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Debt Relief under the HIPC Initiative: Why Some Countries Complete the Programme Faster Than Others.

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Abstract

The Highly Indebted Poor Countries (HIPC) initiative has been one of the primary avenues for delivering debt relief to developing countries in the past decade. However, the performance of countries in the HIPC programme has been vastly heterogeneous with some countries reaching completion point much faster than others. This paper uses Cox-Proportional hazard models to explain the wide disparity in completion times by examining how the economic, social and governance environments within a country affect the speed of completion. The findings suggest that better economic management, increased trade, more effective government machinery, and a more stable political environment among others are all significant in speeding up completion times.

Keywords: HIPC, Hazard Models, Survival Analysis, AID, Debt Relief, Development.

JEL Classification: C32, F14, F21, F43, G01

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1. INTRODUCTION

The Highly Indebted Poor Countries (HIPC) initiative has been one of the primary avenues for delivering debt relief to developing countries in the past decade. As at December 2012, 33 countries had completed the programme with 3 other countries – Chad, Comoros and Guinea - on track for completion. In order to access debt relief under the HIPC initiative, beneficiary countries had to commit to the development and implementation of a poverty reduction strategy and the maintenance of macroeconomic stability and good performance under programmes supported by loans from the IMF and World Bank. Accessing debt relief was therefore critically dependent on a country's ability to implement its poverty reduction strategy and maintain sound economic management.

However, the performance of countries in the HIPC programme has been vastly heterogeneous with some countries reaching completion point much faster than others. As an example, Tanzania officially joined the HIPC initiative in March 2002 and reached completion point 21 months later. Similarly, Cote d'Ivoire enrolled in the programme in March 2009 and despite a deteriorating economic, social and political environment in the country due to the disputed elections of 2010, it reached completion point a mere 22 months later in June 2012. In contrast, Guinea-Bissau entered the HIPC programme in December 2000 and spent 123 months in the programme before reaching completion point. As at December 2012, Chad and Guinea had already spent 137 and 143 months respectively in the programme and are still yet to reach completion point. What explains this wide disparity in completion times? Despite the extensive and rapidly expanding literature on the HIPC programme, aid and debt relief, this question has yet to attract any attention. In light of calls to improve the pace of delivery of aid and debt relief, a clear understanding of some of these factors will highlight areas that need urgent attention. This paper therefore uses Cox-proportional hazard survival models to examine how the economic, social and governance environments within a country affect the speed with which it completes the HIPC programme. Apart from unearthing the key factors, this analysis will also shed light on why some countries perform better than others with aid or debt relief and how donors can better target future aid and debt relief efforts to where it might be most effective.

The rest of the paper is structured as follows - the next section discusses the HIPC initiative followed by a review of the literature on aid and debt relief. This is followed by a discussion of the analytical framework and the dataset. The methodology and results are then presented.

Concluding remarks, summarising the findings and highlighting their implications for policy makers and the HIPC programme, then follow.

2. THE HIPC INITIATIVE

The combination of high interest rates and reduced export revenues as a result of the recession precipitated by the oil price shocks of the 1970s plunged many developing economies into debt. Unsurprisingly, this heightened social and political tensions in many of these countries during the late 1970s to early 1990s, resulting in coup d'états and other forms of rebellion during the period, particularly in Africa (Marshall et al, 2004). To protect themselves, successive governments increased the size of the military and police forces as well as the civil service in an effort to boost patronage. As a result, many of the foreign loans went into financing the military, police and the civil service as opposed to productive investments. Additionally, corrupt officials siphoned off large chunks of these loans into personal bank accounts (Easterly, 2002).

By 1991, the ratio of debt service to exports exceeded 40% for many developing countries especially those that had borrowed heavily in the decade before (World Bank, 2012). The World Bank considers a debt to export ratio above 20-25% as unsustainable so in its 1991 Africa Report, it warned that it would be almost impossible for many African countries to get on a path to sustainable development without significant reductions in their debt burdens. This prompted a series of Programmes and schemes by bilateral and multilateral creditors aimed at helping highly indebted countries cope with their debt burdens. These initiatives included partial forgiveness of debt, longer maturities on existing debt, lower interest rates and debt repayment rescheduling.

In spite of these efforts, the debts of many of the countries remained at unsustainable levels. In September 1996, the IMF and World Bank combined efforts to launch the Highly Indebted Poor Countries Initiative (HIPC) aimed at reducing debt burdens to sustainable levels through substantial reductions in debt service obligations and commitment to a series of reforms. These reforms are aimed at shifting resources away from debt servicing toward productive investments in health and education. Under the HIPC programme, eligible countries must commit to sustained poverty reduction by developing a Poverty Reduction Strategy Paper (PRSP) through a broad-based participatory process. After a comprehensive review in 1999, the HIPC Programme was “enhanced” to increase the number of eligible countries, increase the amount of relief available to each country and to deliver that relief faster (Hepp, 2005a). The Multilateral Debt Relief Initiative (MDRI) was launched in 2005 to supplement the HIPC initiative. Under the

MDRI, countries completing the HIPC initiative qualified for 100% relief on eligible debts owned to the World Bank, African Development Bank and the IMF. As at the end of 2011, the HIPC initiative had delivered over \$76 billion (in end-2010 net present value terms) in debt relief to 36 countries (World Bank, 2012).

3. A REVIEW OF THE LITERATURE ON AID AND DEBT RELIEF

Although the theoretical justifications for debt relief are well established, the empirical assessment of the effectiveness of debt relief has been fairly recent. In their seminal paper, Chauvin and Kraay (2007) assess whether debt relief over the period 1989 – 2003 reduced debt overhang and freed up resources for development spending for a sample of 62 developing countries. They find that debt relief has had little or no significant impact on the level and composition of public spending in recipient countries. Since then, a plethora of papers have focused on issues around debt relief effectiveness, with researchers examining various aspects of the relationship between debt relief, economic growth and development. For instance Hepp (2005a) examined whether the HIPC initiative and other debt relief Programmes of the 1980s and 1990s has had any significant impact on economic growth rates, concluding that in general, the effect of debt relief on economic growth rates has been negligible. Fikru and Getachew (2008) also examine whether debt relief led to economic growth and development using data from 14 HIPC African countries that received debt relief between 1990 and 2001. They find a negative correlation between aid and economic development in most cases and add that even in cases where there was economic development this could not be explicitly linked to debt relief.

One of the principal aims of debt relief is to free up resources to boost government spending in areas such as health and education so a large swath of the literature has focused on empirically assessing debt relief impact on these social expenditures. For instance, Hepp (2005b) examined the effect of debt relief on per capita health expenditure for a sample of 122 developing countries and concludes that debt relief has had little or no effect on health expenditures, particularly in HIPC countries. However, compared to other developing countries, total health expenditures were higher in HIPC countries, possibly due to the conditions of the debt relief. Dessy and Vancatachellum (2007) also investigate the extent to which past debt relief has contributed to increased social services expenditure using debt relief over the period 1989-2003 and conclude that although debt relief has had a positive effect on social expenditures in health and education, this effect is small and only true for countries that had seen a significant improvement in their institutional governance.

Whether debt relief really does reduce debt burdens to sustainable levels or not has also received some attention in the literature (see Nwachukwu 2008; Sun 2004; Mwaba 2005; Gunter 2011). The focus has been on issues around the structural factors affecting the debt sustainability of post-completion point countries. These include their debt management capacity, export diversification, institutional frameworks and fiscal revenue mobilisation capacity. The results indicate that the debt management practices and the policy and institutional environments in many post-completion point HIPC countries remain weak, with narrow export bases and fiscal revenue mobilisation lags which impede their ability to maintain sustainable debt levels. General suggestions on ways to ensure debt sustainability have ranged from continued structural reforms and timely donor support to the close monitoring of new borrowings.

The process of developing and implementing the PRSP required at the decision point of the HIPC programme has also been examined in the literature (see e.g. Cheru 2006; Craig & Porter 2003; Hanley 2002; Huye & Hens 2009; Hens & Huye 2007). The focus has been on the challenges confronting governments in their quest to prepare and implement a credible and nationally owned PRSP and how this has changed the nature of the relationship between donors and recipients. The general conclusion suggests that although the PRSP process has had a noticeable impact on the conceptualisation and execution of poverty reduction strategies, numerous challenges remain. These include making the PRSP process more participatory and results-oriented in light of the multi-dimensional nature of poverty. There is also the need to balance the achievement of the PRSP objectives with a realistic approach bearing country-specific constraints in mind.

Overall, the conclusion from the literature indicates that aid and debt relief appear to have a largely insignificant effect on economic growth and development outcomes in recipient countries. This is summed up by Doucouliagos and Paldam (2008) who conduct a meta-analysis of 100 papers on aid and debt relief effectiveness, finding that although the effect of aid and debt relief on economic growth is positive, this effect is very small, insignificant and falling over time. Additionally, differences in publication outlet, model specification and data appear to account for the bulk of the differences between reported results.

One issue that remains unexplored is an empirical investigation of the factors influencing country completion rates in the HIPC programme. This paper therefore aims to fill this gap.

4. ANALYTICAL FRAMEWORK AND DATA

A HIPC-eligible country with a proven track record of reform, sound policies and macroeconomic stability is at the ‘decision point’ when it concludes an agreement with multilateral creditors to settle outstanding arrears and has developed a PRSP through a broad participatory process. The amount of debt relief required to bring the country’s debt burden to HIPC sustainability thresholds is calculated and the country begins receiving debt relief. Upon the satisfactory implementation of key reforms agreed to at the decision point and the maintenance of macroeconomic stability and good performance under programmes supported by loans from the IMF and World Bank, the country reaches the ‘completion point’ where it receives any outstanding debt relief agreed to at the decision point. Thus, once a country has reached the decision point, reaching the completion point is critically dependent on its ability to implement its poverty reduction strategy and maintain sound economic management. Consequently, an examination of the factors affecting the duration of stay in the HIPC programme is essentially an examination of the factors affecting a country’s ability to implement reforms and maintain economic stability.

The focus of this paper is therefore on examining how the economic, governance, social and institutional environments within a country influence the speed with which it is able to implement reforms and maintain sound economic management. Based on an examination of the literature, indicators considered include a measure for the quality of economic management, inequality, GDP per capita and its growth rate, inflation and trade openness. Governance and institutional indicators used include measures for the level of corruption control, accountability, political stability and government effectiveness. Table 1 summarises these indicators and their possible effects on HIPC completion rates. The sample comprises all the 36 countries that have completed or are currently in the HIPC programme. Table A in the appendix provides a list of these countries as well as their entry and exit dates from the HIPC programme. The period of analysis is from April 1997 (when Uganda became the first country to enrol in the HIPC programme) to December 2010.

Table 1: Variable description

Indicator	Description and source	Expected effect on completion rate
Economic and social indicators		
CPIA EMC	Quality of Economic Management – reflects the quality of government management of the economy. Ranges from a low of 1 to a high of 6. Source: (World Bank, 2007)	Possibly +
GDPpc	GDP per capita. Source: World Development Indicators (WDI, 2012)	Possibly +
GDPpc growth	The GDP per capita growth rate (%). Source: World Development Indicators (WDI, 2012)	Possibly +
Ex Debt Stock	External debt stock (% of GDP). Source: World Development Indicators (WDI, 2012)	Possibly +
Inflation	Inflation Rate (%). Source: World Development Indicators (WDI, 2012)	Could be either + or -
Trade	Trade (% of GDP). Source: World Development Indicators (WDI, 2012)	Possibly +
GINI	The Gini coefficient – an indicator of the level of societal inequality. Source: World Development Indicators (WDI, 2012)	Possibly -
Upop	Urban population (% of total population) – an indicator of the level of societal development. Source: World Development Indicators (WDI, 2012)	Possibly +
Governance and Institutional Indicators		
CC*	Control of Corruption – captures the extent to which public power is used for private gain. Source: World Governance Indicators (Kaufman et al, 2010)	Possibly +
VA*	Voice and Accountability – an indicator reflecting the level of freedom of expression, freedom of association and a free media as well as the extent to which a citizens are able to participate in selecting their government. Source: World Governance Indicators (Kaufman et al, 2010)	Possibly +
PV*	Political Stability – measures the likelihood that government may be destabilised through unconstitutional or violent means such as a coup d’etat, rebellion or terrorism. Source: World Governance Indicators (Kaufman et al, 2010)	Possibly +
GE*	Government Effectiveness – an indicator of the quality of public services and the quality of the civil service as well as the degree of its independence from political pressures. Also measures the quality of policy formulation and implementation and the credibility of government commitment to that process. Source: World Governance Indicators (Kaufman et al, 2010)	Possibly +
CPIA TAC	Government Transparency and Accountability – an indication of the level of transparency and government accountability. Ranges from 1 (low) to 6 (high). Source: (World Bank, 2007)	Possibly +
Democ	An indication of the level of democracy. Source: polity IV (Marshall et al, 2010)	Possibly +
Africa	Dummy. Equals 1 if country is in Africa	Could be + or -

* normalised, with a zero mean and a standard deviation of one and range from -2.5 to 2.5 unless otherwise indicated. Higher values indicate “better” governance/institutional quality.

5. THE COX-PROPORTIONAL HAZARD MODEL

Survival or duration models are often used to quantify the effect of one or more covariates on failure time. The term ‘failure’ as used in survival models indicates the occurrence of the event of interest. This event could be when a patient dies (hence the term ‘survival’), an unemployed person gets a job or when a civil war breaks out for example. So if T is a random variable with a

probability distribution $F(t)$ and a probability density function $f(t)$ representing survival time, then the probability of surviving to time t or beyond is given by:

$$S(t) = P(T > t) = 1 - F(t) \quad (1)$$

Where

$$F(t) = P(T \leq t) \quad (2)$$

The survival function $S(t)$ in (1) therefore describes the probability that a randomly selected country is still in the HIPC programme at a particular time t . The probability (or hazard) that a country completes the HIPC programme at time t given that it has not yet reached completion point at that time can be written as:

$$P(t \leq T < t + \Delta t | T \geq t) \quad (3)$$

The hazard function can thus be defined as:

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{1}{\Delta t} P(t \leq T < t + \Delta t | T \geq t) \quad (4)$$

$$= \lim_{\Delta t \rightarrow 0} \frac{1}{\Delta t} \frac{P([t \leq T < t + \Delta t] \cap [T \geq t])}{P(T \geq t)} \quad (5)$$

$$= \lim_{\Delta t \rightarrow 0} \frac{1}{\Delta t} \frac{P(t \leq T < t + \Delta t)}{P(T \geq t)} \quad (6)$$

$$= \frac{f(t)}{S(t)} \quad (7)$$

$$= -\frac{d}{dt} [\log S(t)] \quad (8)$$

Thus,

$$S(t) = \exp[-H(t)] \quad (9)$$

Where

$$H(t) = \int_0^t h(t) dt \quad (10)$$

$H(t)$ therefore represents the conditional probability of exit from the HIPC programme given that the country was in the HIPC programme at time t . For this analysis, the following specification of the semi-parametric Cox-proportional hazard model (Cox, 1972) and its corresponding survival function will be used:

$$h_i(t) = h_0(t) \exp(\beta X_i) \quad (11)$$

$$S_i(t) = S_0(t) \exp(-\beta X_i) \quad (12)$$

Where X_i denotes a vector of explanatory variables for country i 's spell in the HIPC programme and β is a vector of unknown coefficients. $h_0(t)$ and $S_0(t)$ represent the baseline hazard and survival function respectively, denoting the risk and survival probability of exiting from the HIPC programme for a particular country in the case where all X 's are 0. Semi-parametric

models like the ones above allow the estimation of the relationship between the hazard rate and explanatory variables without having to make any assumptions about the shape of the hazard function. This makes them very flexible and highly adaptable to a variety of applications. The dependent variable is the duration (in months) from the date a country achieves decision status to the date a country reaches completion. The failure event is when a country reaches completion. Countries still in the HIPC programme as at 31 December 2010 are censored (i.e. the country completes the programme beyond our observation period). A positive coefficient β for each covariate x_i indicates that the covariate shortens a country's spell in the HIPC programme whilst a negative coefficient β lengthens duration in the HIPC programme. Correspondingly, a hazard ratio β_i (the instantaneous exit rate), greater than 1 increase the risk of exit relative to the baseline hazard and thus shortens a country's spell in the HIPC programme whilst a hazard ratio less than 1 increases HIPC duration.

One key advantage of survival models over ordinary regression or probability models is that they are able to incorporate information from censored observations and can handle time varying covariates. By incorporating information from both censored and uncensored observations, the model produces consistent parameter estimates which are likely to be more accurate and more suited to forecasting than other models (Dupont, 2011).

6. RESULTS

Table 2 presents descriptive statistics for the HIPC countries. The average country lasts about 52 months in the HIPC programme with a median of 46 months. Guinea Bissau took 123 months to complete the programme, the longest of any country whilst Tanzania was the fastest country to reach completion point, taking only 21 months although the minimum duration in our sample was that of the Comoros, censored after 7 months of observation. Mean and median measures for voice and accountability, control of corruption, government efficiency and political stability as well as economic management and public sector transparency and accountability are all in the mid-ranges.

Table 2: descriptive statistics

variables	Mean	Median	Minimum	Maximum	Std.Dev.	Skewness
duration	51.938	46.083	7.066	123.700	28.440	1.156
VA	-0.548	-0.510	-1.486	0.520	0.553	0.099
CC	-0.747	-0.774	-1.588	-0.002	0.387	0.234
PV	-0.627	-0.437	-2.630	0.674	0.786	-0.678
GE	-0.850	-0.791	-1.736	-0.103	0.456	-0.117
CPIA EMC	3.464	3.458	2.133	4.429	0.600	-0.117
CPIA TAC	2.749	2.809	2.000	3.929	0.498	0.247
Ex debt stocks %	107.970	88.034	19.502	255.962	62.097	0.908
GDP pc	408.122	294.827	95.799	1200.609	292.623	1.506
GDP Pc Growth %	2.338	2.043	-2.122	9.235	2.360	0.930
Gini	43.752	42.910	27.820	64.300	8.313	0.589
Inflation %	7.726	5.450	1.303	21.241	5.720	0.986
Revenue %	13.727	12.400	0.377	21.143	4.273	-0.505
Trade%	71.001	65.340	27.729	202.151	37.221	1.637
Upop%	35.278	34.675	9.500	62.100	14.882	0.177
Democ	4.638	6.000	0.000	9.000	3.034	-0.316

The median HIPC country has an external debt burden of 88% of GDP, a GDP growth rate of 4.7%, a per capita income of \$295 (placing most of these countries in the low income bracket) and an annual per capita income growth rate of about 2%. Interestingly, government revenue (excluding grants) is only 14% of GDP on average. With such a small fraction of government revenue generated internally, it is almost inevitable that these countries were going to run up huge debts as they had to borrow to finance most of their expenditures. To compound matters, international trade as a percentage of GDP is only 71% on average. Several strands of the literature on economic growth and development have repeatedly emphasized the importance of trade as a vehicle to achieving rapid growth and industrialisation so perhaps, one of the ways these highly indebted countries could break free of the shackles of debt and aid dependence beyond debt relief is to redouble efforts to boost trade flows. The general level of development and democracy are also quite low.

Stratified into two groups (African and non-African), the African group on average took 13 months longer to complete the programme. Figures A and B in the appendix are Kaplan-Meier plots of survival times for the entire sample and for the African and non-African groups respectively showing this trend. The African group also had poorer governance, economic and institutional indicators compared to their non-African counterparts (tables 3 and 4).

Table 3: Descriptive statistics – African group

variable	Mean	Median	Minimum	Maximum	Std.Dev.	Skewness
duration MM	53.616	47.633	7.066	123.700	30.100	0.993
VA	-0.566	-0.523	-1.486	0.520	0.558	0.224
CC	-0.712	-0.735	-1.366	-0.002	0.374	0.485
PV	-0.571	-0.431	-2.186	0.674	0.749	-0.469
GE	-0.847	-0.792	-1.736	-0.103	0.453	-0.120
CPIA EMC	3.407	3.416	2.133	4.429	0.598	-0.034
CPIA TAC	2.758	2.785	2.000	3.929	0.489	0.351
Ex debt stocks %	114.295	95.889	41.850	255.962	61.530	0.950
GDP pc	351.918	260.973	95.799	1163.292	242.375	1.951
GDP Pc Growth %	2.218	2.154	-2.122	7.064	2.176	0.464
GINI	42.825	42.520	29.830	64.300	6.956	0.941
Inflation %	7.802	5.111	1.303	21.241	6.127	0.913
Revenue %	13.458	12.330	0.377	20.496	4.077	-0.762
Trade%	70.177	64.615	27.729	202.151	38.792	1.680
Upop%	33.751	33.133	9.500	62.100	14.587	0.262
Democ	4.354	5.000	0.000	9.000	3.028	-0.224

Table 4: Descriptive statistics – non-African group

variables	Mean	Median	Minimum	Maximum	Std.Dev.	Skewness
duration MM	41.540	39.500	31.466	58.767	11.204	1.002
VA	-0.435	-0.246	-1.317	0.116	0.570	-1.064
CC	-0.966	-0.841	-1.588	-0.556	0.441	-0.692
PV	-0.971	-0.442	-2.630	-0.236	1.015	-1.480
GE	-0.868	-0.698	-1.463	-0.229	0.529	-0.128
CPIA EMC	3.822	4.123	3.175	4.333	0.528	-0.548
CPIA TAC	2.696	2.926	2.000	3.429	0.611	-0.166
Ex debt stocks %	68.753	66.725	19.502	160.207	55.796	1.386
GDP pc	756.587	792.016	390.810	1200.609	363.851	0.049
GDP Pc Growth %	3.085	1.699	0.796	9.235	3.521	1.986
GINI	49.496	58.024	27.820	59.36	13.926	-1.226
Inflation %	7.257	7.913	4.147	9.275	2.119	-0.837
Revenue %	15.393	15.489	8.261	21.14	5.576	-0.230
Trade%	76.107	67.100	56.394	124.75	28.254	1.847
Upop%	44.743	45.450	24.800	61.80	14.566	-0.330
Democ	6.400	7.000	2.000	9.00	2.701	-1.338

A log-rank test (Freedman, 1983) helps to determine whether the differences between the African and non-African groups suggest a fundamental difference in the pattern of HIPC duration for the two groups, the results of which are reported in table 5. The null of no statistical difference in the survival functions of the two groups cannot be rejected, suggesting that the

survival patterns of the two groups are not statistically different. The results of the Wilcoxon test (Breslow, 1970), also reported in table 5 confirm this.

Table 5: Log-rank and Wilcoxon (Breslow) tests for equality of survival functions

Group	Events expected	Events observed	χ^2	P-value
African	2.87	5		
Non-African	29.13	27		
Log-rank test			1.88	0.1701
Wilcoxon test			1.61	0.2047

6.1 Cox Regression

The effects of the covariates on survival times are presented in table 6. Starting with the governance and institutional indicators, one significant factor in how long a country stays in the HIPC programme is its level of social freedom - a 1-unit increase in social freedoms in one year makes a country 3 times more likely to complete the HIPC programme in the following year possibly due to the fact that higher social freedoms foster a quicker and broader based formulation of the PRSP and widespread support for its implementation, leading to quicker completion times. The quality of economic management is also significant – a 1-unit increase in the quality of economic management in one year makes a country 5 times more likely to reach completion point the following year. Increases in government transparency and accountability also significantly shorten HIPC duration – a 1-unit increase makes a country 1.56 times more likely to complete in the next year. Government efficiency is also significant in getting a country to completion point, increasing completion likelihood 4 times for a 1-unit increase in efficiency. Increased democracy also improves completion rates. Improvements in government efficiency, transparency and accountability as well as improved economic management and increased social and media freedom often form part of the HIPC completion point assessment criteria, so the fact that these measures are correlated with faster completion times is not surprising. However, increased political stability and corruption control are often not directly accessed at completion point and so do not factor into whether a country reaches completion point or not, possibly explaining why their effects in the model are not significant although their effects are as expected.

Among the economic and social indicators, countries with a marginally higher external debt stock are likely to finish 1.7% faster. Possibly, a relatively higher external debt stock is likely to motivate a government to implement reforms faster in order to access debt relief. Although it has the expected positive effect, GDP per capita is not significant but its growth rate is. A faster

GDP per capita growth rate indicates favourable conditions in the economic and social environment which is favourable during completion point assessment. Trade openness and urban population are both significant and positively affect completion rates. Although the Gini coefficient is not significant, unequal societies tend to take longer to complete the HIPC programme as expected. Poverty reduction efforts are likely to prove less successful in a highly inflationary environment possibly accounting for the negative effect of the inflation rate on completion times although the effect is not significant. African countries generally take longer to complete the programme, although the Africa dummy is also not significant.

Table 6: Cox proportional hazard model estimates

Variable	Coefficient β_i	Std. Err	Hazard Ratio Exp β_i	P-Value
<i>VA</i>	1.189	68.436	3.285	0.017***
<i>CC</i>	0.413	0.547	1.511	0.531
<i>PV</i>	0.347	0.265	1.416	0.169
<i>GE</i>	1.437	5.888	4.212	0.004***
<i>CPIA EMC</i>	1.682	54.097	5.377	0.000***
<i>CPIA TAC</i>	0.443	10.573	1.557	0.007***
<i>Ex debt stock</i>	0.016	0.005	1.017	0.002***
<i>GDPpc</i>	0.001	0.002	1.001	0.751
<i>GDPpc growth</i>	0.524	0.108	1.689	0.019***
<i>Gini</i>	-0.019	0.043	0.981	0.676
<i>Inflation</i>	-2.137	0.058	0.118	0.755
<i>Trade</i>	0.677	0.012	1.968	0.014***
<i>Upop</i>	0.668	0.026	1.952	0.074**
<i>Africa</i>	-1.309	0.286	0.270	0.218
<i>Democ</i>	0.407	0.107	1.502	0.001***
<i>Log likelihood</i>	-47.865			
<i>LR χ^2 (15)</i>	65.84			0.000

significant at 5%; *significant at 1%

6.2 Diagnostic Testing

We use Schoenfeld residuals (Schoenfeld, 1983) to test for the appropriateness of using a proportional hazards model for this analysis (table 8) and fail to reject the null hypothesis of proportional hazards against an alternative of non-proportional hazards. Additionally, the *LR χ^2* statistic indicates that the model as a whole is significant in explaining HIPC duration.

Table 8: test of proportional-hazards assumption

	χ^2	df	Prob> χ^2
Global test	10.20	15	0.806

7. CONCLUSION

This paper uses survival analysis to examine possible factors affecting duration of stay in the HIPC programme. The findings suggest that better economic management, increased economic, social and media freedoms, more effective government machinery, increased trade, a faster GDP per capita growth rate, increased democracy and a more stable political environment are all significant in speeding up completion times. Countries have a clear incentive to complete the HIPC programme as quickly as possible since completion comes with access to significant relief in debt stock and debt service obligations. This implies that rapid improvements in governance, institutional and social indicators are quite feasible if there are tangible rewards at the end of the process. For policy makers, this may be a key insight. For the HIPC initiative itself, the results suggest that the programme is largely successful in getting countries to improve in key governance, institutional and economic areas and so perhaps, its format and assessment methods could be adopted by future debt relief initiatives. However, whether these countries maintain the progress made beyond the completion point or not is less certain and is an interesting avenue for future research.

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