Debt Relief and Education in HIPCs*

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Abstract

In this paper we assess the effect of debt relief received at the decision and completion points of the HIPC Initiative on educational variables. We analyse the existence of significant changes in the size of educational expenditures, drop-out rates in primary schooling, repetition rates in secondary schooling and pupil-to-teacher ratios. Using propensity score matching and Heckman's maximum likelihood approach to assess the potential sample selection problem, we find significant decreases in primary schooling drop-out rates after a HIPC has reached its completion point. This positive development in educational attainment is not mirrored in increases of education expenditures from the side of governments.

Keywords: Development, debt relief, human capital, education.

JEL classification: I20, I28, F34

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1 Introduction

With the launch of the Heavily Indebted Poor Countries (HIPC) Initiative in 1996, debt relief efforts by a wide range of creditors (multilateral, bilateral, and commercial) were directed specifically towards poor countries struggling to cope with external debt that placed significant burden on export earnings or fiscal revenues. Further modifications in 1999 were approved to the Initiative to provide faster, broader, and deeper debt relief and to strengthen the links between debt relief, poverty reduction, and social policies. Moreover, in 2005, the HIPC Initiative was supplemented by the Multilateral Debt Relief Initiative (MDRI) to help accelerate countries' progress toward the United Nations Millennium Development Goals (MDGs).[1] These two major debt relief efforts by the international community have helped reduce significantly the debt burden of HIPCs and have released resources for poverty-reducing and social expenditures. The absence of comparable data (see Depetris Chauvin and Kraay, 2005 and Depetris Chauvin and Kraay, 2007) on the present value of external debt for developing countries partly explains the relatively late birth of the branch of literature studying the economic effects of debt relief, which has delivered mainly disappointing results concerning the macroeconomic effects of such aid strategies. Depetris Chauvin and Kraay (2005) find practically no evidence that debt relief has had an impact on economic growth, investment rates or public spending.

Although the literature suggests that debt relief may have an effect on human capital accumulation (and in particular, on educational outcomes), no convincing empirical evidence exists on the link between debt relief and education. Nafula (2002), for instance, concentrates on the case of Kenya and stresses the fact that, as long as debt relief frees resources for education provision, debt relief may be an important instrument for reaching the Millenium Development Goal of universal primary education. From a theoretical point of view, Easterly (2002) hinges upon the potential effects that debt relief may have on the discount factor of governments. To the extent that debt relief programs are succesful in inducing a reduction in the discount factor of governments (and thus in the optimal tax rate) in developing countries, human capital accumulation may be directly affected by the debt relief decision.[2]

In this contribution we assess empirically the effect of debt relief provided at the HIPC Initiative decision and completion points on educational variables within HIPCs. In particular, we test for statistical differences in changes in educational expenditures, pupil-to-teacher ratios and drop-out and repetition rates between countries which reached debt relief decision or completion points and other eligible HIPCs. Since HIPC Initiative debt relief decision and completion points do not necessarily constitute a randomized experiment, we control for the potential sample selection problem using matching

[1] The MDRI allows for a cancellation of eligible debts by three multilateral institutions: the IMF, the International Development Association (IDA) of the World Bank, and the African Development Fund (AfDF) for countries reaching completion point under the HIPC Initiative process. In 2007, the Inter-American Development Bank (IADB) also decided to cancel eligible debts of the five HIPCs in the Western Hemisphere in an initiative similar to the MDRI.

[2] See King and Rebelo (1990) for an economic growth model with taxation and human capital accumulation.

estimates based on propensity scores and Heckman's (1979) sample selection estimator. Our results do not give evidence of any significant effect of reaching the HIPC Initiative decision point on human capital accumulation variables. Reaching completion point, on the other hand, seems to be associated with lower drop-out rates in primary education. These results shed a light on the mechanisms triggered by debt relief on human capital accumulation, and reinforce the results reported in Crespo Cuaresma and Vincelette (2008), who find an increase in the long-run level of primary school attainment for young cohorts in countries that reach the decision point of the HIPC Initiative.

The paper is structured as follows. Section 2 presents descriptive statistics on educational variables for HIPCs, the testing procedures for differences in educational outcomes between subgroups of HIPCs and their results are presented in Section 3. Section 4 concludes.

2 Debt relief and education: Descriptive statistics

We aim at assessing the effect of a country reaching the HIPC Initiative decision and completion points on educational attainment and expenditure. A first descriptive approach to aprehend such a task would imply comparing the outcome of educational variables between HIPCs before and after their decision points, eventually adding to the group of observations *"before decision point"* those of HIPCs which have not yet reached their decision point. Similarly, the effect of reaching the completion point can be assessed by examining the differences between the observations after reaching completion and those before completion within the group of 33 HIPCs which have reached the decision point.

We present the descriptive statistics of various educational measures for the full group of 41 HIPCs, for the group of 33 HIPCs which have reached decision point and for the group of 23 HIPCs which have reached completion point. The statistics refer to yearly data for the period 1998-2005 on the following educational variables:[3]

- public expenditure on education as percentage of GDP ($EXPED/GDP$),
- public expenditure on education as percentage of total government expenditure ($EXPED/TOTEXP$),
- public expenditure on primary education as percentage of public expenditure on education ($EXPED1/EXPED$),

[3]The dataset is not balanced, and the number of missing observations varies across countries and variables. The following countries are included in the sample: Benin, Bolivia, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Guyana, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nepal, Nicaragua, Niger, Rwanda, Sao Tome and Principe, Senegal, Sudan, Tanzania, Togo, Uganda and Zambia. The source of all educational data is the World Bank. It should be noticed that, although the HIPC Initiative was launched in 1996, no country reached decision point before 2000.

- public expenditure on secondary education as percentage of public expenditure on education ($EXPED2/EXPED$),
- public expenditure on tertiary education as percentage of public expenditure on education ($EXPED3/EXPED$),
- drop-out rate, primary education ($DORPRIM$),
- repetition rate, secondary education ($REPSEC$),
- pupil-to-teacher ratio, secondary education ($PTRSEC$).

Table 1 presents descriptive statistics on these variables and their yearly change for the group of HIPCs, as well as for the subsamples of country-year observations preceding and following each country's HIPC Initiative decision point. Table 2 presents similar information creating subsamples from the observations after decision point, depending on whether completion has taken place or not. Post-decision countries have on average higher levels of educational expenditure (over GDP) and in particular the ratio of expenditures in primary education to total educational expenditure is higher than in pre-decision countries. On the other hand, post-completion countries present higher levels of educational expenditure and lower drop-out and repetition rates. There is, however, a large variation across country/year observations, as measured by the standard deviation and the difference between maximum and minimum values of the education variables.

We will concentrate on assessing significant differences between HIPCs having reached the decision point and those that have not availed themselves of the Initiative, as well as differences between countries beyond the completion point and those not having reached the completion point within the group of countries beyond the decision point. The standard statistical tests for the equality of changes in these variables across groups of observations are presented in Table 3. The significance of a HIPC reaching its decision point lies in the commitment to pursue a set of agreed floating completion point triggers. This very commitment to reform is usually translated in the implementation of a government-owned poverty reducing strategy (PRS) and maintaining macroeconomic stability, among others. Reforms in the health and education sectors have become cornerstones of PRSs. For countries having reached the decision point, significant differences are present for the change in the share of educational expenditures over total public expenditure and for the change in the share of educational expenditures in primary education over total educational expenditures. On average, post-decision-point HIPCs have significantly increased educational expenditure more than pre-decision-point countries, but reduced more primary schooling expenditures within total educational expenditures. This last result is however heavily influenced by a single observation (Madagascar 2001), and give the small sample size for this variable should not be interpreted as robust evidence.

At the completion point, upon reaching the floating completion point triggers, HIPCs receive irrevocable HIPC Initiative debt relief and become eligible for a debt stock reduction under the MDRI, with the objective to relieve debt service obligations and create fiscal space for poverty-reducing expenditures, including in the health and education sectors.

For the case of post-completion-point observations, the only change which is marginally significant refers to the fact that post-completion point countries have reduced drop-out rates in primary schooling more than interim countries. For these results to be interpretable in the causal sense, it must be the case that the assignment of debt relief be random across countries. To the extent that countries reaching decision or completion point possess (observable or unobservable) characteristics which may have affected their speed of human capital accumulation and the probability of reaching decision or completion point simultaneously, the statistics presented in Table 3 cannot be interpreted as causal links between debt relief and human capital accumulation. This setting resembles that of the quantification of treatment effects in medical studies and policy assesment. In the next section we use adequate statistical methods to assess the potential sample selectivity in our data.

3 The effects of reaching decision and completion points on education

3.1 Methodological background

In order to explicitly assess the potential endogeneity of the treatments (decision and completion), we will implement two types of estimators: propensity score matching estimators (Rosenbaum and Rubin, 1983) and Heckman's (1979) full maximum likelihood procedure.

The econometric setting of the problem is the following: We are interested on the effects of, say, HIPCs reaching decision point on the change in educational variable y, eventually after controlling for a vector of covariates, $\mathbf{x}$,

$$\Delta y_{it} = \alpha + \tilde{\alpha} d_{it} + \beta \mathbf{x}_{it} + \varepsilon_{it}, \tag{1}$$

where d_{it} is a binary variable taking value one if country i is beyond decision point at time t and zero otherwise, β is a vector of parameters and ε_{it} is the error term. The effect of reaching the decision point on Δy is thus summarized in $\tilde{\alpha}$. The sample selection problem refers to the fact that treatments (d_{it}=1) may not be randomly assigned to the sample of country/observations at hand. In particular, we can assume that treatment assignment depends on a set of independent variables $\mathbf{z}_{it}$,

$$\delta^*_{it} = \gamma \mathbf{z}_{it} + \nu_{it}, \tag{2}$$

where d_{it}=1 if $\delta^*_{it} > 0$ and ν_{it} is a random shock, potentially correlated with ε_{it}, with correlation coefficient equal to ρ.

The main idea behind matching estimators is to identify pairs of observations sharing similar characteristics concerning the probability of being selected for the treatment (that is, being past decision or completion point at the HIPC Initiative), but which differ in the fact that one of them belongs to a treated observation, while the other is in the control group. The propensity score matching method builds groups of country/year observations which are as similar as possible in terms of the probability of being treated and performs the comparison based on these matched observations. The procedure is carried out by estimating the binary dependent variable implied by (2) and choosing matched pairs based on the estimated probability of treatment (the propensity score).

There are different methodologies aimed at defining the "closeness" of two observations. *Nearest-neighbour matching* is obtained by choosing pairs of observations which minimize the absolute difference in propensity scores. The average treatment effect, AT, that is, the difference in the educational variable between treated units and control units, can thus be generally computed as

$$AT_{\Delta y} = \frac{1}{N_T} \sum_{i \in G} \Delta y_i^G - \frac{1}{N_T} \sum_{j \in C} \omega_j \Delta y_j^C,$$

where N_T is the number of treated observations (namely, the number of country/year observations corresponding to post-decision or post-completion periods), Δy_i^G and Δy_i^C are observed educational outcomes corresponding to the treated and non-treated units, respectively and ω_j is a weight corresponding to the inverse of the number of units matched with each one of the treated units. In other words, the methodology compares the educational variable changes for country/year observations for HICPs past the completion/decision point and those before the completion/decision point sharing similar characteristics. These characteristics, on the other hand, are to be understood in terms of those factors which determine the occurrence of the decision/completion point.

Heckman's (1979) procedure combines the estimation of the selection (binary) and outcome equation in a single system. Heckman's (1979) procedure estimates (1) and (2) as a system of equations using maximum likelihood estimation methods, and allows us to directly interpret the estimate of $\tilde{\alpha}$.

3.2 Empirical results

The results of the propensity score matching estimates are presented in Table 4 and Table 5. The analysis is carried out exclusively on the change of educational expenditures as a percentage of GDP ($\Delta(EDEXP/GDP)$), the change in primary schooling drop-out rates ($\Delta(DORPRIM)$), the change in repetition rates in secondary schooling ($\Delta(REPSEC)$) and the change in the pupil-to-teacher ratio ($\Delta(PTRAT)$), since too few observations are available from the other educational measures. We tried several specifications for the selection equation, using various institutional and macroeconomic variables.[4] The model chosen for the post-decision point selection includes the civil liberties index, obtained from the Freedom House, in order to proxy the quality of democratic institutions, net aid transfers per capita (in logs), inflation, GDP per capita (in logs) and its growth rate and a dummy variable indicating the existence of armed conflict for a given country/year observation.[5] In order to avoid to

[4]Apart from those covariates in the specifications shown in the tables, also variables for debt stock and service, as well as country size variables were included in the model but did not improve the fit.

[5]The source of these data is the World Bank.

a certain extent the problem of endogeneity the explanatory variables are lagged by one year. The resulting models have high pseudo R-squared values and give us an interesting insight to the process of selection into the different stages of the HIPC Initiative.

Our results reinforce those of Freytag and Pehnelt (2008) concerning the fact that governance quality did not play a significant role in the process of reaching decision point among HIPCs. The civil liberties index does not appear to be a statistically significant covariate in the models estimated for any of the subsamples defined by the existing data on educational variables. In some sense, it is not surprising that governance is not found to significantly influence countrys ability to reach the decision point of the HIPC Initiative, given that at this stage of the Initiative a country agrees on a set of completion-point triggers and makes a commitment to pursue those. There is a strong signaling to the international community of the intention of the HIPC to reform, including its governance institutions. The results for the other variables indicate that the event of reaching the decision point is more likely for countries recieving higher levels of net aid. It should be noticed that the sheer size of foreign aid flows to HIPCs serves as a strong signal of the governments commitment to pursue reforms and the international community willingness to support those reforms and in this sense net aid flows serve as a predictor of the arrival of decision (and completion) point. Reaching the decision point appears also more likely where armed conflict is not present. Price stability as a factor of debt relief decision appears marginally significant for the subsample defined by the existence of drop-out-rates data, and countries achieving decision point tend to have lower rates of income growth. While this last result may look counterintuitive, it seems to be driven exclusively by the fastest growing observations in the sample. Reestimating the model only for observations corresponding to growth rates of income smaller than 5% reduces the sample by only four observations and renders estimates for the effect of income growth which are statistically insignificant,[6] leaving the conclusions below qualitatively unchanged.

We obtained matching estimates by comparing each single country/time observation after the decision point with a corresponding control group formed by groups of pre-decision point country/time observation of size ranging from one to five, and the results are presented in the top part of Table 4. We used only post-decision point observations with propensity scores in the range defined by the minimum and maximum of the propensity scores of the control group, so as to avoid that our results are driven by single, non representative treated subjects. The results robustly indicate no significant differences with respect to educational variables induced by HIPCs reaching the decision point. Given that at the decision point HIPC governments solely commit to implementing their PRSs, frequently with notable human development element, it is to a certain extent not surprising that the effects are not visible in the data for countries at this stage of the Initiative.

Table 5 presents a similar exercise for completion point HIPCs. The selection model includes now other variables which appeared significantly related to the event of reaching

[6]For the subsamples used in the estimations, the observations corresponding to the highest growth rates of income tend to correspond to Ethiopia, Mozambique and Nicaragua.

the completion point: country size and the time ellapsed since decision point was reached. Our results indicate that larger countries tend to have higher probabilities of reaching completion point faster, and that the probability of reaching the completion point increases with the time ellapsed since the decision point. This covariate allows us to compare in the matching estimator observations corresponding to interim countries in relatively similar stages of the Initiative, so as to control for effects on educational variables which may have been triggered by the decision point but only affect human capital accumulation with a certain lag.

The matching estimates for the effect of reaching the completion point are presented in the top of Table 5 and give evidence of significant decreases in drop-out-rates for primary schooling in countries after completion takes place. The result is robust to the size of the control group and larger than the unmatched estimate obtained with a simple (unmatched) comparison of the treated and control group. Specifically, drop-out rates have declined on average by 5.4 to 9.3 percent in the period after the completion point compared to the average rates of 42.8 percent for HIPCs in the interim period.

Table 6 presents the results of the models using the Heckman estimator. We used similar variables for the selection equation as in the case of the matching estimators, and present estimates for two specifications of the treatment equation. In the simplest model, corresponding to the first column for each one of the educational variables in Table 6 we compare the average outcome of decision/pre-decision groups or completion/pre-completion groups, as in the case of the matching estimator. For all cases, we also present the result of the test for independence of the selection and treatment equations ($\rho = 0$). The results indicate no significant selection bias for post-decision point HIPCs for all variables with the exception of the subsample for the comparison of changes in pupil-to-teacher ratios. Significant effects triggered by decision point are not found for any of the educational variables. For the case of completion points, more evidence of sample selection is present in the subsamples, in particular in repetition rates and educational expenditures. The results for these variables indicate that significant decreases took place after completion point.

Additionally, in the second column for each variable we also control for potential convergence dynamics in educational variables which may be independent of the selection process using as an extra covariate the lagged value of the educational variable (in levels) in (1), as is standard in the income convergence literature. The results are not affected by accounting for potential convergence of educational measures.

Putting the results of both exercises together, we find a ignificant decrease in drop-out rates after the completion point, with estimates of the quantitative effect ranging from around 5 to around 9 percentage points. Figure 1 presents the graphical representation of the average change in drop-out rates at completion point and on the two years preceding and following this event for the sample in our analysis. The effect appears robust across estimation methods. Significant decreases in the repetition rates are also observed in some specifications, although this result does not appear robust across methods. The same applies to differences in educational expenditures and pupil to teacher ratios.

4 Conclusions

We present evidence concerning the effects of reaching decision and completion point in the HIPC Initiative on educational variables. The results give evidence that, although educational expenditures from the side of the government do not tend to increase after decision or completion point, primary schooling drop-out rates decrease significantly after completion point is reached. No significant effects are found after decision point is reached, however, although the lag with which such human capital gains are realized may explain the absence of some of these mechanisms.

The results shed a light on the factor accumulation mechanisms triggered by debt relief by concentrating on the case of human capital accumulation in developing countries. This study complements the analysis put forward in Crespo Cuaresma and Vincelette (2008), where the effects of debt relief on human capital accumulation for young cohorts are analyzed.

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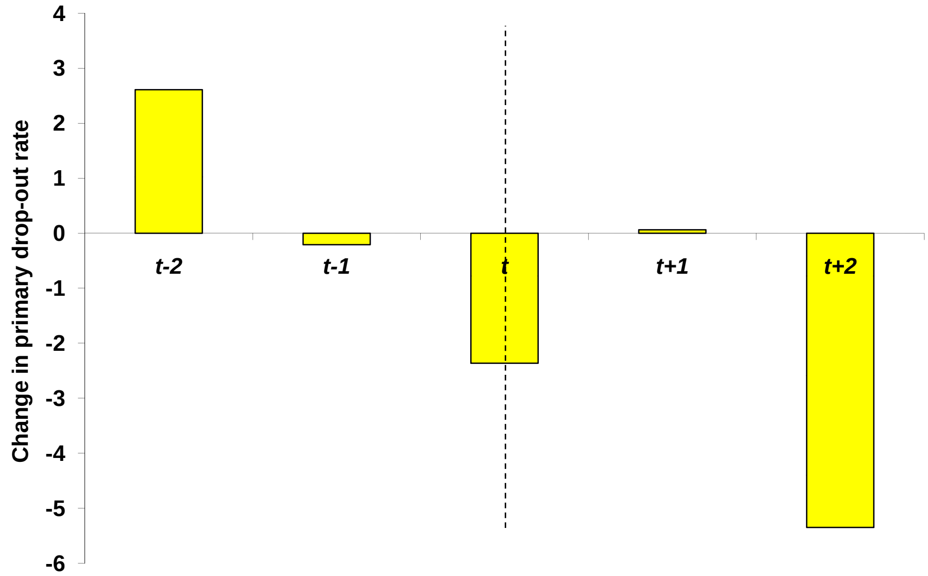

Figure 1: Primary schooling drop-out rates, interim countries and post-completion point countries

Full HIPC sample					
Variable	Obs.	Mean	Std. Dev.	Min	Max
$EDEXP/GDP$	124	3.75	1.52	1.00	8.80
$EDEXP/TOTEXP$	57	16.41	4.74	6.40	26.20
$EDEXP1/EDEXP$	72	45.68	9.09	23.10	63.90
$EDEXP2/EDEXP$	66	27.48	6.78	7.80	41.20
$EDEXP3/EDEXP$	66	19.00	7.02	3.30	34.70
$DORPRIM$	114	38.78	16.42	4.70	72.80
$REPSEC$	186	16.85	8.79	1.40	36.10
$PTRAT$	127	28.37	9.95	11.30	54.00
$\Delta(EDEXP/GDP)$	81	0.01	0.56	-1.80	1.60
$\Delta(EDEXP/TOTEXP)$	30	0.13	2.91	-8.20	7.40
$\Delta(EDEXP1/EDEXP)$	41	0.44	3.97	-6.80	9.40
$\Delta(EDEXP2/EDEXP)$	35	-0.54	3.26	-8.30	4.40
$\Delta(EDEXP3/EDEXP)$	35	-0.65	3.33	-7.10	9.70
$\Delta(DORPRIM)$	78	-0.48	11.60	-32.00	34.80
$\Delta(REPSEC)$	142	-0.38	3.04	-19.60	14.50
$\Delta(PTRAT)$	86	0.82	3.13	-5.70	16.30
Pre-decision point subsample					
	Obs	Mean	Std. Dev.	Min	Max
$EDEXP/GDP$	72	3.60	1.35	1.00	8.80
$EDEXP/TOTEXP$	35	16.59	5.39	6.40	26.20
$EDEXP1/EDEXP$	46	44.56	9.41	23.10	63.20
$EDEXP2/EDEXP$	42	29.26	6.76	7.80	41.20
$EDEXP3/EDEXP$	42	19.97	6.96	3.30	32.90
$DORPRIM$	49	36.39	16.42	4.70	71.80
$REPSEC$	81	18.94	8.60	2.20	31.20
$PTRAT$	58	28.27	10.83	11.30	54.10
$\Delta(EDEXP/GDP)$	39	0.08	0.63	-1.80	1.60
$\Delta(EDEXP/TOTEXP)$	13	-1.31	3.30	-8.20	1.80
$\Delta(EDEXP1/EDEXP)$	25	1.72	3.31	-4.60	9.40
$\Delta(EDEXP2/EDEXP)$	22	-0.67	3.32	-8.20	4.30
$\Delta(EDEXP3/EDEXP)$	22	-0.54	3.91	-7.10	9.70
$\Delta(DORPRIM)$	24	-0.60	14.37	-32.00	34.80
$\Delta(REPSEC)$	50	-0.35	3.54	-12.50	14.50
$\Delta(PTRAT)$	28	0.62	3.46	-5.70	9.20
Post-decision point subsample					
	Obs	Mean	Std. Dev.	Min	Max
$EDEXP/GDP$	52	3.96	1.71	1.80	8.60
$EDEXP/TOTEXP$	22	16.11	3.58	8.90	25.60
$EDEXP1/EDEXP$	26	47.66	8.29	31.20	63.90
$EDEXP2/EDEXP$	24	24.36	5.70	13.30	38.70
$EDEXP3/EDEXP$	24	17.32	6.96	4.90	34.70
$DORPRIM$	65	40.58	16.30	5.50	72.80
$REPSEC$	105	15.24	8.64	1.40	36.10
$PTRAT$	69	28.45	9.22	14.40	54.30
$\Delta(EDEXP/GDP)$	42	-0.06	0.47	-1.50	0.80
$\Delta(EDEXP/TOTEXP)$	17	1.22	2.06	-1.60	7.40
$\Delta(EDEXP1/EDEXP)$	16	-1.56	4.18	-6.80	8.50
$\Delta(EDEXP2/EDEXP)$	13	-0.31	3.28	-8.30	4.40
$\Delta(EDEXP3/EDEXP)$	13	-0.84	2.13	-3.70	4.70
$\Delta(DORPRIM)$	54	-0.43	10.28	-20.70	27.60
$\Delta(REPSEC)$	92	-0.40	2.74	-19.60	3.60
$\Delta(PTRAT)$	58	0.91	2.98	-5.70	16.30

Table 1: Descriptive statistics: Educational variables

Interim period HIPCs subsample					
		Mean	Std. Dev.	Min	Max
$EDEXP/GDP$	38	3.67	1.70	1.80	8.60
$EDEXP/TOTEXP$	17	15.40	3.79	8.90	25.60
$EDEXP1/EDEXP$	18	50.48	5.97	40.50	63.90
$EDEXP2/EDEXP$	17	24.19	5.35	13.30	37.30
$EDEXP3/EDEXP$	17	16.58	6.87	4.90	34.70
$DORPRIM$	49	42.80	15.22	12.50	72.80
$REPSEC$	69	17.32	8.43	1.60	36.10
$PTRAT$	47	29.38	8.63	14.40	54.30
$\Delta(EDEXP/GDP)$	33	0.00	0.36	-0.80	0.80
$\Delta(EDEXP/TOTEXP)$	14	1.32	2.11	-0.20	7.40
$\Delta(EDEXP1/EDEXP)$	10	-1.76	3.46	-6.80	2.30
$\Delta(EDEXP2/EDEXP)$	9	-1.09	3.52	-8.30	2.60
$\Delta(EDEXP3/EDEXP)$	9	-0.40	2.30	-3.70	4.70
$\Delta(DORPRIM)$	39	1.02	9.88	-20.70	27.60
$\Delta(REPSEC)$	59	-0.42	3.22	-19.60	3.60
$\Delta(PTRAT)$	39	1.25	3.50	-5.70	16.30
Post-completion subsample					
	Obs	Mean	Std. Dev.	Min	Max
$EDEXP/GDP$	14	4.74	1.55	2.30	7.00
$EDEXP/TOTEXP$	5	18.54	0.66	18.10	19.70
$EDEXP1/EDEXP$	8	41.31	9.62	31.20	61.20
$EDEXP2/EDEXP$	7	24.79	6.93	17.30	38.70
$EDEXP3/EDEXP$	7	19.11	7.37	6.20	26.60
$DORPRIM$	16	33.77	18.09	5.50	69.20
$REPSEC$	36	11.25	7.68	1.40	30.00
$PTRAT$	22	26.48	10.29	16.50	54.30
$\Delta(EDEXP/GDP)$	9	-0.27	0.74	-1.50	0.40
$\Delta(EDEXP/TOTEXP)$	3	0.77	2.15	-1.60	2.60
$\Delta(EDEXP1/EDEXP)$	6	-1.23	5.53	-6.60	8.50
$\Delta(EDEXP2/EDEXP)$	4	1.45	2.00	0.00	4.40
$\Delta(EDEXP3/EDEXP)$	4	-1.83	1.47	-3.50	0.00
$\Delta(DORPRIM)$	15	-4.21	10.67	-20.70	20.60
$\Delta(REPSEC)$	33	-0.36	1.61	-4.20	3.20
$\Delta(PTRAT)$	19	0.22	1.20	-3.20	2.80

Table 2: Descriptive statistics: Educational variables

Decision point effect		
	$(\bar{x}_{DP} - \bar{x}_{NDP})$	$(\bar{x}_{DP} - \bar{x}_{NDP}) = 0$, p-value
$\Delta(EDEXP/GDP)$	-0.14	0.25
$\Delta(EDEXP/TOTEXP)$	2.53	0.02
$\Delta(EDEXP1/EDEXP)$	-3.28	0.01
$\Delta(EDEXP2/EDEXP)$	0.37	0.75
$\Delta(EDEXP3/EDEXP)$	-0.30	0.80
$\Delta(DORPRIM)$	0.17	0.95
$\Delta(REPSEC)$	-0.05	0.92
$\Delta(PTRAT)$	0.29	0.69
Completion point effect		
	$(\bar{x}_{CP} - \bar{x}_{NCP})$	$(\bar{x}_{CP} - \bar{x}_{NCP}) = 0$, p-value
$\Delta(EDEXP/GDP)$	-0.26	0.14
$\Delta(EDEXP/TOTEXP)$	-0.55	0.69
$\Delta(EDEXP1/EDEXP)$	0.53	0.82
$\Delta(EDEXP2/EDEXP)$	2.54	0.21
$\Delta(EDEXP3/EDEXP)$	-1.43	0.28
$\Delta(DORPRIM)$	-5.23	0.09
$\Delta(REPSEC)$	0.06	0.93
$\Delta(PTRAT)$	-1.04	0.22

Table 3: Differences in educational variables: pre-decision/post-decision and pre-completion/post-completion

	$\Delta(EDEXP/GDP)$	$\Delta(DORPRIM)$	$\Delta(REPSEC)$	$\Delta(PTRAT)$
Decision-point effect	-0.216	2.317	0.251	0.573
(unmatched)	[0.141]	[3.297]	[0.514]	[0.804]
Decision-point effect	-0.075	28.05	-0.69	2.447
(matched, 1 control)	[0.341]	[19.03]	[1.123]	[1.310]
Decision-point effect	-0.275	12.00	-0.459	2.368
(matched, 2 controls)	[0.326]	[14.907]	[.855]	[1.478]
Decision-point effect	-0.142	13.97	-0.698	2.492
(matched, 3 controls)	[0.269]	[11.979]	[.826]	[1.403]
Decision-point effect	-0.219	13.76	-0.499	2.132
(matched, 4 controls)	[0.240]	[10.965]	[0.858]	[1.385]
Decision-point effect	-0.205	14.06	-0.348	2.409
(matched, 5 controls)	[0.234]	[10.489]	[0.839]	[1.312]
Observations	56	67	118	76
Selection equation: decision				
Civil liberties	0.0784	-0.0572	0.115	0.395
	[0.555]	[0.468]	[0.215]	[0.292]
Net aid transfers	4.084**	4.590***	2.546***	2.389***
	[1.898]	[1.491]	[0.519]	[0.675]
Inflation	-0.00125	-0.220*	0.00506	0.0193
	[0.114]	[0.113]	[0.0112]	[0.0305]
GDP p.c.	45.12*	4.984	0.536	-3.96
	[25.93]	[11.38]	[4.162]	[7.186]
GDP p.c. growth	-0.860**	-0.501*	0.0207	0.15
	[0.426]	[0.275]	[0.0873]	[0.105]
Armed conflict	-5.542**	-2.572**	-0.785*	-0.483
	[2.492]	[1.210]	[0.431]	[0.551]
Pseudo R-squared	0.747	0.770	0.543	0.541

Table 4: Differences in educational variables (post-decision/pre-decision): Matched estimates

	$\Delta(EDEXP/GDP)$	$\Delta(DORPRIM)$	$\Delta(REPSEC)$	$\Delta(PTRAT)$
Completion-point effect	-0.27	-5.355*	0.117	-1.035
(unmatched)	[0.190]	[3.141]	[0.599]	[0.830]
Completion-point effect	0.167	-9.312**	-1.729***	0.083
(matched, 1 control)	[0.344]	[4.486]	[0.535]	[0.912]
Completion-point effect	0.183	-9.025**	-1.193	0.271
(matched, 2 controls)	[0.34]	[4.199]	[1.242]	[0.822]
Completion-point effect	0.117	-7.471**	-0.737	-0.542
(matched, 3 controls)	[0.338]	[4.066]	[1.869]	[1.932]
Completion-point effect	0.092	-8.131**	0.892	-2.1
(matched, 4 controls)	[0.332]	[3.878]	[1.713]	[1.691]
Completion-point effect	0.02	-8.585**	0.824	-3.032**
(matched, 5 controls)	[0.322]	[3.777]	[1.61]	[1.529]
Observations	37	52	91	58
Selection equation: decision				
Net aid transfer	2.855**	3.403***	2.573***	2.261***
	[1.265]	[1.057]	[0.637]	[0.726]
Years since decision	0.962***	0.874***	1.019***	0.837***
	[0.349]	[0.338]	[0.227]	[0.246]
Population	0.557	2.496***	1.408***	1.029***
	[0.417]	[0.749]	[0.354]	[0.398]
GDP p.c. growth	-25.33	-27.23**	-9.665**	-19.98*
	[18.78]	[12.01]	[4.606]	[10.22]
GDP p.c.	0.143	0.419**	0.0842	0.0222
	[0.232]	[0.196]	[0.103]	[0.125]
Armed conflict	-	-0.687	-0.357	0.52
	-	[0.707]	[0.613]	[0.790]
Pseudo R-squared	0.571	0.485	0.550	0.533

Table 5: Differences in educational variables (post-completion/pre-completion): Matched estimates

	$\Delta(EDEXP/GDP)$		$\Delta(DORPRIM)$		$\Delta(REPSEC)$		$\Delta(PTRAT)$	
Decision-point effect	-0.358	-0.147	2.004	2.894	1.079	0.601	-0.787	-0.837
	[0.211]	[0.185]	[3.771]	[3.646]	[0.839]	[0.905]	[1.008]	[1.028]
Lagged ed. var.	-	-0.107***	-	-0.260***	-	-0.0356	-	-0.0103
	-	[0.0358]	-	[0.0792]	-	[0.0276]	-	[0.0448]
ρ=0, p-val.	0.3716	0.8311	0.8694	0.7338	0.2398	0.4302	0.0416	0.0498
Completion-point effect	-0.468***	-0.326*	-8.828	-12.15**	-4.400***	-4.496***	0.339	0.245
	[0.180]	[0.190]	[7.014]	[6.022]	[0.570]	[0.603]	[1.348]	[1.323]
Lagged ed. var.	-	-0.0765**	-	-0.264***	-	-0.0478	-	0.0125
	-	[0.0365]	-	[0.0757]	-	[0.0320]	-	[0.0479]
ρ=0, p-val.	0.0232	0.0295	0.5768	0.3917	0.0001	0.0002	0.1358	0.1742

Table 6: Differences in educational variables (post-decision/pre-decision and post-completion/pre-completion): Heckman estimates