U\}$. Thus, any individual's income is comprised of a group-defined element (skilled versus unskilled) and an individualized element. The only restriction on the relation between the group and individual components of income is that for all individuals who receive w_S, q_i is greater than for those individuals receiving w_U: this ensures that y_S is always higher than y_U. The population of the country in the model is normalized to one and it is divided into a proportion S who possess the group skill, receiving w_s, and a proportion *(1-S)* who do not possess the group skill, receiving w_u. Individuals fall into the skilled group provided that: $(1 - q_i) = s_i \leq S$. That is, those individuals whose individualized income is higher than the threshold q_i (subtracted from one to create an individual "skill" index s_i, which measures an individual's position on the skill distribution, where zero represents the most skilled) are denoted as skilled. These group wages, w_s and w_u, are

dependent on the aggregate supply of skills S. As the supply of skills S gets larger, the rate of return to skills w_s decreases and the rate of return to unskilled labor w_u gets larger. This can be seen in the following labor market equations:

$$w_s = \sigma_s - bS \qquad w_u = \sigma_u + aS$$

Wages are a function of σ_J (the basic rates of return at $S = 0$) and the skill supply response parameters a and b, which determine the slopes of the wage functions. In order to move an individual from being unskilled to skilled there is a cost of skilling c. We can parameterize c in a number of manners—as a uniform cost, as linear in s_i, or as convex in s_i—without fundamentally altering the subsequent results. However, I choose to use linear costs, both to aid simplicity of presentation and because in practice skilling costs appear roughly to follow a linear pattern.[6] Thus, we can observe in the model $c_i = ks_i$, where k is a constant. From an aggregate perspective it only becomes viable to upskill an individual if the difference in present and future wages is greater than or equal to the cost of upskilling. Thus, we can show that at the margin: $w_s - w_u = c_i{}^* = ks_i{}^* = kS^*$. Since up-skilling the entire population becomes increasingly expensive due to linear costs, an equilibrium policy will tend to leave some of the population unskilled. This basic model is demonstrated simply in Figure Three.

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[6] The linear model of cost is consistent with typical results on skilling: for example training a skill 'Level 1' worker to skill 'Level 2' in the UK costs £1800, whereas training a 'Level 0' worker to 'Level 2' costs £3600. (HM Treasury 2004).

Figure Three – The Basic Factor Supply Model
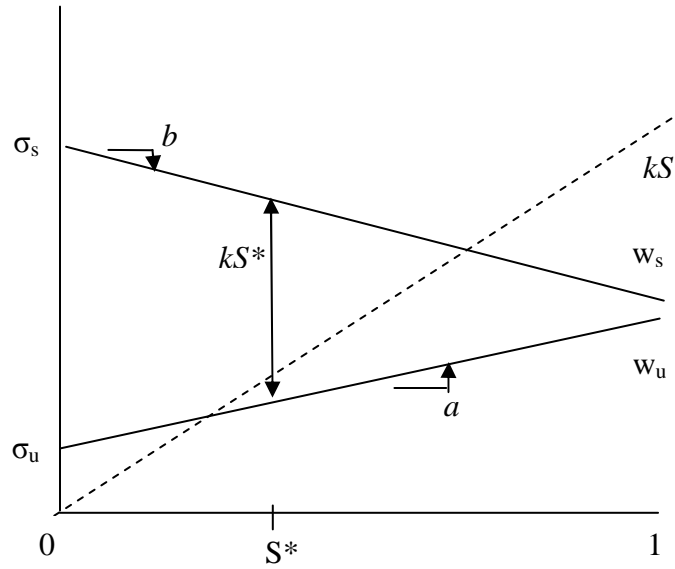
This basic version of the factor supply model, demonstrates the effects of total skill supply - $S \in [0,1]$ - on wage rates and the cost of skilling. As the proportion of individuals who are skilled rises, three effects are noticeable: firstly, skilled wages decline (at rate *b*); secondly, unskilled wages increase (at rate *a*); and thirdly, the cost of skilling the marginal unskilled person increases. Note that the cost of skilling at S^* is equal to the gap between skilled and unskilled wages. Even though the size of this skill premium declines as $S > S^*$, the increased cost of skilling means that the equilibrium at S^* still holds.

Taxation and Human Capital Investment

When the government invests in human capital it must pay the cost of upskilling citizens through taxation. As noted above, costs are linear in individualized income, and are cheapest for the wealthiest citizens: $c_i = ks_i = k(1 - q_i)$. The model of human capital investment is constructed over two periods (zero and one) and assumes group

skills can cannot be carried over from period to period.[6] Thus all individuals in the skilled group in round zero will become members of the unskilled group in round one unless public investment is made in human capital. We can think of this assumption as mirroring a two-generational set-up where parents earning skilled wages still rely on public education to skill their children. The individualized income parameter q_i represents a parent's ability to leave an educational bequest to their offspring, which advantages their acquisition of the group skill. Such bequests could be private out-of-school tuition, purchase of educational materials, etc.[7] Hence, it is cheaper to educate the children of those with high q_i. The overall cost of public investment in human capital for round one must be met by taxation of round zero income, which is derived from a flat rate tax t. The total tax revenue will be the tax rate multiplied by average round zero income or $t(\bar{y}_0)$.

$$t(\bar{q} + w_s S_0 + w_u(1 - S_o)) = t(\bar{y}_0) = \int_0^{s_i^*} k s_i ds_i$$

The budget constraint above shows that the tax take from average income in round zero must equal the summation of the costs of skilling for each individual from the most skilled ($s_i = 0$) to the marginal individual (s_i^*). After integrating, we get the following results:

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[6] This assumption is often made in the literature on human capital investment, e.g. Persson and Tabellini 2000. However, the model also holds if we allow skilled workers to maintain their skills in both periods.

[7] This assumption could also be made if we assume a convex cost function for the production of education, that is, because of diminishing returns to inputs like teaching, or because of a fixed, scarce input.

$$t\bar{y}_0 = \frac{k}{2}\left(s_i^*\right)^2 \Rightarrow t = \frac{k\left(S_1\right)^2}{2\bar{y}_0} \qquad S_1 = s_i^* = \left[\frac{2t\bar{y}_0}{k}\right]^{\frac{1}{2}}$$

Thus, we can derive an equation demonstrating the level of education provided in round one, S_1, as a function of the rate of taxation t, round zero average income $(\bar{y}_0)$, and the marginal cost of skilling k. The next section demonstrates how individual preferences over investment emerge and how the structure of political institutions affects policy outcomes.

Individual Preferences and Political Equilibria

With the budget constraint spelled out we can now examine individual preferences over public provision of human capital. Individuals have a utility function comprised of their net round zero income $(1 - t)(q_i + w_{J0})$, their child's income (assuming perfect intergenerational altruism) $(q_i + w_{J1})$, and any further externalities produced by human capital investment $g(S)$, the latter two elements adjusted by a discount factor δ:

$$U_i = (1 - t)(q_i + w_{J0}) + \delta[(q_i + w_{J1}) + g(S_1)]$$

The marginal impact of taxation and human capital investment on an individual's utility depends on their position in the income/skill distribution:

$$\frac{\partial U_i}{\partial t} = -[q_i + w_{J0}] + \delta\left[\frac{\partial w_{J1}}{\partial S_1}\frac{\partial S_1}{\partial t} + \frac{\partial g(S_1)}{\partial S_1}\frac{\partial S_1}{\partial t}\right]$$

The effects of taxation on individuals are their loss of round zero earnings through taxation and the round one effects on their children's wages and on externalities. Both of these latter discounted effects contain a term representing the marginal effect of taxation on round one skill provision, which can be derived from the budget constraint equation:

$$\frac{\partial S_1}{\partial t} = \frac{\bar{y}_0}{kS_1} = \left[\frac{\bar{y}_0}{2tk} \right]^{\frac{1}{2}}$$

Since we assume that $g'(S)$ is positive (that is, greater provision of skills leads to greater externalities), the only remaining element to be analyzed is the effect of skill provision on round one skilled versus unskilled wages. This effect depends on two factors: firstly, the supply elasticities, b and a, of skilled and unskilled wages with respect to skill supply; secondly, the probability of becoming skilled, which depends on an individual's position on the skill distribution.[8] This is defined as $p(s_i) = p_i$, where $p'(s_i) < 0$ and $p_i'(S_1) > 0$:

$$\frac{\partial w_{J1}}{\partial S_1} = \left[\frac{\partial p_i}{\partial S_1} \left[w_{S1} - w_{U1} \right] - bp_i + a\left(1 - p_i\right) \right]$$

The effects of human capital provision on round one wages thus come in three types. Firstly, there is an increased probability of receiving skilled rather than unskilled wages in round one, which depends on the parents' place on the individual skill distribution. Secondly, if the child does become up-skilled for round one, there is a negative effect of increased skill supply on the skilled wages they receive in that period – a higher supply of skilled workers lowers skilled wages. Conversely, if the child does not become skilled in round one, there is a positive effect from increased skill provision, which increases the relative value of unskilled wages. Putting these equations together produces this result:

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[8] This implies that for any given expansion of education, an individual has a lower probability of receiving it if they are further along the skill distribution, that is, if they have a lower q_i. However, the larger the expansion of education is, the higher is the probability of receiving the skill endowment.

$$\frac{\partial U_i}{\partial t} = -[q_i + w_{J0}] + \delta \left[\frac{\bar{y}_0}{2tk} \right]^{\frac{1}{2}} \left[\frac{\partial p_i}{\partial S_1} [w_{S1} - w_{U1}] - bp_i + a(1 - p_i) + \frac{\partial g(S_1)}{\partial S_1} \right]$$

We can now establish an equilibrium tax-rate and skill provision level for each individual by taking the first order condition of this equation and re-arranging it:

$$t_i^* = \frac{\bar{y}_0}{2k} \left[\frac{\delta}{y_{i0}} \left(\frac{\partial p_i}{\partial S_1} [w_{S1} - w_{U1}] - bp_i + a(1 - p_i) + \frac{\partial g(S_1)}{\partial S_1} \right) \right]^2$$

$$S_{1i}^* = \frac{\bar{y}_0}{y_{i0}} \left[\frac{\delta}{k} \left(\frac{\partial p_i}{\partial S_1} [w_{S1} - w_{U1}] - bp_i + a(1 - p_i) + \frac{\partial g(S_1)}{\partial S_1} \right) \right]$$

This produces the following comparative statics:

1) *An individual's optimal tax rate and level of human capital investment are increasing in round zero average income, the discount rate, the round one skill premium, the increase in their probability of being skilled, the supply elasticity of round one unskilled wages, and the marginal production of externalities.*

2) *An individual's optimal tax rate and level of human capital investment are decreasing in the marginal cost of education, their round zero income (both for the individual and the group), and the supply elasticity of round one skilled wages.*

What can be seen from above, in particular, is that presently skilled workers are always likely to prefer lower levels of investment in human capital than the unskilled. Why is this the case? Presently skilled workers have higher individualized wages and higher round zero group wages, a proportion of which they lose through taxation. They are also most likely to have their children educated in round one so they have a high probability of seeing their children's wages reduced in round one through the skill supply effect. Unskilled workers, conversely, lose less of their round zero income through taxation and their children stand to benefit from increased group wages in round one, either because

they move from being unskilled to skilled, or because they receive higher unskilled wages as unskilled workers become scarcer. To complete the analysis let us examine how different "median voters" affect the equilibrium rate of human capital provision. If we rephrase the optimal skill provision equation with reference to the median voter, we obtain:

$$S_{1\,med}* = \frac{\overline{y}_0}{y_{0\,med}}\left[\frac{\delta}{k}\left(\frac{\partial p_{med}}{\partial S_1}\left[w_{S1} - w_{U1}\right] - bp_{med} + a\left(1 - p_{med}\right) + \frac{\partial g(S_1)}{\partial S_1}\right)\right]$$

This formulation makes it simple to see how the median voter's preferences over education vary according to their relative income. In particular, the difference between the mean income and the median voter's income is the key determinant of education policy. As the median voter's income drops below the mean income, the level of skill provision gets ever higher.[9] In an autocracy, we should expect the "median voter" to have an income significantly higher than the mean citizen's income because of the restriction of the franchise to the elite (or even the leader themselves). Thus, autocracies will have a relatively low level of public education provision. In a full democracy, conversely, the median voter should have the median level of income in the state, provided we assume a uni-dimensional policy space. Since income is generally thought to be distributed in a log-normal fashion, this means that the median income is lower than the mean income, implying that the multiplier at the front of the above equation is greater than unity.[10]

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[9] As long as the skilled wage elasticity effect does not outweigh the combined effects of the increased probability of receiving higher wages, the unskilled wage elasticity and the production of externalities. This assumption is highly likely to hold.

[10] This logic is very similar to that famously outlined in Meltzer and Richard (1981). However, whereas individuals with an income higher than the mean strictly disfavored taxation in Meltzer and Richard's

Democracies are thus expected to have a higher level of education provision than autocracies, all else equal, an assertion tested in depth in the following section.

Section III: Examining the Relationship between Democratization and Education

The model developed in Section Three, predicted that states whose median voter was skewed away from the individual with median levels of income would systematically under-provide human capital. This section tests this proposition using a 115 country dataset from 1960 to 2002. To be specific, I examine the effects of changes in a country's level of democracy—using the well-known Polity IV dataset—on the proportion of national income devoted to public expenditure on education. The hypothesis developed in the previous section can be spelled out explicitly as:

H1: Increased levels of democracy, as measured by a state's Polity score, will be associated with increased public expenditure on education as a percentage of GDP.

Before examining the statistical results obtained, it is important to describe and justify the choice of variables used. The formal model of human capital investment laid out above focuses on moving individuals from an unskilled group to a skilled group. Obviously, because this is a simplification of the process of human capital development, it is impossible to find a precise analog. There are clearly a number of mechanisms through which such human capital can be acquired: education, on-the-job training, private study, etc. However, in terms of aggregate national figures the only variable that proves a tractable measure of state investment is public expenditure on education as a

formulation, because the model in this paper provides externalities and because education must be funded publicly, even the skilled prefer a strictly positive rate of taxation. Nonetheless, the relationship of mean to median income is the key determinant of preferences.

percentage of GDP.[11] This variable comes from the World Bank's World Development Indicators and is available for 115 states from 1960 to 2002, with an average of 15.4 observations for each state. The variable covers all state expenditure on primary, secondary, and tertiary education and within the analysis is referred to as *public education expenditure*. Across the sample this variable has a mean of 4.2 and a standard deviation of 1.9.

The variable has a number of advantages. Firstly, it has been widely used in the economic literature examining the causes of cross-national variation in growth.[12] Secondly, because it is a ratio it is comparable across states of different sizes and incomes in a way that absolute expenditure figures are not. Finally, it allows easy comparison with the percentage of income devoted to overall government expenditure, which demonstrates the *relative* significance of human capital expenditure vis-à-vis other options open to governments. However, this measure is hardly flawless, since it fails to indicate the intensity of educational expenditure. States with high population growth have extremely young populations; thus, a given percentage of national income devoted to education will lead to a smaller amount per student in a country with a high proportion

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[11] A number of other studies, e.g. Barro 1997, Lake and Baum 2001, use secondary enrollment figures as their proxy for education. Expenditure figures, however, allow us to better link investment in education to the model developed in Section Two, since they measure inputs rather than outputs.

[12] Barro and Lee 1994, and Hall and Jones 2000.

of young educated people. Thus, the analysis controls for the proportion of *population below fifteen years of age*.[13]

The model developed in the last section implied that the position of the median voter in the income distribution would impact the level of educational expenditure. To capture this mechanism I use the Marshall/Jaggers Polity IV variable *Polity2*.[14] This well-known variable ranges from -10 (the most autocratic state) to +10 (the most democratic state) by one-point increments. *Polity2* has a mean of 0.29 and a standard deviation of 7.6. While the Polity score is comprised of a variety of scores on competitiveness and restrictions on executive participation and recruitment (which add a layer of complexity not fully represented by the model of the previous section) the overall -10 to 10 range corresponds effectively to the concept of the position of the median voter used in the model.[15]

A number of control variables are also included in the data analysis in order to capture key factors that may impact educational expenditure. I control for the overall level of *government expenditure*, which is set as a percentage of national income (excluding that devoted to education) in order to control for the size of the public sector. This is critical since many authors assert that democracy is related to the overall size of

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[13] This age is chosen because it had the best data availability (it derives also from the World Development Indicators). Although *public education expenditure* includes some students between 15 and 21, one should expect a high degree of correlation between the proportion under 15 and the proportion under 21.

[14] Marshall and Jaggers 2002.

[15] A further justification for using the Polity score is its use in the existing literature on the effects of political institutions on social spending, e.g. Lake and Baum 2001 and Brown and Hunter 2004.

the public sector.[16] I also control for a state's *gross domestic product* in 1995 $US in order to account for possible "Wagner's Law" effects, and for *population*, to control for scale economies in the provision of public goods. I use logs of these variables as standard in the literature. The analysis also includes a quadratic term, *squared log gross domestic product*, to take account of the potential concavity of the income effect on education, that is, the diminishing marginal returns to spending extra income on education. Finally, a time trend is also used to capture the secular increase in educational expenditure and thus prevent confusing the fact that both democratization and educational expenditure have trended upwards over the past five decades with the actual causal effect between the two factors. All of these variables were obtained from the World Development Indicators database.

The data analysis tests a variety of cross-sectional time-series models in order to test the robustness of the suggested relationship between democracy and education spending. The first test uses the Beck-Katz panel corrected standard error (PCSE) technique.[17] The PCSE technique essentially adapts standard ordinary least squares (OLS) regression to take account of the potential temporal autocorrelation and cross-national contemporary correlation that bedevils panel data. By adapting the error term of the OLS regression to incorporate a first-order autoregressive process (AR1), and then adjusting standard errors for contemporaneous correlation, the PCSE method permits standard   OLS   regression   to   be   utilized.   Thus,   the   basic   model   is:

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[16] Boix 2001, and Boix and Adsera 2002. Others, including Rodrik 1998, also assert a relationship between openness and public spending, thus controlling for government expenditure will also prove critical in Section Five, which examines the effects of openness on education expenditure.

[17] Beck and Katz 1995.

$Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \gamma Z_{i,t} + e_{i,t}$, where Y is the dependent variable, $Y_{(t-1)}$ is a one-period lag of the dependent variable, X is the key independent variable of interest (*Polity2*), Z is a vector of control variables, and e_{it} is an AR1 error term with composition $e_{it} = \rho e_{it-1} + \varepsilon_{it}$. The PCSE method then adjusts the resulting standard errors for contemporaneous correlation. The major advantage of this method is that it enables the analyst to account for the whole range of temporal and cross-national variation in the dataset, while reducing the types of serial correlation problems endemic in panel data. The PCSE method is used in Model A in Table One.

The second test uses the classic fixed effects panel data method—another standard approach for cross-country analyses of this type. Unlike standard PCSE regression, fixed effects models permit each state to have a different time-invariant error term (or, put differently, a different constant in the regression). This method thus controls for the fact that all time periods for one state share the same valuable on one measure—they belong to a specific state with possibly idiosyncratic educational expenditure. The model used is thus: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \gamma Z_{i,t} + u_i + e_{i,t}$, where the key difference from before is that the regression equation now includes a country-specific error term. The downside of fixed effects regressions is that because of the country-specific intercepts, they essentially measure deviations from group means, rather than the differences between group means, that is, they are within-groups estimators rather than between-groups estimators. This means that while fixed effects regression is an effective way to examine how changes in democracy affect educational expenditure in a given state, differences are brushed over between states that are always highly democratic and

high spenders on education and those that are always autocratic and low spenders. The fixed effects method is used in Model B in Table One.

The third model used is a dynamic variant of the fixed effects model known as Arellano-Bond estimation (henceforth ABOND).[18]   This method first differences the fixed effects model (after removing the lagged dependent variable) to produce the following equation:

$$Y_{it} - Y_{it-1} = \beta(X_{it} - X_{it-1}) + \gamma(Z_{it} - Z_{it-1}) + (e_{it} - e_{it-1})$$

This differs from fixed effects regression by examining solely the period changes in the relevant dependent and independent variables and thus directly analyses how period shocks to democracy affect the short run first difference in educational expenditure. The ABOND method is used in model C in Table One.

The final two models deal with a potential bugbear in the analysis: the possibility of reverse causation. It is quite possible that education itself could lead to democratization, a theme touched upon in many works of modernization theory.[19] If this effect is real, then the resulting endogeneity of our *Polity2* variable will seriously bias our coefficients because it will correlate with the error term. There are strong reasons to believe that, in fact, this reverse causation is unlikely to be driving the results obtained earlier. For one thing, the dynamic Arellano-Bond model estimates that there is a strong period change effect of democracy on education. However, it is difficult to imagine how the reverse situation could hold, that is, that a one period change in education would lead to a sudden shift in regime type. Moreover, Acemoglu et al. have recently demonstrated

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[18] Greene 2003. 308.

[19] Lipset 1959.

that the purported causal effect from education to democracy is an artifact of between country correlation and is not apparent in fixed effects models.[20]

Nevertheless, it is imperative to adjust the empirical work to take account of this potential criticism. To do so, I develop two instruments for democracy, used in Models D and E. It should be noted that developing instruments for usage in fixed effects models can be challenging since it requires finding measures that covary with the potentially endogenous variable *across time* rather than space. Thus, we cannot use common instruments for democracy like colonial origins or religion, since these are not time-varying across any tractable sample period. The first instrument I employ is the *five year lag of Polity2*, used in Model D. This has the advantage of a high correlation with the *Polity2* measure (0.86). However, there are a number of serious problems with using lags as instruments, the chief being that any serial correlation in the error term will retain the bias. In the case of the five year lag this is true only if serial correlation extends back five years but it is nonetheless a major concern. Moreover, there is rarely ever any *substantive* justification for using lags as instruments. Instead, Model E uses the *average Polity2 score in a country's region* as the instrument (correlation of 0.74). This has some substantive import and is not prone to the lag autocorrelation problem. Moreover, it is substantively exogenous—we have no reason to expect that the level of democracy in a region is caused by one particular state's education policy. Both Models D and E perform two-stage least squares regression using these instruments and incorporate country-fixed effects.

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[20] Acemoglu et al. 2004.

Table One: Democracy and Public Expenditure on Education

	MODEL A PCSE	MODEL B FIXED EFFECTS	MODELC ABOND FIXED	MODEL D IV LAG 5 DV	MODEL E IV REGION
LAGGED DV	.828 (.013)***	.615 (.017)***	.546 (.032)***	.625 (.021)***	.620 (.020)***
POLITY	.007 (.003)**	.014 (.005)***	.023 (.008)***	.023 (.008)***	.021 (.010)**
POP <15	-.000 (.004)	-.013 (.011)	-.049 (.027)*	.005 (.012)	-.002 (.013)
LOG (GDP)	-.116 (.205)	2.095 (.822)**	10.179 (2.407)***	2.008 (.954)**	2.238 (.885)**
LOG (GDP) SQ	.003 (.004)	-.038 (.017)**	-.215 (.051)***	-.038 (.019)**	-.041 (.019)**
LOG (POP)	-.093 (.026)***	-.049 (.225)	-1.470 (.579)**	.052 (.249)	-.090 (.246)
GOVT EXP	.013 (.004)***	.004 (.006)	-.002 (.007)	.002 (.007)	.006 (.007)
YEAR	-.013 (.003)***	-.016 (.006)***	.023 (.014)	-.016 (.007)**	-.015 (.007)**
CONSTANT	29.738 (5.476)***	7.342 (14.324)	-	4.439 (16.106)	3.988 (15.280)
N / STATES	1526 / 115	1526 / 115	1150 / 113	1465/112	1526 / 115
ADJ. R SQ	.826	.894	-	-	-
Short run FD	+ 0.14**	+ 0.28***	+ 0.46***	+ 0.46***	+ 0.42**
Long run FD	+ 0.81**	+ 0.73***	+ 1.06***	+ 1.23***	+ 1.11**

Standard errors in parentheses * = $p < 0.1$, ** = $p < 0.05$, *** = $p < 0.01$

Table One reports results using the methods outlined above to analyze the effects
of democratization on *public education expenditure*. Across all of the models, including
the instrumental variables models, the coefficient relating the *Polity2* score to *public
education expenditure* is statistically significant at the *$p < 0.05$* level. The purported
magnitude of the coefficient varies between 0.007 and 0.023. In order to interpret this

coefficient, it is most useful to examine short run and long run first differences. If we imagine a state converting from a full autocracy to a full democracy in a given period, this implies a change of twenty points in the *Polity2* variable.[21] The short run impact of this democratization would be to increase the amount spent on public education by 0.14% to 0.46% of national income. This would amount to an increase of between four and twelve percent in the educational expenditure of the average state in the dataset.

The long run effects are much more dramatic. To calculate these effects I use the following formula: $\beta/(1-\gamma)$, where β is the coefficient on *Polity2* and γ is the coefficient on the lagged dependent variable. This index is then multiplied by twenty in order to show the long run effects of moving between a total autocracy and a full democracy. As Table One shows, the estimated long run effect of full democratization is an increase in educational expenditure of between 0.81% and 1.23% of GDP. This would amount to between a twenty and thirty percent increase in the education budget of the average state in the data set. For states like China, which in 1998 spent just two percent of its budget on education, full democratization (in China's case from a score of -7 to 10) is predicted to lead to a between thirty and fifty-six percent increase in the educational budget—a shift of serious proportions.

The other control variables vary considerably in their magnitudes and statistical significance across the models, largely as a consequence of the differences in cross-sectional analysis between fixed effects models and OLS type models. GDP growth is positively related to educational expenditure, albeit with decreasing returns (a negative

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[21] This is a range similar in magnitude to the Portuguese democratization discussed below, which moved from a -9 score to a +10 score in the 1970s.

coefficient on the *squared log GDP* variable) in the fixed effects models but insignificant in the PCSE model. This implies that economic growth is a major explanatory effect behind educational expenditure within states, but different levels of development between states explain surprisingly little. The exact reverse results are obtained with regards to population, which is insignificant in the fixed effects models but statistically significant and negative in direction in the PCSE model. This in turn implies that population growth has little effect on educational expenditures once the proportion of under-fifteens is controlled for. However, large states appear to spend less proportionally on education than small states in a cross-national analysis—this seems likely to be a result of returns to scale in the provision of public goods. It should be noted that the ABOND method, which examines dynamic change through first differences, does find statistically significant results for *log GDP*, *squared log GDP* and *log population*, in the expected directions. This gives some credence to the suggestion that all the purported effects addressed above may well be present at once. On the other hand, government expenditure outside of education is generally insignificant, although positive in magnitude when it does obtain statistical significance.

The Effects of Democracy on Education: Portugal, Spain and the Philippines

The model above demonstrated a clear, significant effect of democracy on educational expenditure across 115 nations from 1960 to 2002. However, the precise mechanism at work becomes much clearer when we examine more closely states that underwent regime changes during the sample period. In this section I briefly examine three cases that amply demonstrate this process: Portugal, Spain, and the Philippines. These cases have been selected because they show considerable variation on the Polity

variable: ranges of, respectively, 19, 17 and 17. Educational expenditure has also gone through significant changes in these states: ranges of 4.6%, 4.6% and 4% of GDP. The Portuguese and Spanish examples of Iberian democratization show the expected increase in education following the fall of the Salazar and Franco regimes. The example of the Philippines is, perhaps, even more intriguing since it undergoes a relapse into autocracy in the early 1970s before re-democratizing following the fall of Marcos in 1986. What is particularly interesting is that educational expenditure neatly tracks this change in political representation.

Portugal

In the 1960s Portugal had arguably the most backward educational system in Western Europe. Indeed, it was not until the mid-1960s that the country made public education available to all children between the ages of six and twelve. Even then, under the Salazar regime implementation of education policies sorely lagged any legislative expansion of education, leading to endemic illiteracy. However, the death of Salazar in 1970 and the bloodless coup of 1974 that removed his successor Caetano led to the imposition of free elections and full democracy by 1980 in Portugal. In the decade before Salazar's death, public expenditure on education had averaged around 1.5% of GDP. However, following the coup educational expenditure hovered between 3.5% and 4% from the mid 1970s through to the 1990s when it climbed to around 5.5%, the OECD norm at the time. This second climb is partly due to the extension of compulsory education from six to nine years in the mid-1980s, which led to an increase in the

average years of education within the labor force of one full year between 1982 and 1992 (from five to six years).[22]

Examining the transition to democracy and its relation to economic policy in detail, an intriguing tale emerges. While Salazar had largely conceived of education as "teaching one's place in life," Caetano's education minister Veiga Simao (a Cambridge educated physicist) proposed the "democratization" of Portuguese education in 1972.[23] Veiga Simao deliberately modeled his proposed reforms on the standard OECD pattern, conceiving of education as human capital development rather than Salazarian indoctrination. Veiga Simao's reforms included an extension of compulsory education and the reform of higher education. Ironically, according to Stoer and Dale, these very reforms helped to sew the seeds of the regime's demise. Stoer and Dale note that these proposed reforms, intended to slow the drive to democracy and preserve the old regime by creating "organization without mobilization," instead "further stretched the credibility of the largely discredited principle of corporatism." While the Caetano regime did not survive 1974, Veiga Simao's unimplemented reforms were adopted by the new socialist left following the coup. The new socialist parties and groups did not stop with the Veiga Simao reforms: further steps were made to create nursery education, unify the secondary school system, ban child labor, and to provide study grants. The reforms of the 1980s (expanding the age of compulsory education to fourteen and increasing funding during the 1990s) were thus legacies not only of the transition to democracy itself but of the

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[22] Hartog and Vieira 1995. This second climb may also be the result of entering the European Union (see Section Four on the impact of economic integration on skills).

[23] Stoer and Dale 1987.

failed attempts of a fading autocracy to retain popular support. Figure Four shows the

relationship between democracy and education spending from 1960 to 2000 in Portugal.

Figure Four – The Effects of Democracy on Education Spending in Portugal
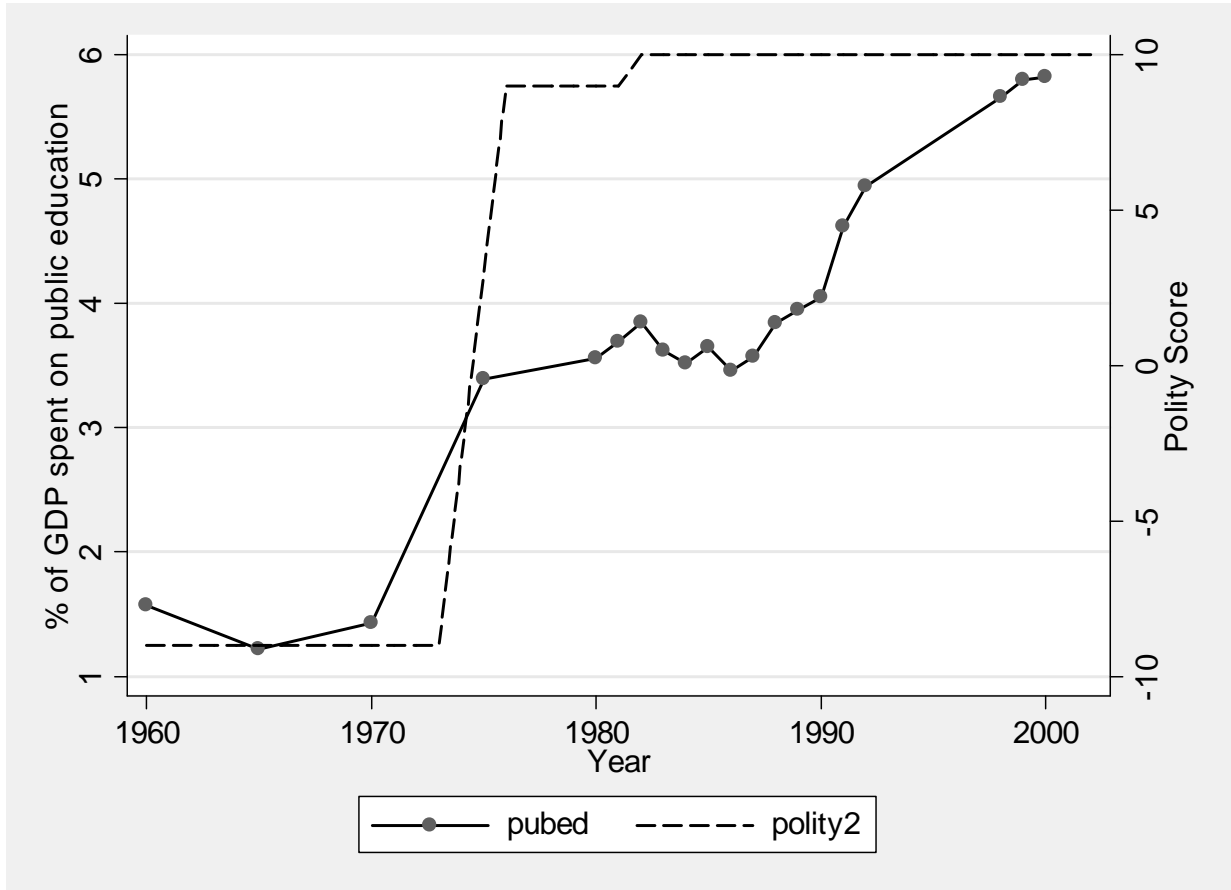
Spain

Like Portugal, Spain had its transition to democracy in the mid-1970s with the

death of Francisco Franco in 1975. Spain's expenditure on education prior to this

political change had been hardly higher than that of Portugal, somewhat under 2% of

GDP. However, as in the Portuguese case, following democratization this figure rose to

over 3% by the mid 1980s and to over 4.5% by the mid-1990s: a near-trebling of

expenditure. As in the Portuguese case, the floundering Franco regime attempted to

reform education in the early 1970s but was unable to implement reforms successfully or

to override the chief enemy of widespread public education: the church. Education in Spain until 1970 had largely been the preserve of the Catholic Church, which ran fee-paying schools with a very limited membership. Spanish education was extraordinarily stratified: in 1965, only 3% of working-age Spaniards had attended secondary schools, mostly the children of the upper middle class. The 1970 Education Act committed the state to public financing of education for all students, but this largely meant subsidization of the Catholic private school system as a result of the necessary political bargain between the government and the church, and little expansion was actually achieved.[24]

The state school system developed slowly along a separate track but funding was halting until the 1978 post-Franco constitution, which enshrined the right to secondary education, and then the two Socialist education bills, the Ley Orgánica del Derecho a la Educación (LODE) in 1985 and the Ley Orgánica de Ordinación General del Sistema Educativo (LOGSE) in 1990—the latter of which extended compulsory education to sixteen.[25] The quantitative effects of the passage of these laws were enormous in magnitude: there was a doubling of real expenditure per student contemporaneous with a major increase in enrollment (from fifty to seventy percent of 14-18 year olds attending school).[26] Again, as in the Portuguese case, while the authoritarian regime of the early 1970s gave a nod to human capital development (largely for technocratic economic reasons), it was not until the democratic regime emerged, and in particular the arrival of the Socialist Party, that the state began funding public education at a level even

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[24] O'Malley (1995) 27.

[25] Boyd-Barret 1995.

[26] Boix, Carles 1998.118.

approximating the Western European norm. Figure Five shows the pattern of democratization and education spending in Spain from 1965 to 2000.

Figure Five - **The Effects of Democracy on Education Spending in Spain**
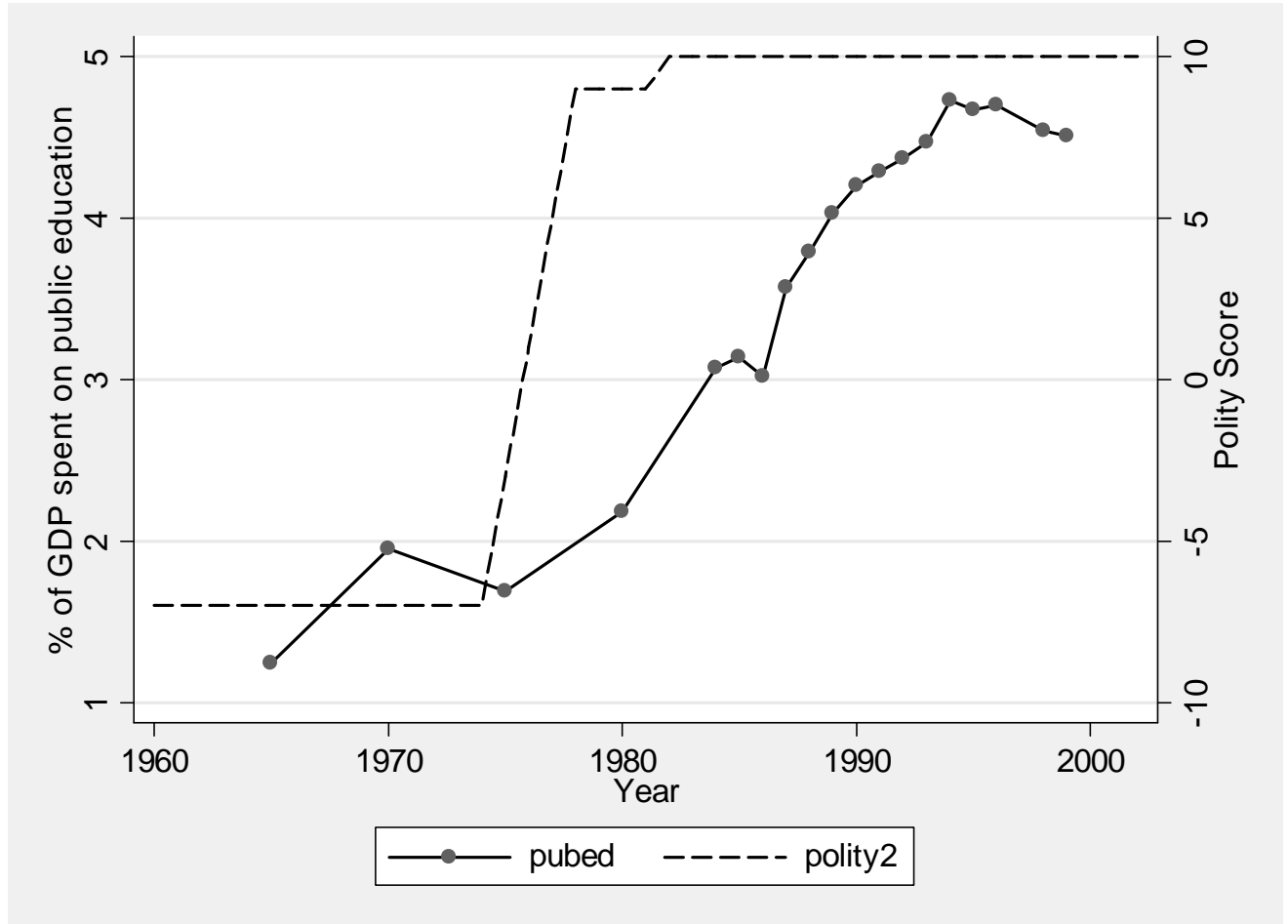
The Philippines

Whereas the Spanish and Portuguese experienced only an upward trend in democratization during the sample period, the Philippines experienced both autocratic restrictions and democratization during this time. During the 1960s, the Philippines had been a moderately democratic state, scoring 5 on the Polity index. By 1972, however, Ferdinand Marcos had seized power and this index had plummeted to -9. Contemporaneously, educational expenditure, which had been rising from 2.2% to 2.8%

of GDP before Marcos came to power, dropped sharply to below 2% for most of Marcos' rule. Although in the 1960s, the then democratically elected Marcos had expanded educational expenditure; this investment dropped sharply after his declaration of martial law in 1972. The steepest decline came in the early 1980s when the Filipino economy nosedived into a prolonged recession forcing major cutbacks in all areas of government investment. This budgetary collapse was largely the result of endemic corruption— money that had been channeled into the public sector was largely appropriated by the elites and consequently the percent of the population in poverty grew from 43.8% in 1971 to 58.9% in 1985.[27]

It was not until the late 1980s, after Marcos was forced to resign power, that educational expenditure recovered to its pre-1972 level, under the post-Marcos democracy of Corrazin Aquino and her successors. By 1998, educational expenditure had in fact tripled its late-Marcos level and climbed to over 4% of GDP, although it has dropped back subsequently to its late 1990s average of around 3.5% of GDP. This dramatic post-Marcos increase was largely a consequence of a key stipulation in the new Filipino constitution of 1987 that education should be the largest proportion of the state's budget. Indeed, the constitution stipulates that expenditure on education should be at least 6% of GDP, which has not proved to be a manageable target given the actual achievement of 3.5%, but it clearly demonstrates the determination of the new democratic government to specifically target education as a key policy device.[28] Figure

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[27] Congressional Budget Office (1997).

[28] It is also a useful confirmation that public education expenditure as a percentage of GDP is an appropriate dependent variable for the empirical analysis in this section, given that this variable was formally incorporated into the Filipino constitution.

Six demonstrates the relationship between education and democracy in the Philippines from 1960 to 2000.

Figure Six - **The Effects of Democracy on Education Spending in the Philippines**
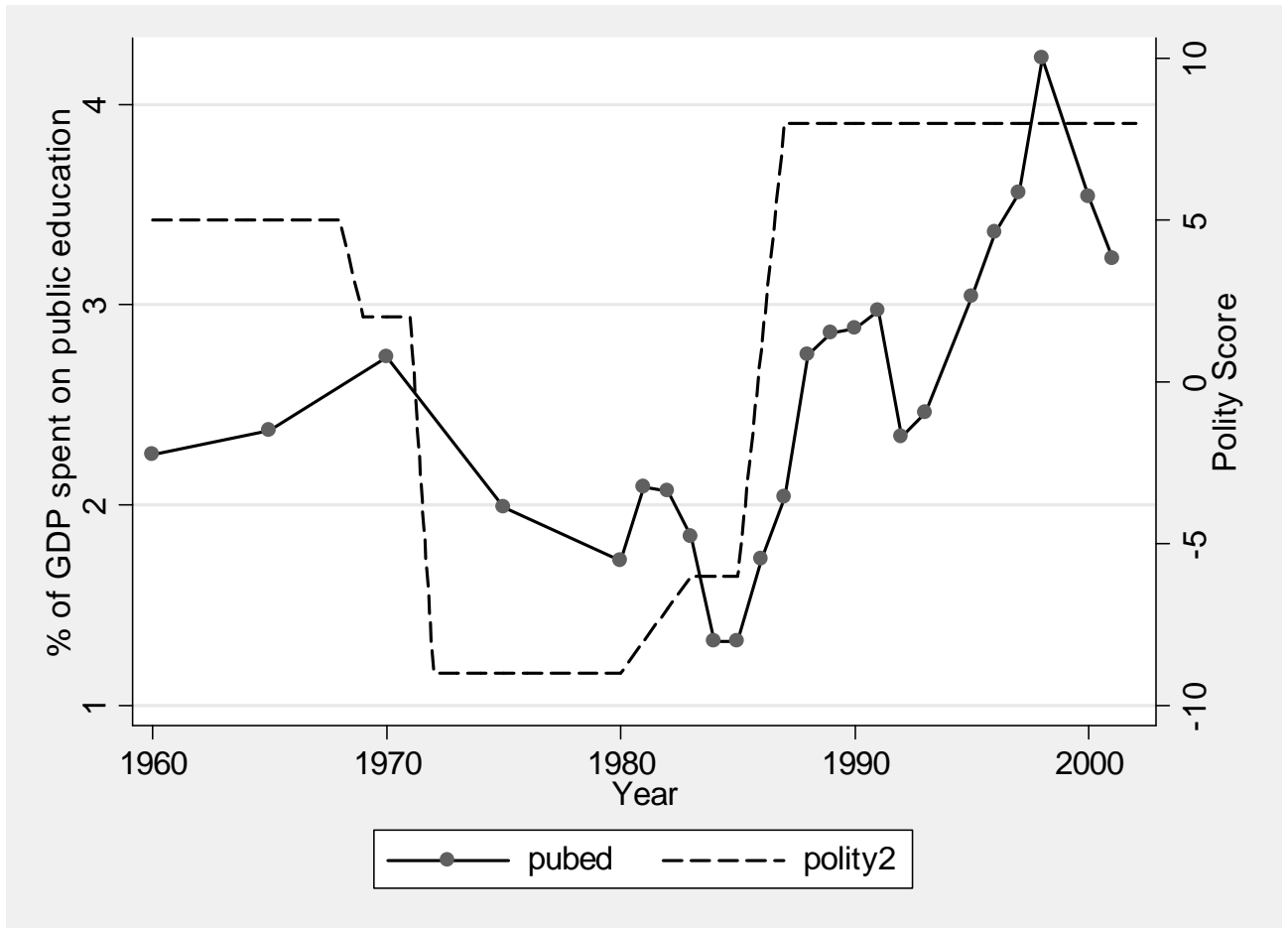
Section IV: Opening the Economy and the Effects of Economic Integration on Education

Our analysis so far has been limited to a closed economy state, in which the elite's relative control of the political system vis-à-vis the poor has been the key determinant of the level of human capital investment. Fortunately for the mass of society, the elite in most states cannot remain entirely divorced from the outside world. In particular,

economic integration means that a state's prices and hence factor returns are no longer entirely determined by domestic supply and demand. This result, as developed by Samuelson, is called the Factor Price Equalization theorem. Essentially, wages and other factor returns are derived from internationally uniform prices and are unrelated to the relative factor endowments of states. While shifts in domestic factor supply might change industrial structure, they no longer affect rates of return once prices are set globally.[29]

A key implication of the model laid out in Section Three was that individuals at the top of the skill distribution—the elite—would be unlikely to support an expansion of human capital provision because this would lower skilled wages through the supply effect. However, if skilled wages are set on global markets the impact of a change in domestic supply and factor returns is minimized. Global markets permit specialization, thus allowing states to have far higher human capital provision than they could maintain in an autarky. Moreover, although elites throughout the developing world may well not favor trade liberalization (because of the classic Stolper-Samuelson effect on their wages, as formulated by Rogowski), once they are in an open economy they are, nevertheless, more likely to favor human capital expansion than they would be in a closed economy.[32] Put differently, education is *less disadvantageous* to the elite in an open economy. In sum, greater integration with the international economy should lead to higher levels of human capital investment, all else equal. This proposition can be demonstrated formally.

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[29] The Factor Price Equalization comes from Samuelson 1948. The effects of factor supply changes on industrial structure is most commonly derived from the Rybczynski theorem (Feenstra 2004).

[32] Samuelson and Stolper 1941, Rogowski 1988.

Recall that the median voter's optimal human capital policy in a closed economy can be defined as:

$$S^*_{1med} = \frac{\bar{y}_0}{y_{med0}} \left[\frac{\delta}{k} \left(\frac{\partial p_{med}}{\partial S_1} [w_{S1} - w_{U1}] - bp_{med} + a(1 - p_{med}) + \frac{\partial g(S_1)}{\partial S_1} \right) \right]$$

The effects of skill supply on skilled and unskilled group wages are, respectively, *b* and *a*. If a citizen acquires the group skill in period one, this citizen faces the negative effect of increased skill supply. Expanding skill supply to other individuals lowers the returns to skilled citizens in round one by a coefficient *b*. Conversely, unskilled workers in round one actually benefit from human capital provision because it makes unskilled labor scarcer, an effect derived through coefficient *a*. However, opening the economy to global markets means, at the limit, domestic supply no longer affects skilled and unskilled wage returns. In the model, this can be seen by reducing *b* and *a* to zero:

$$S^{**}_{1med} = \frac{\bar{y}_0}{y_{med0}} \left[\frac{\delta}{k} \left(\frac{\partial p_{med}}{\partial S_1} [w_{S1} - w_{U1}] + \frac{\partial g(S_1)}{\partial S_1} \right) \right]$$

Provided that the median voter has a relatively high chance of benefiting from human capital investment (which seems likely given their median position on the skill distribution) and provided that the unskilled supply elasticity is not far larger than the skilled supply elasticity, this should lead to an increase in overall skill supply.[30] This change is also demonstrated in Figure Seven below as the move from *S** to *S***.

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[30] The latter assumption would also hold if skilled workers can perform unskilled tasks but not vice versa. This would, absent bargaining power, lead to a closed and open economy value of zero for *a*.

Figure Seven – The Effects of Opening to Trade

The extension of public education is thus unequivocally more preferable to the skilled in the open rather than the closed economy. If we assume that the median voter is either already skilled in round zero or likely to benefit from upskilling in round one, we can develop the following hypothesis:

H2: Increased economic openness should be positively associated with increased expenditure on public education as a proportion of national income

In order to check for robustness and because of the multi-faceted nature of opening the economy, I test this hypothesis using three different measures of economic integration. Firstly, I use the standard measure for openness used in the political economy literature on the effects of globalization on the size of government, exports plus imports over GDP, taken from the World Development Indicators dataset.[31] While this is the classic measure used in the field, it has a number of potential flaws in relation to this study. Firstly, the effect of opening the economy on domestic factor returns is unlikely to

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[31] This measure is used by, among others, Rodrik 1998, Adsera and Boix 2001, and Garrett 1998.

be linear: that is, moving from autarky to exports plus imports equaling ten percent of GDP (e.g. from Maoist China to 1960s Argentina) is likely to have a much stronger effect on factor returns than moving from 100 to 110 percent of GDP (e.g. from Holland to Belgium). Thus, in order to mitigate this effect I use the log of exports plus imports over GDP: *log openness*. Secondly, this variable is highly affected by the size of a state. The US has low levels of exports plus imports not because it is near-autarkic but because it is a continental-sized state that is largely self-sufficient. Equally, Angola has very high levels of exports and imports but is hardly a paradigm of globalization. To partially mitigate this problem, I control for population and GDP and, moreover, use country fixed effects, which absorb the idiosyncratic nature of countries like the USA.

Since trade openness is not an ideal measure, I also use two other variables. The first is a measure of the percentage of tax revenue that states derive from customs duties on imports. This provides a direct measure of one form of protectionism, since increasing prices at the border protects otherwise over-priced factors from global competition. I collected this measure from the World Development Indicators index and took its log to produce the variable *log duties*. There are, however, a number of potential pitfalls with this variable. Firstly, many poor states lack the bureaucratic capacity to manage an effective income tax system and hence are forced to rely on duties for tax revenues. Controlling for national income helps reduce this problem somewhat but it would be ideal to accompany this measure with a control for tax capacity. Secondly, duties are not the only way in which states can control trade: a vast variety of Non-Tariff Barriers (NTBs) exist, from quotas to voluntary export restraints to stringent product and labor regulations. Clearly, duties alone will not provide us with the whole picture.

To remedy this problem with NTBs and to avoid the problems that beset the classic exports/imports openness measure, I also test the impact of a variable created by Hiscox and Kastner that measures the distance of a state from its gravity-model predicted optimal level of trade.[32] This distance is then measured against an "ideal" standard of the Netherlands in 1964. As the authors put it, these measures "represent the percentage reduction in imports in each country year that is due to the deviation of trade policy from the 'free-trade' benchmark policies of the Netherlands in 1964." Critically, this measure examines the *outcome* of trade policies without having to measure each individual policy and find a method of weighting or aggregation. The Hiscox-Kastner measure comes in two forms, a basic country-year fixed effects model (BCFE) and an amended model (ACFE), where the amended form, used in this study, takes into account each state's relative factor abundance plus a measure for wealth.[33]

As in Model B in Table One, the statistical model used is a fixed effects model with the following regression equation:

$$Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \gamma Z_{i,t} + u_i + e_{i,t}.[34]$$

Using the fixed effects method seems most appropriate in that the formal model outlined above analyzes the effect in one state of moving from a closed to an open economy. The only difference from the democracy regressions in Section Four is that X is now a measure of openness rather than the Polity score. The Polity score is included as a control

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[32] Hiscox and Kastner 2002.

[33] All regressions were also conducted using the basic form with near identical results. Log versions were also used with similar results.

[34] PCSE and ABOND regressions were also conducted and produced substantively and statistically similar results to those obtained using a fixed effects regression.

variable in Models B, D, and F. Six models are presented in Table Two: the first two examine the effects of export/import openness; the second two examine the effects of the duty composition of taxation, and the final two use the Hiscox-Kastner measure.

Models A and B in Table Two show that export/import openness is predicted to have a substantial impact on public educational expenditure. The models predict that the effect of openness is substantial: moving from the fifth to the ninety-fifth percentile on the index is associated with a short-run increase in educational spending of between 0.46% and 0.54% of GDP. The long-run impact can be calculated as between 1.18% and 1.37% of GDP—this amounts to an increase in educational expenditure of nearly a third in the average country in the sample. The Polity variable, when included, is statistically significant and hardly affects the impact of openness. This implies that the effects of openness and democracy are additive rather than interactive: hence the presence of somewhat autocratic states with high openness and educational expenditure like Singapore and Malaysia and, conversely, the existence of relatively closed democracies with high educational spending like modern South Africa.[35]

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[35] I also tested a model incorporating an interactive variable multiplying each measure of openness by the Polity score. The coefficient on this variable was never statistically different from zero and did not significantly impact the coefficients or standard errors of the separate openness and Polity terms.

Table Two: Openness and Public Expenditure on Education

	MODEL A	MODEL B	MODEL C	MODEL D	MODEL E	MODEL F
LAGGED DV	.603 (.018)***	.608 (.018)***	.581 (.023)***	.573 (.023)***	.552 (.027)***	.552 (.027)***
LOGOPEN	.271 (.087)***	.232 (.089)***	-	-	-	-
LOG DUTIES	-	-	-.061 (.037)*	-.074 (.037)**	-	-
HISCOX / KASTNER	-	-	-	-	-.036 (.007)***	-.034 (.008)***
POLITY	-	.012 (.005)**	-	.021 (.006)***	-	.012 (.007)*
POP<15	-.015 (.011)	-.015 (.011)	-.016 (.013)	.018 (.014)	.042 (.017)**	.042 (.018)**
LOG (GDP)	2.245 (.821)***	2.180 (.833)***	2.845 (1.133)**	2.684 (1.151)**	1.898 (1.419)	2.024 (1.421)
LOG (GDP) SQ	-.044 (.017)***	-.041 (.017)**	-.059 (.023)**	-.053 (.024)**	-.034 (.029)	-.036 (.029)
LOG (POP)	.007 (.224)	-.012 (.225)	.335 (.341)	.288 (.340)	-.262 (.344)	-.293 (.344)
GOVT EXP	.002 (.006)	.003 (.006)	.006 (.009)	.010 (.009)	.022 (.011)*	.027 (.012)**
YEAR	-.012 (.006)**	-.016 (.006)***	-.005 (.008)	-.014 (.008)	.006 (.010)	.002 (.010)
N / STATES	1528 / 114	1501 / 113	1091 / 98	1068 / 96	771 / 62	756 / 61
ADJ. R SQ	.894	.896	.906	.908	.905	.908
Short Run FD	+ 0.46***	+ 0.54***	- 0.37*	- 0.44**	- 1.26***	- 1.19***
Long Run FD	+ 1.18***	+ 1.37***	- 0.87*	- 1.04**	- 2.81***	- 2.66***

All models use state fixed effects. Standard errors in parentheses * = $p < 0.1$, ** = $p < 0.05$, *** = $p < 0.01$

Models C and D incorporate the *log duties* variable. This time, as expected, the coefficient is strongly negative because greater protectionism should be associated with reduced education spending. In Model C the *log duties* variable is only statistically significant at the ten percent level, but once the Polity measure has been included the estimated magnitude and statistical significance of the coefficient increase somewhat. Model D implies a short run decrease in educational expenditure of 0.44% of GDP and a long run decrease of 1.04% of GDP following a move from the fifth to the ninety-fifth percentile on the *log duties* scale, very similar in magnitude to the same shift on the *log openness* index.

Models E and F demonstrate the effect of incorporating the Hiscox-Kastner amended trade-orientation variable, which is statistically significant at the one percent level, although the dataset is reduced to sixty-two countries and the time range to between 1960 and 1992. The predicted effect of moving from the fifth to the ninety-fifth percentile on the Hiscox-Kastner index is a drop in educational spending of 1.26% of GDP in the short run and 2.81% of GDP in the long run, implying a substantively vast impact of restrictions on trade. This implies that were China to become as "trade-friendly" as West Germany, this would be associated with a long run increase of 140% in its educational expenditure. The coefficient on *Polity2* is identical to that obtained in the *log openness* analysis, albeit with a lower level of significance because of the reduced dataset.

How Openness Effects Education: An Illustration in South Asia

The results obtained above point to a powerful impact of globalization on educational expenditure. However, without concrete cases to match them to, this analysis

remains abstract. I now present a brief analysis of how this pattern played out in four South Asian states: Bangladesh, India, Malaysia and Thailand.[36] These four states vary a great deal in their level of openness to the international economy. While all four have become increasingly open since 1960, they have done so from very different starting points. Over the period of the sample there is a clear distinction between the relatively closed economies of Bangladesh and India and the more open economies of Malaysia and Thailand. For example, their mean levels of exports plus imports over GDP across the sample period differ by an order of magnitude: Bangladesh's average is 22.2% and India scores 15.2%, whereas Thailand has an openness level of 59.3% and Malaysia the extreme of 121% of GDP. This variation shows up across the other measures as well. In terms of the percentage of taxes collected in duties, Bangladesh scores 30%, India, 28%, Malaysia 15%, and Thailand 11% in 1999. Finally, the Hiscox-Kastner dataset also displays this significant variation (although it excludes Bangladesh): India receives a mean BCFE score of 49.4 (where zero represents the Netherlands in 1964), whereas Thailand scores 34.0 and Malaysia scores 30.9.

Thus across the range of measures of openness used in the data analysis above these states differ substantially. Yet this range of variation is perhaps somewhat surprising. The countries are all neighbors along the Eastern coast of the Indian Ocean. Three out of four were British colonies in the early part of the twentieth century. None

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[36] These states are also incorporated in Peter Lindert's analysis on the effects of elite bias on educational composition, which suggests that the Indian bias toward tertiary education and their low overall levels of educational expenditure are a result of the anti-democratic nature of the caste system and one party rule. My analysis suggests a different explanation of the Indian paradox: its lack of openness to the international economy, which has enabled the elite to gather scarcity rents from their education. Lindert 2004. 48-50.

was particularly wealthy in 1960—all had a GDP per capita below $1000 dollars (in 1995 $US), less than half the average Latin American GDP per capita at the time. Although India obviously had a population and area dwarfing the other states, this hardly explains the enigma of Bangladeshi under-education vis-à-vis Malaysia and Thailand. In fact, except for a couple of years at the end of the 1980s, India and Bangladesh have not had rates of public education higher than Thailand and Malaysia across the entire sample period.

Focusing on the Malaysian/Indian comparison, it should be noted how the Malaysians have made mass education a critical element of their overall economic strategy. The two-decade New Economic Program (1970 to 1990) in Malaysia and the New Development Program established in 1991 both had as a key aim the development of "a strong human resource orientation in order to be internationally competitive during the process of industrialization."[37] Indian development, conversely, was focused on developing domestic import-substituting industries, largely controlled by the political elites. The success of such industries depended rather more on easy access to import licenses and official corruption than on internationally competitive human capital. Even today, in a more open India, with its software engineers fully integrated into the international economy, mass education remains fragmented and piecemeal: in the 1990s nearly half of all Indian adults remained illiterate.[38] Figure Eight below demonstrates the varied paths of Bangladesh, India, Malaysia and Thailand with regard to educational expenditure since 1960. The bottom left point for each state represents their level of

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[37] Mukherjee and Singh 1995. 183.

[38] Lindert 2004. 47.

openness and public education in 1960 and the subsequent years are connected. It is apparent from the figure that the relationship between openness and education has been extremely close over this period, both within these states and between them.

Figure Eight – Openness and Public Educational Expenditure in South East Asia
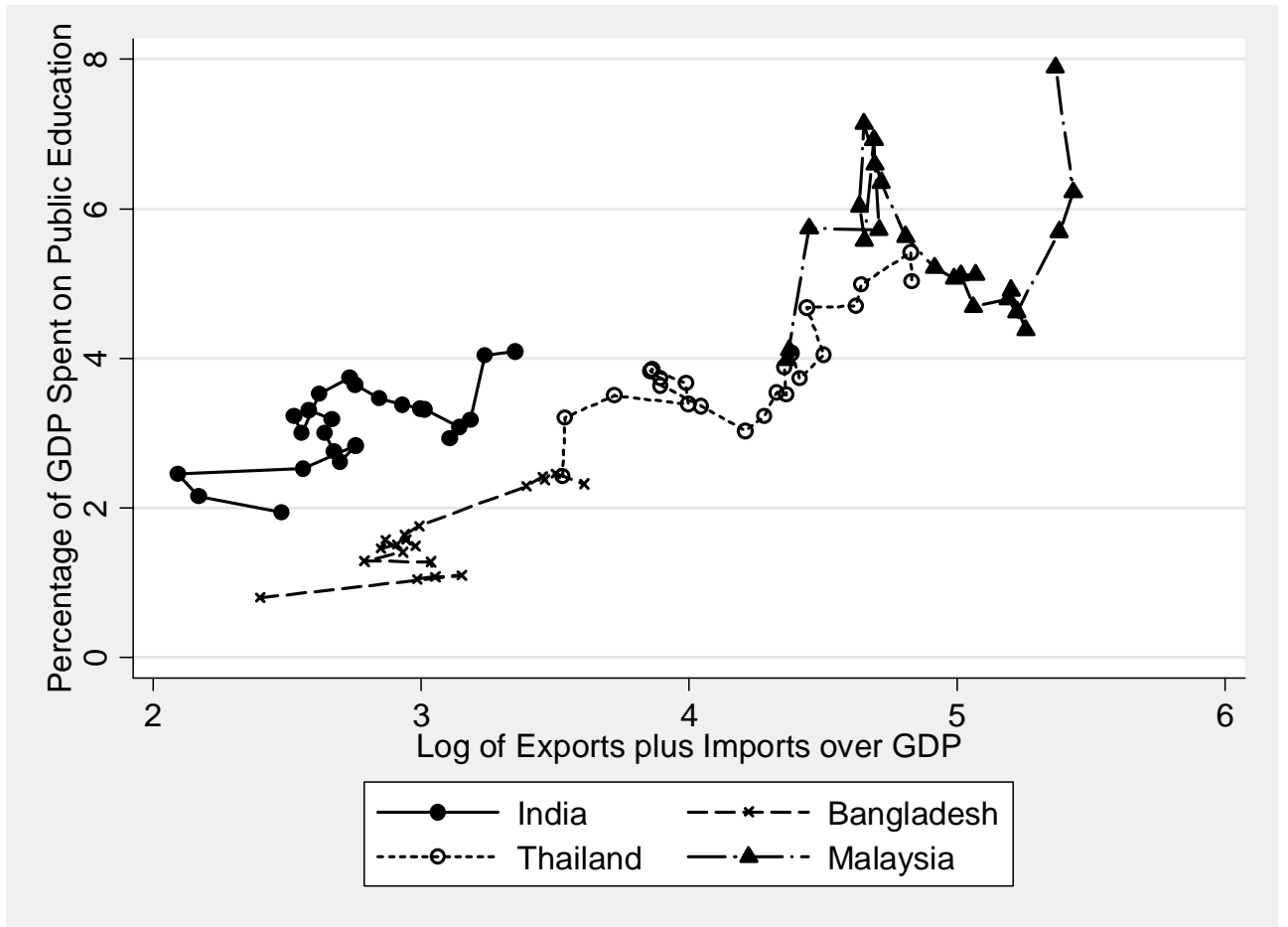
Section V: Conclusion

Public provision of education is not merely the provision of a merit good; it has the capacity to fundamentally alter the distribution of income in society in the future. This paper has sought to show that these very real distributional implications are greatly affected by a country's political institutions and their position in the international economy. Political institutions determine *whose* vote counts more, as such, when they systematically favor the most skilled it is likely that provision of further skills through public education will be relatively low. The skilled have a strong incentive to maintain their dominant position: a position that is likely to be significantly weakened through the expansion of skills because of the decreased scarcity of skilled workers. As the franchise expands to include unskilled individuals, whose families stand to directly benefit from upskilling, the likelihood of increased public investment in human capital becomes ever higher. Following this logic, statistical analysis of 115 states across the past four decades demonstrates a clear association between the level of democracy of a state and its level of human capital investment—moving from democracy to autocracy leads to a predicted twenty to thirty percent expansion in average educational investment in the long run. This magnitude appears even greater when one considers specific cases of democratization. The histories of Portugal, Spain and the Philippines amply demonstrate the potential of democratization to lead to revolutions in educational expenditure.

A state's position within the international economy determines the returns to skill and thus alters the framework of incentives facing citizens. Skilled individuals in a globalizing state are less affected by increased skill provision than they would be in an autarky. Their wages are no longer set purely by domestic demand and supply, hence

shifts in domestic supply have a much reduced impact on skilled wages. Because open states can specialize within the global economy, the possibility of a high-skill equilibrium state becomes realizable. Statistical analysis of this proposition showed some dramatic results. Moving from an autarky to the most highly open economy can lead to a long run increase of thirty to seventy in the average educational expenditure. The case comparison of Bangladesh and India to Thailand and Malaysia provides a sharp contrast of closed to open economies in South Asia. It suggests that the famed failure of Indian education to expand beyond elite provision may be a result of India's relative seclusion from the global economy. Conversely, the great success of the South East Asian tigers demonstrates the comity between open markets and high levels of educational spending.

An analysis of these broad measures of political institutions and globalization is only a first start in developing a political economy of human capital. Democracy and openness are perhaps unwieldy instruments with which to analyze effects on education. Perhaps disaggregating these variables into more refined categories would provide extra traction on the questions at hand. Do presidential systems lead to higher human capital provision than parliamentary ones? What is the role of federalism on such expenditure? Would other measures of openness like foreign direct investment help fill out the puzzle of why globalization appears associated with increased investment in education? These questions are critical future steps in the research of "future redistribution". Nonetheless, this paper demonstrates that, at the broadest level, open polities and open economies lead to the opening up of education to the masses.

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