How Robust are the Economic, Political and Institutional Determinants of Seigniorage?*

Richard M. Jong-A-Pin
University of Groningen

Jakob de Haan
University of Groningen
CESifo Munich

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Abstract

In this paper we examine how robust economic, political and institutional variables are related to seigniorage. We use Leamer's Extreme Bounds Analysis to deal with model uncertainty and a factor analytic setup to cope with the imperfect measurement of alternative seigniorage measures. Our analysis shows that most variables are not robustly related to seigniorage including democracy and corruption. Besides the *de facto* exchange rate regime and the level of GDP per capita, we find that internal conflicts and the involvement of the military in the political process are robustly related to seigniorage. Furthermore, fiscal deficits and external conflicts are robust determinants of seigniorage in high inflation countries.

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*We thank Jan Egbert Sturm for his support with the EBA. Comments on this draft are welcome and all remaining errors are our own. Corresponding author: Richard Jong-A-Pin, Department of Economics, University of Groningen, PO Box 800, 9700 AV Groningen, The Netherlands. E-mail: r.m.jong-a-pin@eco.rug.nl

1 Introduction

Over the last twenty years numerous papers have tried to find a link between seigniorage and various economic, political and institutional variables. The theoretical literature seems to provide clear-cut propositions. Optimal tax considerations (Phelps, 1973), political stability (Cukierman, Edwards and Tabellini, 1992), an independent monetary policymaker (Sargent and Wallace, 1981), or democracy (Desai, Olofsgard and Yousef, 2003) are only but a few factors explaining cross-country differences in seigniorage. These hypotheses are often, if not always, backed by some cross-country (panel) regressions.

However, there is no consensus about how a proper regression model should be specified, since many specifications seem reasonable given the plethora of institutional theories. Temple (2000), therefore, rightly argues that presenting only the regression results of a single (or a few) model(s) might lead to misleading conclusions, because no information is obtained about the sensitivity of parameter estimates when other plausible variables are included in the model.

A different issue that has hardly received attention in empirical work on the determinants of seigniorage is the existence of many reasonable seigniorage indicators. Although Drazen (1985) provides a general seigniorage measure, this measure is deemed useless in practice because several components of it cannot be measured (see Honohan, 1996). Cagan (1956) and Friedman (1971) show that seigniorage is a tax on real money holdings. Unlike other tax sources its revenue for the government cannot be readily measured. It does, however, like other taxes consists of a tax base and a tax rate. While the tax rate is often proxied by the inflation rate to measure seigniorage, the base is often neglected in empirical studies. A different aspect in the measurement of seigniorage is the way it is normalized to make cross country comparison possible. Existing studies use either GDP or total government revenue to scale, but the choice made is likely to affect the estimation results. These measurement issues further complicate comparison of the results obtained by different authors.

The aim of this paper is to examine which economic, political and institutional determinants are robustly related to seigniorage. We investigate this issue for a panel of 92 countries in the period 1980-1999. We start with the problem of model selection as addressed above. We investigate a set of 40 explanatory variables that are potentially related to seigniorage. We analyze these variables using Sala-i-Martin's (1997a, 1997b) variant of the Extreme Bounds Analysis (EBA). The central idea of EBA, which originates in the work of Leamer (1983, 1985) is to run a whole range of possible models and to examine how sensitive parameter estimates are to different model specifications. As will turn out, the use of different seigniorage measures affects the estimation results seriously. However, these seigniorage measures should reflect the same concept and can be regarded as noisy indicators of the true amount of seigniorage collected. One method to extract the most coherent part of the noisy seigniorage measures is a principal components analysis (PCA). The PCA allows us to find a linear combination of existing measures to construct a new seigniorage indicator which can be used in the EBA.

Using the results obtained from the PCA we find that hardly any explanatory variable is robust. Only internal conflicts and the involvement of the military in the political process (and to a lesser extent external conflicts) are robustly related to seigniorage.

This paper proceeds as follows: the next section provides a discussion of the Extreme Bounds Analysis as well as methods to deal with measurement error. Section three is split up in three parts: first, we construct a so-called base model, which will be used in the EBA. Next, we provide the results of the four seigniorage measures. The last part of this section gives the results of the EBA when we have controlled for measurement error in our dependent variable. Section four provides a discussion and a provisional conclusion of this paper.

2 Methodological Issues

2.1 Model Uncertainty

The essence of model uncertainty in applied empirical work is that economic theory often does not provide enough guidance how to specify the 'correct' regression model. A problem with many economic theories is their open-endedness. That is, many model specifications seem plausible given the data. This problem also applies to the realm of *which* economic, political and institutional indicators are responsible for cross-country differences in the levels of seigniorage. The overview of empirical studies shown in table 9 (appendix) reveals that every single paper has focused on different aspects of seigniorage ignoring other potentially important aspects of seigniorage. For example, Cukierman, Edwards and Tabellini (1992) focus on the role of political instability in the explanation of seigniorage. While they take into account cross-country differences in the efficiency of tax systems, they ignore the disciplining role the exchange rate regime has in the collection of seigniorage. On the other hand, recent studies that focus on the institutional determinants of seigniorage (e.g. Desai et al. (2003)) largely ignore the 'optimal tax' considerations in their specification.

For this paper, we identify about 40 variables that have been suggested to be related to seigniorage. As said, the problem we encounter is that theories explaining seigniorage do not invalidate each other and hence many model specifications seem reasonable. The Extreme Bounds Analysis of Leamer (1983, 1985) is a useful tool to deal with the uncertainty regarding the specification of the true regression model.[1] The basic idea underlying this method is that a regression model is specified in which a few variables are always left in the model and one potential variable is included. This potential explanatory variable, in turn, is subject to a whole range of regressions in which for each specification a different linear combination of other doubtful regressors are taken up in the model. On the basis of all these regressions, the

[1] Examples of applications in other areas of research are: Levine and Renelt (1992) and Sturm and de Haan (2005) for economic growth, Woo (2003) for public deficits and Baxter and Kouparitsas (2004) for business cylce synchronization.

parameter sensitivity of the potential variables is examined. Formally, the regression model in which the EBA is employed can be examplified as follows:

$$S = \theta M + \beta F + \gamma Z + u \quad (1)$$

where S represents the seigniorage measure, M is a matrix of structural explanatory variables, F is (a vector with) the variable under investigation in the EBA, Z is a matrix containing three variables which are also suggested to be a determinant of seigniorage in the existing literature and u is an error term.

The parameter sensitivity of the doubtful variable can be examined in various ways. Levine and Renelt (1992) (L&R), for instance, use the 'extreme bounds' criterion as proposed by Leamer (1983, 1985). On the basis of all regressions for their potential variable(s) they take the smallest parameter estimate and substract two times its standard error as well as the largest estimate and add two times its standard error. In case the range between the calculated bounds (which can be interpreted as a sort of confidence interval) does not include 0, the potential variable is said to be robustly related to the dependent variable. Sala-i-Martin (1997a, 1997b) argues that the 'extreme bounds' criterion is too strong for the potential variables to pass the robsutness test. Instead, he proposes to examine the entire distribution of parameter estimates in order to evaluate whether the density function for all parameter estimates does not include 0 in 90% of all cases. We follow this approach and, therefore, report the unweighted parameter estimate of β and its standard error, as well as the outcomes of the cumulative distribution function (CDF) test. The CDF test is based on the fraction of the cumulative distribution function lying on each side of zero. CDF(0) indicates the larger of the areas under the density function either above or below zero; in other words, regardless of whether this is CDF(0) or 1-CDF(0). So CDF(0) will always be a number between 0.5 and 1.0. This criterion is less strong than the L&R criterion.

We will use a variant of the criterion of Sala-i-Martin (1997a, 1997b). Instead of the 90% criterion as explained above, we advocate a more stringent criterion because of the one-sidedness of the t-test. As a complement to the Sala-i-Martin criterion, we also consider the percentage of significant parameter estimates of the potential variable.

2.2 Measurement Error

Governments obtain seigniorage as a source of revenue when they tax the real money holdings of the public by increasing the money supply (Cagan,1956 and Friedman, 1971). As opposed to other tax sources, it is not clear how much revenue is raised when using the inflation tax source. As a crude approximation to the true amount of seigniorage collected, several indicators have been proposed by various authors (see table 9 in the appendix (second column) and Honohan (1996) for an overview of the 'early' seigniorage literature). Drazen (1985) discusses the various seigniorage indicators and provides a general framework to measure seigniorage. In practice, however, this framework is deemed useless because several components of the general measure are not measurable. Although the various proxies differ, they also have some similar characteristics. Firstly, as seigniorage is a form of tax revenue most seigniorage indicators consists of a tax base and a tax rate. Furthermore, there seems to be consensus that the 'best' proxy for the tax base of seigniorage is the yearly increment of the monetary base in the country under consideration. As a proxy for the tax rate, the inflation rate seems to be the most likely candidate. However, various authors have proposed to use a monotonic transformation of the inflation rate, possibly to mitigate the problem of heteroscedasticity in regression analysis. Examples are a logarithmic transformation (e.g. Click (1998)) or $\frac{\pi}{1+\pi}$ as a proxy for the real annual depreciation of money, where π is defined as the annual inflation rate (e.g. Desai et al. (2003))[2] The crucial difference between the various poxies is the way they are normalized. While some authors advocate normalization against GDP (e.g. Cukierman et. al (1992)), others prefer to normalize seigniorage revenues against total government revenue (e.g. De Haan, Zelhorst and Roukens (1993)). It is noteworthy that the majority of scholars (especially in political science) only use the inflation rate as a proxy for seigniorage and no normalization. In our view this is only half of the story and hence, using the inflation rate, is a weak indicator for the true amount of seigniorage. [3]It should be noted that if the economy is in a steady state with a 0% real interest rates, all proposed proxies are the same, or at least proportional to each other (in other words: they should have a correlation of 1).

From our literature survey and omitting the inflation rate as a separate proxy for seigniorage, we define the following four seigniorage indicators:[4]

$$\begin{aligned}
S_t^A &= \frac{M0_t - M0_{t-1}}{R_t} \\
S_t^D &= \frac{\pi_t M0_t}{(1+\pi_t)R_t} \\
S_t^E &= \frac{M0_t - M0_{t-1}}{Y_t} \\
S_t^H &= \frac{\pi_t M0_t}{(1+\pi_t)Y_t}
\end{aligned}$$

where $M0_t$ is the monetary base of a country in year t, π_t is the annual inflation rate in year t, R_t is the total amount of government revenue (inclusive of seigniorage) in year t and Y_t is a countries Gross Domestic Product (GDP) in year t.

[2]For more details on this proxy we refer to Cukierman, Webb and Neyapti (1992).

[3]As seigniorage can also be seen as a cheap alternative to government borrowing, the opportunity costs of these government bonds are also a source of revenue for the government. As a proxy for this source, T-bill rates are used as the 'tax rate'. The main disadvantage of the latter proxy is that it is poorly available for most developing countries. Since our analysis focuses on both developed countries and developing countries we ignore the last proxy our analysis.

[4]A list of countries for which we have data can be found in table 11 (appendix)

The (pairwise) correlation matrix of the four seigniorage indicators below shows that all pairs of seigniorage measures have a positive correlation coefficient. The matrix also shows the correlation coefficients between the separate indicators and the inflation rate. It can be seen that the measures A, D and E form a group of indicators that have a strong correlation, while the H indicator correlates less with the other indicators; the H indicator only has a strong correlation with the inflation rate.

	A	D	E	H	π
A	1				
D	0.885	1			
E	0.683	0.643	1		
H	0.302	0.321	0.531	1	
π	0.398	0.420	0.430	0.711	1

It is not surprising that the various indicators have a positive correlation: they ought to measure the same phenomenon, i.e. seigniorage. It is also clear that no single pair of seigniorage measures has a correlation coefficient equal to 1. It seems that all indicators convey some information about the true amount of seigniorage collected, but none of them tells us the same story. Therefore, we consider the separate proxies for seigniorage as imperfect measures of the true amount of seigniorage.

A useful descriptive data reduction method to deal with imperfectly measured indicators of an unobserved (latent) variable is the so-called Principal Components Analysis (PCA). This method tries to find a vector containing the 'latent variable' (the true, but unobserved, data generating process) that explains as much of the variance of the separate indicators.

The PCA can be examplified as follows. Consider the following set-up:

$$S = \lambda\zeta' + E$$

where S is the matrix of (centered) seigniorage indicators with N rows (countries) and 4 columns (indicators). Hence a typical row i of S is:

$$s_i = \begin{bmatrix} s_i^a & s_i^d & s_i^e & s_i^h \end{bmatrix}$$

λ is the true, but unobserved, amount of seigniorage, ζ is a vector of factor loadings (to be explained below) and E is some error term.[5] The idea of PCA is to find the vectors λ and ζ such that the sum of squared residuals is minimized. The solution of this problem is to find the largest eigenvalue of the covariance matrix $S'S$. The corresponding eigenvector is ζ and λ_i can be calculated as $\lambda_i = \zeta' s_i$. As can be seen λ (the principal component) is a linear

[5] It should be noted that we demeaned the seigniorage indicators so that we can forget about a constant term in our notation. Wansbeek and Meijer (2000) show that this has no consequences for the remainder of the analysis.

combination of the separate centered indicators weighted by the elements of the eigenvector ζ. That is, the vector with factor loadings reflects how much information each indicator conveys about the true level of seigniorage. (An elaborate discussion of PCA and its relationship with Factor Analysis can be found in Wansbeek and Meijer (2000)).

3 Data and Results

In order to analyze the determinants of seigniorage we construct a large dataset with 4 seigniorage indicators and 40 explanatory variables. The seigniorage measures are constructed using the *IMF International Financial Statistics CD ROM 2003.* The data sources and definitions of the explanatory variables can be found in table 10 (appendix). We have data for a maximum of 92 countries for the period 1980-1999. Since for many developing countries data are missing, we use 5-year averages for our data analysis. The periods are 1980-1984, 1985-1989, 1990-1994, 1995-1999. A similar approach can be found in Woo (2003).[6]

3.1 A Base Model with the Usual Suspects

The first step in the EBA is to select those variables making up the M matrix in our analysis. We start with a broad specification of our regression model using variables that are thought to be robustly related to seigniorage. The foremost candidate to include in the specification is an exchange rate indicator (PEG). As shown by Fischer (1983) a fixed exchange rate restrains governments from collecting seigniorage. A fixed exchange rate regime is expected to be a credible device to restrict seigniorage revenues (see also Giavazzi and Pagano, 1988). Henceforth, countries with a fixed exchange rate are expected to have lower seigniorage than countries with a (more) flexible exchange rate regime. To be sure that countries are really constrained from collecting seigniorage, we consider the Reinhart and Rogoff (2002) *de facto* exchange rate dummy as the best indicator for our analysis. The second variable we take up is the fiscal deficit of the central government (DEF). Fischer, Sahay and Vegh (2003), e.g., show that seigniorage is highly correlated with the fiscal stance of the central government. A third aspect which is considered to be a determinant of seigniorage is the efficiciency of the tax system. Cukierman et. al (1992) use several proxies for the efficiency of the tax system: GDP per capita (GDPCAP), the level of urbanization (URBAN), the relative size of the manufacturing sector (MANU), the relative size of the agricultural sector (AGRI) and the log of the population density (LOGDENS), respectively. Using the general to specific approach of model selection and the following regression setup:

$$S_{itk} = \mu + \beta X_{it} + \alpha_i + \epsilon_{it}$$

[6]We include a variable in a particular period if data for at least 3 out of 5 years is available. For the ICRG data, data for some variables start in 1984. Because of the stickyness of these institutional variables we consider the observation for 1984 as representative for the whole period 1980-1984.

where S_{itk} is the seigniorage measure ($k \in \{A, D, E, H\}$) for the i^{th} country in the t^{th} period ($t = 1, \cdots, 4$), μ is a constant term, X_{it} is the set of explanatory variables and $\alpha_i + \epsilon_{it}$ is a composite error term where α_i is an individual specific component that does not vary over time and ϵ_{it} is a remainder component, we conclude that DEF, PEG and GDPCAP should be included in any regression model explaining seigniorage. Table 1 shows the results of the random effects model including DEF, PEG and GDPCAP as explanatory variables for the four seigniorage measures.[7]

[Insert table 1 about here]

For each measure the explanatory variables are of the expected sign and highly significant. Table 1 also contains the estimation results of the sample excluding the periods in which a particular country experienced an average inflation rate above 100%. The observations that are exluded from this sample can be found in table 2. It is clear that excluding these high inflation observations reduces the estimated parameter value of each explanatory variable. Furthermore, it can be seen that both the significance of GDPCAP and PEG is unchanged. However, excluding high inflation periods of the sample renders DEF insignificant for all seigniorage measures, indicating that fiscal deficits are only a robust determinant of seigniorage in high inflation countries. Similar findings were reported by de Haan and Zelhorst (1990).

[Insert table 2 about here]

3.2 Extreme Bounds Analysis

The next step is to do the EBA for DEF, PEG and GDPCAP (from now on these three variables are denoted as M). Using the notation of the previous sections, this implies the following regression model:

$$S_{itk} = \theta M_{it} + \gamma Z_{it} + u_{it}$$

$$u_{it} = \alpha_i + \epsilon_{it}$$

where the second equation refers to the random effects model with country specific effects.

The results of the EBA for the M-variables are shown in table 3. The results of the EBA of the base model show that the inclusion of all possible subsets of Z-variables do not have a large influence on the parameter estimates of the M variables, since the average (unweighted) β's are close to the estimates shown in table 2. The calculated values of the (unweighted) CDF(0) indicate that PEG and DEF are robustly related to seigniorage for at least three of the seigniorage measures according to the criterion of Sala-i-Martin. In contrast, GDPCAP

[7] Here, we only show the results of the random effects models. The reason is that the null-hypothesis of the Hausman test (which states that the fixed effects estimates are not different from the random effects) could not be rejected for each specified base model. Since the random effects model leaves us more degrees of freedom and is generally more efficient under the null-hypothesis, we prefer this regression model above the fixed effects variant.

does not pass the robustness criterion. If one considers the EBA of the base model for the sample without the high inflation countries (periods), PEG and GDPCAP are found to be robustly related to the alternative seigniorage measures. In this subsample DEF is highly insignificant according to the Sala-i-Martin criterion as well as the percentage of parameter values significant at the 5% significance level. This finding comfirms our previous that fiscal deficits are only a robust determinant of seigniorage in high inflation countries.

[Insert table 3 about here]

Now that the basemodel is specified, we investigate the robustness of 36 other potential determinants of seigniorage.[8] These variables can be roughly classified into seven categories:[9]

1. variables reflecting the efficiency of the tax system
2. variables reflecting the polity of countries
3. variables reflecting the type of government in power
4. variables reflecting the strength of governance
5. variables reflecting the degree of political instability
6. variables reflecting the independence of the central bank
7. socioeconomic characteristics and regional dummies

Because we are now interested in the robustness of the other explanatory variables given the inclusion of the M-variables, our regression models are as follows:

$$S_{itk} = \theta M_{it} + \beta F_{it} + \gamma Z_{it} + u_{it}$$

$$u_{it} = \alpha_i + \epsilon_{it}$$

where we have used the same notation as above. The results of the EBA for the four seigniorage measures are shown in table 4.[10]

[8] In our original set-up we also included EXPROP as an explanatory variable. This variable is highly significant for all seigniorage measures (CDF = 0.999 and percentage of significant parameter values above 95% for all seigniorage measures). However, as seigniorage is a form of government expropriation (i.e. the expropriation of real money holdings) and the inclusion of EXPROP turns out to affect our results drastically, we omit this variable in the subsequent analysis.

[9] A full description of our the explanatory variables can be found in table 10 (appendix).

[10] The table also shows the average number of observations used in the regressions for the specific F-variable. As can be seen this number is rather low for some variables (GINI, TOR and CDEBT). This implies that for these variables 'on average' only a maximum of 25, 28 and 40 countries are examined, respectively. In order to mitigate this problem, we put several restrictions on the minimum amount (between 150 and 200) of observations to be used in the regressions. The consequence of these restrictions is that GINI, TOR and CDEBT are no longer robustly related with seigniorage for any seigniorage measure. It turns out that the same restrictions on the other F-variables leave our results unaffected.

[Insert table 4 about here]

It is clear from table 4 that the majority of the (unweighted average) regression coefficients of the variables under investigation are of the expected sign. CORRUPTION, FRAC and MANU are, however, notable exceptions. Moreover, the influence of TRADE, URBAN and POLARIZ is indeterminate and depends on the used seigniorage measure. Another result revealed by table 4 is that no single variable is robustly related to seigniorage for all 4 seigniorage measures according to the (adjusted) Sala-i-Martin criterion. Only AGRI (A), CDEBT(E, H), EXTCON (E), GROWTH (D, H), INTCON (A, D), LAW (D) and TOR (D) are robustly related to some of the seigniorage measures. The percentage of significant β's of these robust variables for some of the indicators varies between 71% and 90% supporting the view that they are structurally related to some of the seigniorage indicators.

Table 5 displays the results of the EBA for the sample excluding high inflation observations. While the estimated signs of the explanatory variables (except MANU and INDUST) are as expected in case all signs are equal across seigniorage measures, we find altering signs for the variables AGRI, CDEBT, URBAN, TRADE, POLARIZ, GROWTH and GASTIL. Like the sample in which all observations are used no F-variable is robust for all 4 seigniorage measures. The variables that are robust for some seigniorage measures are: AGRI (D), EXECRLC (D), INDUST (E), INTCON (A), LAW (D), MANU (E), MILPOL (A, E) and SUBAFR (E). Now, the percentage of significant parameter estimates is much lower than for the full sample, indicating that some of the significance is largely driven by the high inflation observations.

[Insert table 5 about here]

The EBA thus far leaves us with a few variables that pass the 'strong' variant of the Sala-i-Martin criterion. Note that obviously more variables would pass the original Sala-i-Martin criterion. However, no single variable is found robust for all seigniorage indicators. One reason could be that these explanatory variables are indeed not very robustly related to seigniorage. However, another reason could be that the different seigniorage indicators are only crude approximations of the true amount of seigniorage raised and that (in fact) robust relationships between the political and institutional indicators are masked by the noise in the dependent variable. As explained in section 2.2, PCA provides us a tool to elaborate on this issue and to examine whether really no variable is robustly related to seigniorage.

3.3 A 'New' Seigniorage Proxy

In the previous subsection we presented the EBA results for the separate seigniorage measures. Now, we turn to the same analysis using a new seigniorage proxy obtained from a PCA. The eigenvector corresponding to the largest eigenvalue (2.731) of the correlation matrix is:

$$\zeta_1 = \begin{bmatrix} 0.905 \\ 0.896 \\ 0.871 \\ 0.591 \end{bmatrix}$$

where the subscript 1 is used to denote that this eigenvector corresponds to the largest eigenvalue. This eigenvector reflects the factor loadings of the centered seigniorage measures. It is clear that indicator A receives the highest weight in the construction of the new seigniorage proxy and that indicator H receives the lowest weight. This implies that indicator A comes closest to the true level of seigniorage collected relative to the other indicators.[11] The variance that the principal component explains of the original data is 68.3%. Using the results of the PCA, we are able to predict the true amount of seigniorage collected. The results of the prediction can be found in table 6.

[Insert table 6 about here]

The newly obtained seigniorage indicator ($\hat{\lambda}$) is now used as the dependent variable in the EBA.[12] The EBA model alters into:

$$\hat{\lambda}_{it} = \theta M_{it} + \beta F_{it} + \gamma Z_{it} + u_{it}$$

$$u_{it} = \alpha_i + \epsilon_{it}$$

The results of the EBA using the new seigniorage indicator can be found in table 7. It is clear from table 7 that now only two variables pass the Sala-i-Martin criterion: INTCON and EXTCON. If one examines the results from the subsample without high inflation observations the results indicate thet INTCON and MILPOL are robust determinants of seigniorage. The percentage of significant parameter values lies between 65% and 75% indicating that the variables are significant at the 5% significance level for the majority of the regressions.

[Insert table 7 about here]

[11] We also did a PCA that included the inflation rate as an indicator for seigniorage. The analysis left us with two eigenvalues greater than 1, which implies that the variance is of the indicators is best explained by two underlying factors. Regarding the first component, the H indicator as well as the inflation rate would both receive weights smaller than 0.1. This finding can be interpreted as evidence that the inflation rate may not be a good indicator for seigniorage.

[12] We also did the same investigation procedure for our base variables. The results, however, remain largely unaltered. For the full sample, the respective CDF's of PEG, GDPCAP and DEF are: 1.00, 0.92 and 0.98. For the sample excluding high inflation periods the CDF's of PEG, GDPCAP and DEF are: 1.00, 0.97, and 0.87, respectively.

4 Discussion and Concluding Remarks

In this paper, we examined the robustness of the relationship between seigniorage and various economic, political and institutional variables. We dealt with (1) the robustness of the dependent variable using Principal Components Analysis as well as (2) the robustness of the specified model using the Extreme Bounds Analysis. Our analysis shows that the use of different seigniorage indicators results in different conclusions about which variables are robust and which are not. Using an efficient linear combination of the existing seigniorage indicators as a 'new' dependent variable in the EBA shows that hardly any variable is a robust determinant of seigniorage. Especially, polity and variables reflecting the type of government in power perform very poorly in the EBA. Moreover, indicators that cover the governance of countries as well as the turnover rate (TOR) of the central bank governor do not seem to be robustly related to seigniorage.

We do find that the exchange rate, GDP per capita, internal conflicts and the involvement of the military in the political process are robust determinants of seigniorage. Furthermore, in the restricted sample fiscal deficits and external conflicts are also found to be robust. The finding that fiscal deficits are not a robust determinant of seigniorage in low and moderate inflation countries supports the finding of earlier studies like Burdekin (1987), de Haan and Zelhorst (1990) and Fischer et. al (2003).

While earlier studies found evidence for some of the variables to be robust, we are the first to find that the military involvement in politics is a determinant of seigniorage. The channel through which these variables are related is not yet well understood. One reason why the two may be related is that, given the significance of internal (and to a lesser extent external) conflicts, a strong influence of the military induces politicians to raise funds (via seigniorage) to combat domestic and international tensions. A different interpretation is that the influence of the military is the ultimate reflection of a dependent monetary policymaker. That is, countries in which the military has much power in the political arena central bankers may be tempted to act according to the wishes of the military, because they might be afraid of (personal) repercussions.

A different remarkable finding is that political instability in general is not a robust determinant. While internal conflicts certainly reflect one aspect of instability, other variables like government fractionalization, the number of veto players who drop, democratic polarization or a strong legal framework are not sufficient nor necessary reasons that seigniorage revenues vary between countries. This finding provides us with a new perspective on the relevance of political instability as a determinant of seigniorage, which remains to be work for future research.

Other issues that deserve further attention are related to the fact that we did not allow for non-linear relationships between seigniorage and the explanatory variables and that we also ignored the possibility of interaction effects between the explanatory variables. Given the increasing interest in the possible interaction between institutions, this seems a promising agenda to follow. Moreover, although we controlled for outliers in our dependent variables, we ignored the possibility of outliers in the explanatory variables. While applications of outlier robust estimation methods are still no standard practice in applied empirical work and its merits are not clear relative to ordinary regression methods, the exercise seems worthwile (see Temple (2000) and Sturm and de Haan (2005)).

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Table 1: Random individual effects panel estimation results for the base model

Measure	A ALL	A $\pi < 100\%$	D ALL	D $\pi < 100\%$	E ALL	E $\pi < 100\%$	H ALL	H $\pi < 100\%$
Constant	0.195	0.170	0.211	0.166	0.048	0.036	0.422	0.052
	(12.146)**	(10.887)**	(12.587)**	(12.816)**	(9.106)**	(9.635)**	(3.008)**	(8.568)**
DEF	-0.306	-0.106	-0.342	-0.160	-0.162	-0.020	-2.627	-0.060
	(-3.255)**	(-1.088)	(-3.097)**	(-2.007)*	(-4.809)**	(-0.803)	(-2.453)*	(-1.426)
GDPCAP	$-3.61e^{06}$	$-3.45e^{06}$	$-3.17e^{06}$	$-2.92e^{06}$	$-7.39e^{07}$	$-7.17e^{07}$	$-5.49e^{05}$	$-7.179e^{07}$
	(-5.130)**	(-5.600)**	(-4.483)**	(-5.580)**	(-3.410)**	(-4.761)**	(-1.063)	-3.086
PEG	-0.114	-0.084	-0.149	-0.099	-0.031	-0.016	-0.431	-0.034
	(-7.695)**	(-5.699)**	(-9.367)**	(-8.217)**	(-6.318)**	(-4.369)**	(-3.119)**	(-5.777)**
$\overline{R}^2$	0.755	0.740	0.732	0.774	0.597	0.665	0.302	0.547
Hausman statistic	0.137	0.055	1.998	0.719	2.396	1.152	0.439	2.992
Obs.	261	239?	252	240	290	263?	280	264

t-statistics shown in parenthesis. *=significant at 5%, **=significant at 1%.

The results are based on White (1980) heteroscedasticity consistent standard errors.

Table 2: Observations with an inflation rate higher than 100%

Country	Period	Average Inflation	Measure A	Measure D	Measure E	Measure H
Argentina	1980-1984	268%	0.290	0.615	0.0978	0.405
Argentina	1985-1989	863%	0.187	0.562	0.067	1.109
Argentina	1990-1994	505%	0.186	0.242	0.0208	0.232
Bolivia	1985-1989	2414%	0.253	0.224	0.035	2.091
Brazil	1980-1984	132%	0.081	0.086	0.0215	0.057
Brazil	1985-1989	532%	0.177	0.171	0.056	0.401
Brazil	1990-1994	1667%	0.226	0.224	0.085	1.542
Bulgaria	1990-1994	124%	0.135	0.226	0,057	0,230
Bulgaria	1995-1999	253%	0,148	0.139	0.066	0.299
Dem. Rep. Congo	1990-1994	6425%	0.658	0.642	0.123	4.081
Israel	1980-1984	178%	0.336	0.327	0.303	0.941
Nicaragua	1985-1989	3358%	0.494	0.511	0.268	11.190
Nicaragua	1990-1994	2096%	0.161	0.156	0.114	5.173
Peru	1985-1989	879%	0.419	0.428	0.092	0.790
Peru	1990-1994	1607%	0.242	0.240	0.051	1.744
Romania	1990-1994	208%	0.1424	0.194	0.058	0.235

Table 3: Extreme Bounds Analysis of the Basic Regression Model

All Countries							$\pi < 100\%$					
Variable	Lower bound	Upper bound	% with sign. β	Unw. CDF	Unw. β	Unw. stand. error	Lower bound	Upper bound	% with sign. β	Unw. CDF	Unw. β	Unw. stand. error
Measure: A												
PEG	-0,214	-0,010	100,00	1,000	-0,108	0,018	-0,217	0,005	99,99	1,000	-0,081	0,017
GDPCAP	0,000	0,000	66,18	0,953	0,000	0,000	0,000	0,000	72,89	0,970	0,000	0,000
DEF	-0,967	0,670	78,80	0,969	-0,295	0,119	-0,695	0,717	0,13	0,782	-0,093	0,115
Measure: D												
PEG	-0,286	-0,028	100,00	1,000	-0,146	0,019	-0,212	-0,031	100,00	1,000	-0,102	0,014
GDPCAP	0,000	0,000	64,68	0,919	0,000	0,000	0,000	0,000	76,57	0,961	0,000	0,000
DEF	-1,011	0,440	79,50	0,980	-0,321	0,133	-0,893	0,342	11,85	0,934	-0,149	0,095
Measure: E												
PEG	-0,085	-0,002	100,00	1,000	-0,032	0,006	-0,062	0,002	99,93	1,000	-0,019	0,004
GDPCAP	0,000	0,000	42,28	0,891	0,000	0,000	0,000	0,000	65,53	0,951	0,000	0,000
DEF	-0,484	0,233	85,11	0,965	-0,148	0,041	-0,173	0,193	1,81	0,766	-0,024	0,031
Measure: H												
PEG	-2,407	0,252	92,68	0,991	-0,444	0,174	-0,155	-0,016	100,00	1,000	-0,041	0,007
GDPCAP	0,000	0,000	0,64	0,618	0,000	0,000	0,000	0,000	45,76	0,897	0,000	0,000
DEF	-13,809	4,602	47,56	0,925	-2,435	1,304	-0,272	0,419	7,18	0,857	-0,055	0,049

A constant term is included in the regressions. The results are based on White (1980) heteroscedasticity consistent standard errors.

Table 4: Extreme Bounds Analysis of the Doubtful Variables

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
AGRI A	185.00	-0.788	0.960	86.45	**0.957**	0.248	0.100
AGRI D	180.06	-0.560	1.214	55.77	0.931	0.207	0.109
AGRI E	204.25	-0.287	0.232	0.86	0.552	-0.004	0.028
AGRI H	199.15	-11.049	9.713	1.68	0.634	0.389	0.900
ALLHOUSE A	187.64	-0.063	0.104	0.26	0.790	0.014	0.016
ALLHOUSE D	183.35	-0.061	0.086	0.00	0.738	0.011	0.015
ALLHOUSE E	206.04	-0.021	0.034	1.51	0.817	0.006	0.005
ALLHOUSE H	201.58	-0.369	1.484	0.84	0.868	0.217	0.158
BUREAU A	192.71	-0.059	0.059	17.91	0.866	-0.009	0.007
BUREAU D	187.24	-0.059	0.047	28.24	0.909	-0.012	0.008
BUREAU E	212.03	-0.017	0.022	5.06	0.757	-0.002	0.002
BUREAU H	206.57	-0.734	0.896	5.91	0.802	-0.072	0.074
CDEBT A	134.21	-0.473	0.157	16.59	0.792	0.019	0.020
CDEBT D	132.27	-0.443	0.170	60.23	0.883	0.032	0.019
CDEBT E	144.72	-0.089	0.096	82.00	**0.952**	0.030	0.006
CDEBT H	142.78	-0.124	1.275	87.20	**0.972**	0.294	0.093
CORRUPTION A	192.71	-0.109	0.053	2.06	0.588	-0.002	0.007
CORRUPTION D	187.24	-0.088	0.088	8.66	0.662	0.004	0.007
CORRUPTION E	212.03	-0.024	0.026	21.48	0.791	0.003	0.002
CORRUPTION H	206.57	-0.251	1.213	67.43	0.928	0.163	0.072
DEMACC A	192.71	-0.045	0.076	16.46	0.819	-0.007	0.007
DEMACC D	187.24	-0.045	0.053	10.51	0.779	-0.007	0.007
DEMACC E	212.03	-0.015	0.015	2.00	0.656	-0.001	0.002
DEMACC H	206.57	-0.562	0.548	0.14	0.675	-0.032	0.066
EASIA A	196.83	-0.384	0.455	1.85	0.785	0.033	0.040
EASIA D	191.34	-0.458	0.429	0.00	0.595	-0.008	0.039
EASIA E	216.71	-0.103	0.140	0.17	0.688	0.007	0.013
EASIA H	211.04	-4.026	3.793	0.00	0.513	-0.001	0.296
ETHNIC A	192.71	-0.098	0.035	36.01	0.851	-0.008	0.006
ETHNIC D	187.24	-0.071	0.046	6.77	0.659	-0.003	0.006
ETHNIC E	212.03	-0.016	0.014	2.87	0.578	0.000	0.002
ETHNIC H	206.57	-0.916	0.441	0.05	0.575	-0.014	0.054
EXECNAT A	196.06	-0.138	0.210	0.00	0.545	-0.002	0.024
EXECNAT D	190.86	-0.241	0.226	23.61	0.861	-0.035	0.025
EXECNAT E	215.40	-0.055	0.055	1.08	0.548	-0.001	0.008
EXECNAT H	210.03	-1.432	1.961	0.00	0.717	-0.127	0.219
EXECREG A	196.06	-0.548	0.515	0.00	0.593	-0.019	0.070
EXECREG D	190.86	-0.463	0.483	0.00	0.512	-0.002	0.070
EXECREG E	215.40	-0.234	0.207	0.00	0.646	-0.011	0.024
EXECREG H	210.03	-6.451	6.618	0.00	0.536	-0.062	0.592

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
EXECRLC A	137.79	-0.191	0.212	0.03	0.589	-0.004	0.016
EXECRLC D	134.04	-0.187	0.113	0.05	0.535	-0.003	0.017
EXECRLC E	150.34	-0.048	0.061	0.15	0.545	0.001	0.006
EXECRLC H	146.41	-1.853	1.150	0.02	0.730	-0.141	0.198
EXECRURL A	196.06	-0.516	0.329	0.00	0.517	0.001	0.080
EXECRURL D	190.86	-0.492	0.459	0.35	0.797	0.086	0.082
EXECRURL E	215.40	-0.095	0.045	0.00	0.714	-0.014	0.019
EXECRURL H	210.03	-3.371	2.473	0.00	0.523	-0.058	0.587
EXECSPEC A	196.06	-0.141	0.160	0.00	0.504	0.000	0.019
EXECSPEC D	190.86	-0.120	0.236	0.28	0.700	-0.011	0.019
EXECSPEC E	215.40	-0.050	0.038	0.06	0.573	-0.001	0.006
EXECSPEC H	210.03	-1.846	1.457	0.02	0.727	-0.111	0.179
EXTCON A	192.71	-0.018	0.022	30.48	0.869	-0.004	0.003
EXTCON D	187.24	-0.017	0.024	59.16	0.940	-0.006	0.003
EXTCON E	212.03	-0.009	0.005	83.96	**0.950**	-0.003	0.001
EXTCON H	206.57	-0.324	0.125	48.20	0.862	-0.055	0.031
FRAC A	186.82	-0.312	0.310	11.08	0.892	-0.041	0.030
FRAC D	181.62	-0.337	0.325	0.02	0.766	-0.023	0.031
FRAC E	205.16	-0.093	0.098	0.02	0.528	0.000	0.010
FRAC H	199.79	-5.958	2.389	0.57	0.508	-0.024	0.302
GASTIL A	196.83	-0.186	0.452	0.93	0.602	-0.010	0.034
GASTIL D	191.34	-0.106	0.393	10.51	0.838	0.041	0.035
GASTIL E	216.71	-0.091	0.119	2.72	0.692	-0.007	0.011
GASTIL H	211.04	-3.606	1.560	1.22	0.556	-0.078	0.307
GINI A	99.35	-0.019	0.009	3.65	0.502	0.000	0.001
GINI D	99.24	-0.015	0.010	0.21	0.510	0.000	0.001
GINI E	110.87	-0.004	0.002	0.08	0.513	0.000	0.000
GINI H	110.76	-0.059	0.047	6.68	0.734	0.002	0.003
GOVSTAB A	192.71	-0.021	0.030	21.15	0.856	-0.004	0.003
GOVSTAB D	187.24	-0.021	0.027	54.84	0.931	-0.006	0.003
GOVSTAB E	212.03	-0.006	0.007	0.66	0.630	0.000	0.001
GOVSTAB H	206.57	-0.199	0.423	0.09	0.623	-0.009	0.037
GROWTH A	196.21	-1.009	1.656	0.76	0.705	-0.106	0.197
GROWTH D	190.72	-1.693	1.296	84.26	**0.963**	-0.679	0.210
GROWTH E	216.09	-0.627	0.464	2.75	0.726	-0.050	0.072
GROWTH H	210.42	-34.350	3.760	90.47	**0.974**	-7.140	2.186
ILLIT A	152.46	-0.744	1.040	1.91	0.766	0.062	0.076
ILLIT D	146.99	-0.586	1.158	0.57	0.652	0.037	0.081
ILLIT E	167.08	-0.196	0.243	0.00	0.548	-0.003	0.024
ILLIT H	161.44	-9.477	6.789	0.17	0.578	0.147	0.626
INDUST A	185.00	-0.787	1.100	0.02	0.683	-0.050	0.105
INDUST D	180.06	-0.908	0.724	0.58	0.648	-0.044	0.110
INDUST E	204.25	-0.168	0.235	3.15	0.842	0.032	0.030
INDUST H	199.15	-11.035	6.509	0.02	0.714	-0.578	0.972

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
INTCON A	192.71	-0.027	0.023	75.58	**0.973**	-0.008	0.003
INTCON D	187.24	-0.027	0.018	78.18	**0.971**	-0.009	0.003
INTCON E	212.03	-0.009	0.006	54.93	0.913	-0.002	0.001
INTCON H	206.57	-0.450	0.143	26.11	0.896	-0.052	0.032
LATINCA A	196.83	-0.462	0.445	6.77	0.813	0.027	0.027
LATINCA D	191.34	-0.377	0.442	61.04	0.949	0.053	0.027
LATINCA E	216.71	-0.104	0.074	17.59	0.866	0.010	0.008
LATINCA H	211.04	-1.939	2.530	28.91	0.933	0.313	0.195
LAW A	192.71	-0.059	0.039	64.09	0.949	-0.013	0.006
LAW D	187.24	-0.062	0.027	77.17	**0.971**	-0.016	0.006
LAW E	212.03	-0.017	0.015	37.20	0.851	-0.003	0.002
LAW H	206.57	-0.488	0.763	0.23	0.612	-0.016	0.062
LOGDENS A	195.97	-0.216	0.207	0.40	0.644	-0.006	0.012
LOGDENS D	190.48	-0.231	0.243	0.93	0.734	-0.009	0.012
LOGDENS E	215.85	-0.041	0.035	0.00	0.630	-0.002	0.004
LOGDENS H	210.18	-1.205	1.567	0.00	0.598	-0.018	0.099
MANU A	159.74	-0.700	1.169	1.63	0.534	0.032	0.157
MANU D	154.66	-0.820	0.883	0.05	0.550	0.028	0.159
MANU E	177.75	-0.237	0.291	3.24	0.833	0.047	0.045
MANU H	172.50	-16.989	5.405	0.64	0.695	-0.849	1.531
MILITARY A	196.06	-0.170	0.083	1.85	0.555	0.001	0.022
MILITARY D	190.86	-0.175	0.073	8.53	0.571	-0.008	0.023
MILITARY E	215.40	-0.073	0.042	9.76	0.711	0.005	0.008
MILITARY H	210.03	-1.194	2.052	17.28	0.817	0.272	0.211
MILPOL A	192.71	-0.037	0.040	48.11	0.915	-0.009	0.005
MILPOL D	187.24	-0.030	0.049	23.61	0.808	-0.006	0.006
MILPOL E	212.03	-0.011	0.014	15.98	0.863	-0.002	0.002
MILPOL H	206.57	-0.354	0.424	5.15	0.682	-0.030	0.051
POLARIZ A	189.99	-0.061	0.107	0.46	0.507	0.000	0.010
POLARIZ D	184.79	-0.058	0.078	0.84	0.514	0.001	0.011
POLARIZ E	207.29	-0.022	0.034	7.78	0.560	-0.001	0.004
POLARIZ H	202.09	-0.684	0.742	1.62	0.516	-0.017	0.104
PRTYIN A	171.88	-0.004	0.004	0.08	0.826	0.001	0.001
PRTYIN D	166.68	-0.006	0.003	0.11	0.664	0.000	0.001
PRTYIN E	188.79	-0.001	0.001	0.00	0.778	0.000	0.000
PRTYIN H	183.42	-0.038	0.060	0.26	0.545	0.001	0.007
RELPOL A	192.71	-0.056	0.076	9.15	0.796	-0.006	0.006
RELPOL D	187.24	-0.054	0.073	27.84	0.854	-0.009	0.007
RELPOL E	212.03	-0.021	0.022	16.82	0.860	-0.003	0.002
RELPOL H	206.57	-0.845	0.456	0.00	0.543	-0.012	0.061
STABNS A	195.75	-0.247	0.234	0.50	0.764	0.030	0.038
STABNS D	190.56	-0.236	0.254	45.35	0.891	0.062	0.039
STABNS E	214.91	-0.071	0.062	0.52	0.540	0.001	0.014
STABNS H	209.72	-2.654	2.973	0.38	0.588	0.097	0.427

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
SUBAFR A	196.83	-0.489	0.354	5.62	0.713	-0.022	0.033
SUBAFR D	191.34	-0.522	0.401	3.18	0.817	-0.034	0.034
SUBAFR E	216.71	-0.135	0.081	53.60	0.940	-0.017	0.010
SUBAFR H	211.04	-4.034	4.672	0.08	0.668	-0.097	0.236
TOR A	114.91	-0.072	0.326	6.10	0.813	0.028	0.027
TOR D	112.89	-0.069	0.269	71.23	**0.977**	0.062	0.029
TOR E	124.22	-0.040	0.076	2.15	0.685	0.005	0.010
TOR H	122.20	-2.194	1.347	15.31	0.607	0.063	0.360
TRADE A	196.83	-0.331	0.202	0.00	0.664	-0.010	0.020
TRADE D	191.34	-0.350	0.115	2.22	0.714	-0.015	0.021
TRADE E	216.71	-0.068	0.056	30.88	0.874	0.009	0.007
TRADE H	211.04	-3.877	1.565	0.00	0.555	0.019	0.192
URBAN A	196.83	-0.618	0.394	2.96	0.760	-0.052	0.064
URBAN D	191.34	-0.565	0.347	1.30	0.562	-0.014	0.068
URBAN E	216.71	-0.181	0.151	24.46	0.852	0.024	0.020
URBAN H	211.04	-5.492	6.937	0.09	0.761	0.355	0.471

For each seigniorage measure, the results are based on 6545 regressions. A constant term is included in the regressions. The results are based on White (1980) heteroscedasticity consistent standard errors.

Table 5: Extreme Bounds Analysis of the Doubtful Variables: No outliers

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
AGRI A	171.10	-0.810	0.976	66.72	0.938	0.192	0.096
AGRI D	171.94	-0.505	0.824	70.79	**0.961**	0.170	0.079
AGRI E	186.93	-0.288	0.187	0.40	0.659	-0.011	0.024
AGRI H	187.76	-0.204	0.263	0.00	0.695	-0.015	0.031
ALLHOUSE A	173.77	-0.074	0.078	0.00	0.569	-0.002	0.014
ALLHOUSE D	174.61	-0.064	0.050	1.33	0.849	-0.011	0.010
ALLHOUSE E	188.74	-0.019	0.025	0.00	0.510	0.000	0.004
ALLHOUSE H	189.57	-0.028	0.032	0.02	0.788	-0.005	0.006
BUREAU A	177.10	-0.036	0.113	2.48	0.662	-0.003	0.006
BUREAU D	177.94	-0.039	0.091	16.52	0.761	-0.005	0.005
BUREAU E	193.17	-0.010	0.016	0.28	0.576	0.000	0.002
BUREAU H	194.00	-0.020	0.025	0.28	0.690	-0.001	0.003
CDEBT A	130.49	-0.479	0.157	10.42	0.762	-0.020	0.022
CDEBT D	131.32	-0.448	0.124	1.02	0.547	-0.003	0.017
CDEBT E	137.74	-0.091	0.047	2.73	0.685	0.003	0.005
CDEBT H	138.58	-0.132	0.163	57.02	0.805	0.019	0.009
CORRUPTION A	177.10	-0.100	0.031	43.35	0.942	-0.011	0.006
CORRUPTION D	177.94	-0.099	0.029	33.74	0.881	-0.008	0.005
CORRUPTION E	193.17	-0.020	0.009	28.43	0.876	-0.002	0.002
CORRUPTION H	194.00	-0.024	0.022	3.13	0.508	0.000	0.002
DEMACC A	177.10	-0.043	0.103	11.44	0.685	-0.004	0.006
DEMACC D	177.94	-0.028	0.074	3.06	0.556	-0.001	0.005
DEMACC E	193.17	-0.012	0.020	3.62	0.716	-0.001	0.002
DEMACC H	194.00	-0.012	0.025	4.48	0.768	0.002	0.002
EASIA A	181.20	-0.439	0.575	4.52	0.793	0.034	0.040
EASIA D	182.03	-0.363	0.515	0.00	0.590	-0.006	0.034
EASIA E	197.64	-0.101	0.177	0.06	0.709	0.006	0.010
EASIA H	198.48	-0.206	0.224	0.00	0.663	-0.005	0.016
ETHNIC A	177.10	-0.111	0.036	47.62	0.877	-0.007	0.005
ETHNIC D	177.94	-0.068	0.029	16.99	0.730	-0.003	0.004
ETHNIC E	193.17	-0.014	0.013	8.16	0.529	0.000	0.001
ETHNIC H	194.00	-0.015	0.016	2.28	0.592	-0.001	0.002
EXECNAT A	180.72	-0.136	0.198	0.00	0.551	-0.003	0.022
EXECNAT D	181.56	-0.148	0.169	0.95	0.564	0.003	0.018
EXECNAT E	196.63	-0.039	0.050	11.11	0.700	0.004	0.006
EXECNAT H	197.46	-0.051	0.071	0.20	0.542	-0.001	0.009
EXECREG A	180.72	-0.657	0.852	0.00	0.536	-0.006	0.065
EXECREG D	181.56	-0.586	0.842	0.00	0.540	0.007	0.055
EXECREG E	196.63	-0.149	0.186	0.00	0.581	-0.004	0.017
EXECREG H	197.46	-0.296	0.402	0.00	0.500	0.000	0.026

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
EXECRLC A	127.22	-0.098	0.213	0.18	0.774	0.011	0.014
EXECRLC D	128.05	-0.108	0.156	69.08	**0.962**	0.023	0.011
EXECRLC E	136.33	-0.024	0.062	0.57	0.848	0.004	0.004
EXECRLC H	137.16	-0.049	0.044	4.86	0.776	0.006	0.007
EXECRURL A	180.72	-0.209	0.129	0.00	0.626	-0.016	0.040
EXECRURL D	181.56	-0.187	0.117	0.00	0.604	0.009	0.033
EXECRURL E	196.63	-0.068	0.029	0.00	0.758	-0.010	0.011
EXECRURL H	197.46	-0.073	0.062	0.00	0.554	-0.003	0.019
EXECSPEC A	180.72	-0.125	0.167	0.00	0.502	0.001	0.016
EXECSPEC D	181.56	-0.069	0.182	1.10	0.756	0.011	0.013
EXECSPEC E	196.63	-0.029	0.034	2.89	0.720	0.003	0.004
EXECSPEC H	197.46	-0.031	0.054	0.02	0.581	0.002	0.007
EXTCON A	177.10	-0.020	0.022	20.43	0.827	-0.003	0.002
EXTCON D	177.94	-0.015	0.019	49.75	0.916	-0.004	0.002
EXTCON E	193.17	-0.004	0.006	64.69	0.929	-0.001	0.001
EXTCON H	194.00	-0.009	0.010	66.92	0.921	-0.002	0.001
FRAC A	172.04	-0.414	0.179	11.95	0.882	-0.036	0.027
FRAC D	172.88	-0.320	0.128	0.73	0.725	-0.014	0.021
FRAC E	186.95	-0.083	0.050	0.00	0.659	0.003	0.007
FRAC H	187.78	-0.137	0.062	0.50	0.549	-0.002	0.011
GASTIL A	181.20	-0.177	0.409	5.88	0.721	-0.021	0.031
GASTIL D	182.03	-0.125	0.297	1.99	0.733	0.019	0.025
GASTIL E	197.64	-0.051	0.088	7.88	0.700	-0.005	0.008
GASTIL H	198.48	-0.087	0.158	6.77	0.765	0.011	0.012
GINI A	95.09	-0.021	0.009	1.47	0.521	0.000	0.001
GINI D	95.93	-0.011	0.012	0.52	0.721	0.001	0.001
GINI E	104.11	-0.004	0.002	0.15	0.549	0.000	0.000
GINI H	104.94	-0.003	0.004	0.00	0.672	0.000	0.000
GOVSTAB A	177.10	-0.017	0.028	9.37	0.757	-0.002	0.003
GOVSTAB D	177.94	-0.016	0.024	24.54	0.816	-0.003	0.002
GOVSTAB E	193.17	-0.005	0.006	13.69	0.763	-0.001	0.001
GOVSTAB H	194.00	-0.008	0.011	37.27	0.847	-0.002	0.001
GROWTH A	180.58	-0.603	1.729	20.76	0.895	0.280	0.189
GROWTH D	181.41	-1.019	1.235	4.39	0.716	-0.114	0.156
GROWTH E	197.02	-0.173	0.447	23.27	0.906	0.080	0.051
GROWTH H	197.86	-0.476	0.681	0.89	0.550	-0.009	0.083
ILLIT A	133.59	-0.573	1.297	21.10	0.875	0.116	0.088
ILLIT D	134.43	-0.320	1.187	38.96	0.939	0.134	0.073
ILLIT E	148.05	-0.147	0.332	0.57	0.641	0.009	0.021
ILLIT H	148.88	-0.173	0.379	5.55	0.706	0.023	0.033
INDUST A	171.10	-0.763	1.719	3.15	0.594	0.047	0.103
INDUST D	171.94	-0.732	0.905	11.02	0.640	-0.034	0.083
INDUST E	186.93	-0.086	0.255	43.22	**0.961**	0.048	0.025
INDUST H	187.76	-0.236	0.262	0.84	0.792	0.028	0.032

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
INTCON A	177.10	-0.021	0.022	67.20	**0.956**	-0.006	0.003
INTCON D	177.94	-0.021	0.017	65.53	0.941	-0.005	0.002
INTCON E	193.17	-0.008	0.006	60.64	0.923	-0.002	0.001
INTCON H	194.00	-0.010	0.007	55.83	0.915	-0.002	0.001
LATINCA A	181.20	-0.462	0.550	6.68	0.740	0.019	0.028
LATINCA D	182.03	-0.388	0.331	31.95	0.895	0.032	0.024
LATINCA E	197.64	-0.075	0.082	6.59	0.785	0.006	0.007
LATINCA H	198.48	-0.189	0.135	3.90	0.772	0.008	0.011
LAW A	177.10	-0.040	0.041	48.42	0.904	-0.008	0.005
LAW D	177.94	-0.039	0.027	66.71	**0.953**	-0.010	0.004
LAW E	193.17	-0.009	0.014	33.78	0.821	-0.002	0.001
LAW H	194.00	-0.019	0.012	39.14	0.885	-0.004	0.002
LOGDENS A	180.34	-0.238	0.185	4.86	0.772	-0.016	0.016
LOGDENS D	181.17	-0.240	0.144	14.04	0.839	-0.020	0.015
LOGDENS E	196.78	-0.066	0.028	4.17	0.796	-0.004	0.004
LOGDENS H	197.62	-0.104	0.045	4.84	0.816	-0.008	0.007
MANU A	147.77	-0.777	1.598	17.89	0.724	0.142	0.147
MANU D	147.77	-0.697	1.050	5.06	0.511	0.011	0.117
MANU E	162.35	-0.120	0.362	45.01	**0.950**	0.070	0.036
MANU H	162.35	-0.275	0.353	4.39	0.858	0.054	0.046
MILITARY A	180.72	-0.148	0.145	0.24	0.554	0.003	0.021
MILITARY D	181.56	-0.132	0.131	4.89	0.567	-0.005	0.018
MILITARY E	196.63	-0.043	0.045	26.89	0.799	0.007	0.006
MILITARY H	197.46	-0.108	0.052	0.21	0.634	0.003	0.009
MILPOL A	177.10	-0.047	0.030	70.24	**0.967**	-0.011	0.005
MILPOL D	177.94	-0.051	0.037	25.81	0.835	-0.005	0.004
MILPOL E	193.17	-0.012	0.009	67.81	**0.956**	-0.003	0.001
MILPOL H	194.00	-0.016	0.015	24.95	0.837	-0.003	0.002
POLARIZ A	175.27	-0.098	0.109	0.52	0.521	-0.001	0.009
POLARIZ D	176.11	-0.083	0.080	2.29	0.599	0.003	0.007
POLARIZ E	189.31	-0.021	0.030	7.10	0.650	-0.001	0.002
POLARIZ H	190.15	-0.033	0.036	7.49	0.743	0.003	0.004
PRTYIN A	157.72	-0.003	0.005	0.02	0.684	0.000	0.001
PRTYIN D	158.55	-0.004	0.004	0.00	0.532	0.000	0.000
PRTYIN E	171.20	-0.001	0.001	0.00	0.533	0.000	0.000
PRTYIN H	172.03	-0.001	0.002	0.02	0.618	0.000	0.000
RELPOL A	177.10	-0.071	0.052	27.55	0.865	-0.008	0.006
RELPOL D	177.94	-0.078	0.029	32.85	0.882	-0.007	0.005
RELPOL E	193.17	-0.019	0.013	35.00	0.908	-0.002	0.001
RELPOL H	194.00	-0.021	0.019	48.42	0.943	-0.005	0.002
STABNS A	180.41	-0.214	0.245	2.98	0.789	0.030	0.033
STABNS D	181.25	-0.183	0.200	51.75	0.948	0.051	0.027
STABNS E	196.32	-0.055	0.068	0.58	0.520	0.001	0.009
STABNS H	197.15	-0.074	0.070	1.97	0.741	0.010	0.014

Variable	Mean Obs.	Lower bound	Upper bound	% with sign. β	Unweighted CDF	Unweighted β	unw. stand. error
SUBAFR A	181.20	-0.558	0.387	12.30	0.879	-0.044	0.034
SUBAFR D	182.03	-0.590	0.386	19.04	0.886	-0.039	0.029
SUBAFR E	197.64	-0.157	0.122	74.03	**0.969**	-0.016	0.008
SUBAFR H	198.48	-0.258	0.167	34.50	0.926	-0.018	0.012
TOR A	104.34	-0.119	0.329	0.03	0.765	0.021	0.028
TOR D	104.34	-0.103	0.203	0.02	0.658	0.010	0.024
TOR E	113.65	-0.023	0.077	0.03	0.584	0.002	0.007
TOR H	113.65	-0.046	0.077	0.00	0.532	-0.001	0.009
TRADE A	181.20	-0.295	0.209	0.00	0.714	-0.011	0.018
TRADE D	182.03	-0.240	0.141	3.97	0.813	-0.016	0.016
TRADE E	197.64	-0.052	0.049	19.34	0.869	0.007	0.005
TRADE H	198.48	-0.087	0.096	0.03	0.554	0.001	0.008
URBAN A	181.20	-0.800	0.340	26.37	0.886	-0.089	0.063
URBAN D	182.03	-0.799	0.231	24.71	0.859	-0.076	0.056
URBAN E	197.64	-0.187	0.113	0.98	0.540	0.001	0.016
URBAN H	198.48	-0.211	0.249	10.01	0.750	0.018	0.025

For each seigniorage measure, the results are based on 6545 regressions. A constant term is included in the regressions. The results are based on White (1980) heteroscedasticity consistent standard errors.

Table 6: Factor score predictions

1980-1984		1985-1989		1990-1994		1995-1999	
Country	Factor Score	Country	Factor Score	Country	Factor Score	Country	Factor Score
ISRAEL	4.76944	NICARAGUA	8.34844	CONGO. (DR)	5.57711	CHINA.P.R.:	0.97463
ARGENTINA	3.07865	PERU	2.96661	NICARAGUA	2.91656	BULGARIA	0.90146
CONGO. (DR)	2.95571	ARGENTINA	2.48751	BRAZIL	1.94799	ALBANIA	0.67298
MEXICO	1.63416	IRAN. I.R. OF	2.04727	CHINA.P.R.:	1.77788	IRAN. I.R. OF	0.51234
GHANA	1.63257	CHILE	1.84175	PERU	1.7282	TURKEY	0.4074
PERU	1.53092	BOLIVIA	1.63581	CHILE	1.50234	HAITI	0.3078
CHILE	1.45333	URUGUAY	1.62409	BULGARIA	1.00774	COSTA RICA	0.22698
UGANDA	1.23315	SYRIAN ARAB REP.	1.27738	ROMANIA	0.93503	CHILE	0.21867
EGYPT	1.15141	BRAZIL	0.99902	JORDAN	0.88714	ROMANIA	0.18796
IRAN. I.R. OF	1.11071	ZAMBIA	0.86131	COSTA RICA	0.80016	VENEZUELA. REP.	0.18428
COSTA RICA	0.99268	CONGO. (DR)	0.82772	ARGENTINA	0.79989	NEPAL	0.16414
NICARAGUA	0.90928	ISRAEL	0.72897	SYRIAN ARAB REP.	0.77537	INDONESIA	0.09413
URUGUAY	0.65666	PARAGUAY	0.70965	NEPAL	0.56644	NICARAGUA	0.08831
CYPRUS	0.58111	COSTA RICA	0.70892	TURKEY	0.44488	CZECH REP.	-0.02394
GREECE	0.56081	TURKEY	0.70613	IRAN. I.R. OF	0.43235	INDIA	-0.03123
TURKEY	0.52994	JORDAN	0.41977	PARAGUAY	0.40718	URUGUAY	-0.0596
JORDAN	0.45254	GHANA	0.39956	EGYPT	0.33421	PERU	-0.07792
SPAIN	0.43545	NEPAL	0.33531	VENEZUELA. REP.	0.274	PAKISTAN	-0.12336
ICELAND	0.42203	MEXICO	0.3296	KENYA	0.23521	EGYPT	-0.13581
MALTA	0.40349	EGYPT	0.30475	DOMINICAN REP.	0.23003	PHILIPPINES	-0.15887
PHILIPPINES	0.39354	NIGERIA	0.12796	INDIA	0.1721	THAILAND	-0.16398
PORTUGAL	0.29849	INDIA	0.11959	PAKISTAN	0.16375	ESTONIA	-0.16968
PARAGUAY	0.29789	PORTUGAL	0.07951	MALTA	-0.03323	GREECE	-0.17791
NEPAL	0.18153	PAKISTAN	-0.02367	MALAYSIA	-0.04944	MEXICO	-0.18669
HAITI	0.067	GREECE	-0.03221	GHANA	-0.07353	ISRAEL	-0.19989
INDIA	0.02804	SPAIN	-0.09103	GREECE	-0.07828	ZIMBABWE	-0.21929
PAKISTAN	-0.00054	MAURITIUS	-0.18883	PHILIPPINES	-0.1156	SYRIAN ARAB REP.	-0.30021
BRAZIL	-0.00445	PHILIPPINES	-0.20748	SRI LANKA	-0.12001	COLOMBIA	-0.30301
ITALY	-0.09704	MOROCCO	-0.27359	CYPRUS	-0.12162	SLOVAK REP.	-0.30448
SRI LANKA	-0.11961	ICELAND	-0.28507	MAURITIUS	-0.1663	BURUNDI	-0.31194
SINGAPORE	-0.29418	SRI LANKA	-0.30785	HUNGARY	-0.1694	LITHUANIA	-0.32312
MOROCCO	-0.30222	VENEZUELA. REP.	-0.32398	ECUADOR	-0.22745	DENMARK	-0.34107

1980-1984		1985-1989		1990-1994		1995-1999	
Country	Factor Score	Country	Factor Score	Country	Factor Score	Country	Factor Score
MAURITIUS	-0.33563	ITALY	-0.3344	ZIMBABWE	-0.28609	POLAND	-0.34476
SWITZERLAND	-0.38586	KENYA	-0.33447	MOROCCO	-0.28824	HUNGARY	-0.35463
INDONESIA	-0.40481	CYPRUS	-0.38745	ISRAEL	-0.35219	MOROCCO	-0.37677
THAILAND	-0.4089	THAILAND	-0.39636	THAILAND	-0.36811	KENYA	-0.40899
MALAYSIA	-0.42116	SINGAPORE	-0.42504	MEXICO	-0.42336	SRI LANKA	-0.41683
ZIMBABWE	-0.43312	JAPAN	-0.44933	SWEDEN	-0.43294	BOLIVIA	-0.44342
CAMEROON	-0.43641	MALAYSIA	-0.4498	SINGAPORE	-0.44256	TUNISIA	-0.45517
IRELAND	-0.47949	HUNGARY	-0.45368	CONGO. REP. OF	-0.44469	IRELAND	-0.46391
JAPAN	-0.48558	HAITI	-0.46578	INDONESIA	-0.4565	CROATIA	-0.49535
GUATEMALA	-0.48825	ZIMBABWE	-0.47241	TUNISIA	-0.52064	MALAYSIA	-0.50098
KENYA	-0.4937	INDONESIA	-0.47767	SWITZERLAND	-0.54193	COTE D IVOIRE	-0.50702
ECUADOR	-0.56206	TUNISIA	-0.53355	GERMANY	-0.60863	SWITZERLAND	-0.52525
KUWAIT	-0.56571	ECUADOR	-0.57806	BOTSWANA	-0.62105	MAURITIUS	-0.54356
AUSTRALIA	-0.57156	SWEDEN	-0.59	DENMARK	-0.62884	SLOVENIA	-0.55808
FRANCE	-0.59872	GERMANY	-0.60456	JAPAN	-0.64717	SPAIN	-0.56306
UNITED STATES	-0.60503	UNITED STATES	-0.60472	AUSTRALIA	-0.66022	BELGIUM	-0.56846
NORWAY	-0.62784	AUSTRALIA	-0.60718	ITALY	-0.66177	SINGAPORE	-0.56927
CANADA	-0.63283	IRELAND	-0.61737	IRELAND	-0.68511	CONGO. REP. OF	-0.59013
BELGIUM	-0.64759	BOTSWANA	-0.62242	NETHERLANDS	-0.69084	UNITED STATES	-0.59486
SWEDEN	-0.65714	DENMARK	-0.6286	CANADA	-0.69129	NORWAY	-0.60844
GERMANY	-0.67347	UNITED KINGDOM	-0.63906	NORWAY	-0.69228	CYPRUS	-0.61365
DENMARK	-0.67921	CAMEROON	-0.64403	UNITED KINGDOM	-0.70158	ICELAND	-0.62221
NEW ZEALAND	-0.68154	CANADA	-0.65467	NEW ZEALAND	-0.73014	CANADA	-0.64695
BOTSWANA	-0.71443	MALTA	-0.65744	FRANCE	-0.73863	AUSTRALIA	-0.66321
UNITED KINGDOM	-0.71562	FRANCE	-0.66576	ICELAND	-0.74304	NEW ZEALAND	-0.66616
LUXEMBOURG	-0.79615	NETHERLANDS	-0.67632	BELGIUM	-0.74492	CAMEROON	-0.67617
		NORWAY	-0.69061	CAMEROON	-0.76286	FRANCE	-0.68378
		NEW ZEALAND	-0.69596	SPAIN	-0.83547	PORTUGAL	-0.69308
		BELGIUM	-0.70361	PORTUGAL	-0.83893	GERMANY	-0.70235
		LUXEMBOURG	-0.72822			KUWAIT	-0.70581
		CHAD	-1.2139			ARGENTINA	-0.74549
						NETHERLANDS	-0.75427
						JORDAN	-0.75771
						ITALY	-0.85616
						MALTA	-0.89366
						SWEDEN	-0.97865

Table 7: Extreme Bounds Analysis using PCA

All Countries							$\pi < 100\%$					
Variable	Lower bound	Upper bound	% with sign. β	Unw. CDF	Unw. β	Unw. stand. error	Lower bound	Upper bound	% with sign. β	Unw. CDF	Unw. β	Unw. stand. error
AGRI	-7.685	11.310	9.44	0.830	1.241	1.116	-6.522	7.321	13.14	0.870	0.948	0.745
ALLHOUSE	-0.515	1.260	8.92	0.881	0.232	0.174	-0.539	0.613	0.00	0.663	-0.044	0.104
BUREAU	-0.783	0.641	22.03	0.886	-0.122	0.085	-0.287	0.900	4.83	0.704	-0.030	0.047
CDEBT	-4.141	1.772	69.20	0.923	0.627	0.193	-4.168	1.301	0.69	0.542	-0.030	0.170
CORRUPTION	-0.898	0.970	27.29	0.783	0.097	0.078	-0.803	0.270	49.52	0.937	-0.086	0.044
DEMACC	-0.504	0.538	5.06	0.780	-0.068	0.076	-0.315	0.763	6.08	0.669	-0.023	0.043
EASIA	-3.747	3.676	0.00	0.615	0.136	0.392	-3.000	5.223	0.18	0.669	0.147	0.321
ETHNIC	-0.741	0.435	4.66	0.686	-0.038	0.063	-0.720	0.327	34.18	0.794	-0.041	0.036
EXECNAT	-1.989	2.090	0.73	0.696	-0.157	0.265	-1.160	1.547	0.31	0.641	0.065	0.168
EXECREG	-5.258	4.273	0.00	0.598	-0.208	0.725	-5.314	7.155	0.00	0.542	-0.051	0.514
EXECRLC	-1.861	1.303	0.02	0.555	-0.044	0.214	-0.820	1.319	15.57	0.903	0.153	0.108
EXECRURL	-5.815	4.917	0.00	0.643	0.367	0.937	-3.291	2.159	0.00	0.573	0.076	0.485
EXECSPEC	-1.737	1.754	0.00	0.611	-0.065	0.210	-0.855	1.343	0.34	0.757	0.101	0.125
EXTCON	-0.234	0.196	71.09	**0.955**	-0.079	0.033	-0.140	0.185	50.65	0.924	-0.035	0.019
FRAC	-4.360	3.709	0.20	0.759	-0.264	0.351	-3.190	1.449	0.15	0.731	-0.137	0.208
GASTIL	-2.705	4.246	0.60	0.536	-0.041	0.381	-1.296	3.319	1.19	0.593	-0.061	0.236
GINI	-0.163	0.093	0.63	0.539	0.000	0.010	-0.140	0.083	0.24	0.589	0.002	0.011
GOVSTAB	-0.227	0.289	9.30	0.814	-0.039	0.038	-0.132	0.239	24.98	0.821	-0.024	0.020

A constant term is included in the regressions. The results are based on White (1980) heteroscedasticity consistent standard errors.

Table 8: Extreme Bounds Analysis using PCA

All Countries							$\pi < 100\%$					
Variable	Lower bound	Upper bound	% with sign. β	Unw. CDF	Unw. β	Unw. stand. error	Lower bound	Upper bound	% with sign. β	Unw. CDF	Unw. β	Unw. stand. error
GROWTH	-24.834	14.282	74.35	0.924	-5.505	2.396	-5.236	13.242	9.81	0.737	1.192	1.451
ILLIT	-8.193	9.369	0.41	0.596	0.222	0.848	-3.725	9.586	26.98	0.886	0.959	0.680
INDUST	-8.268	6.763	0.00	0.589	-0.261	1.173	-4.722	10.467	8.89	0.714	0.637	0.790
INTCON	-0.353	0.212	72.86	**0.967**	-0.090	0.036	-0.192	0.180	75.28	**0.955**	-0.052	0.021
LATINCA	-3.441	3.480	44.61	0.941	0.473	0.272	-3.302	3.373	9.29	0.799	0.196	0.227
LAW	-0.567	0.531	46.04	0.907	-0.120	0.069	-0.322	0.326	55.83	0.909	-0.070	0.039
LOGDENS	-1.937	1.572	0.41	0.673	-0.058	0.115	-1.961	1.109	15.42	0.839	-0.178	0.134
MANU	-12.218	9.351	0.26	0.577	0.375	1.701	-5.337	11.896	18.93	0.746	1.104	1.128
MILITARY	-1.809	1.259	3.71	0.695	0.144	0.251	-1.266	1.147	3.85	0.639	0.066	0.162
MILPOL	-0.323	0.503	21.10	0.840	-0.076	0.061	-0.436	0.249	63.99	**0.958**	-0.081	0.036
POLARIZ	-0.727	0.901	1.38	0.520	-0.009	0.119	-0.717	0.872	1.73	0.568	-0.010	0.071
PRTYIN	-0.050	0.047	0.00	0.770	0.006	0.007	-0.025	0.036	0.00	0.600	0.001	0.004
RELPOL	-0.606	0.895	10.40	0.815	-0.079	0.073	-0.593	0.399	43.30	0.905	-0.075	0.044
STABNS	-2.214	2.158	0.72	0.753	0.328	0.450	-1.697	1.891	4.63	0.814	0.256	0.252
SUBAFR	-4.147	3.615	6.74	0.876	-0.416	0.346	-4.986	3.559	34.36	0.940	-0.441	0.276
TOR	-1.188	2.756	11.87	0.825	0.337	0.333	-0.955	2.413	0.02	0.679	0.103	0.207
TRADE	-3.257	1.512	0.02	0.619	0.053	0.210	-2.250	1.416	0.00	0.521	0.007	0.143
URBAN	-5.370	4.680	0.99	0.657	0.280	0.649	-6.850	2.762	11.37	0.803	-0.520	0.507

A constant term is included in the regressions. The results are based on White (1980) heteroscedasticity consistent standard errors.

Table 9: Summary of the Empirical Literature (provisional, incomplete version

Study:	Seigniorage measure:	Economic Variables: included:	Effect:	Political Variables included:	Effect:
Al Marhubi (2000)	π	trade gdpcap	- 0	corruption tor asia latinca	+ + - 0
Aisen and Vega (2002?)	log π_t- logπ_{t-1}	agriculture trade growth overvalue currency oil prices	0 + - - +	size of government cabinet change secure property rights access to sound money freedom to exchange with foreigners regulation of credit labor and business government crisis polity	0 0+ 0 + - - + +
Berument (1998)	log M0 growth log π	growth tax income log government expenditures	+ + -	legal cbi	-
Bhattacharya et al. (2004)	E	gdp level 1960 financial depth	0 +	gini $gini^2$ literacy gastil government fractionalization socialist government fraction elderly	- + 0 0 0 0 0
Caplan (2002)					
Click (1998)	log A, log E	gnpcap log agricultural employment log industrial employment income taxes trade taxes log government expenditures creditworthiness index central government debt	- 0 + 0 0 + + 0	tor legal cbi political instability	+ 0 +

Study:	Seigniorage measure:	Economic Variables: included:	Effect:	Political Variables included:	Effect:
Cukierman et al. (1992)	A (D, E, H)	agriculture manufacturing trade gdpcap urbanization industry	+ 0 - - + -	political instability coups government transfers asia	+ + + 0
De Haan et al. (1993)	E,H	agriculture trade gdpcap government expenditures cdebt indebtedness dummy peg	+ - + + + + 0		
Desai et al. (2003)	$\frac{\pi}{1+\pi}$	log gdpcap trade growth fiscal deficits financial depth	0 0 - - 0, -	tor political instability gini democracy gini*democracy gini/democracy with interaction	0 0 + + + -
Fischer et al. (2003)	E	fiscal deficits	+		
Gasiorowski (2000)					
Kenny and Winer (2001)	A	total revenue trade gdp per capita urbanization female labor participation log density oil prices	- - 0 +, 0 +, 0 0 -	coups gastil socialism	0 + 0

Table 10: Variable Definitions and Data Sources

Variable:	Definition and Source:
AGRI	Agriculture, value added (% of GDP) Source: World Bank Development Indicators (WDI)
ALLHOUSE	Dummy whether the executive's party controls all houses Source: DPI (Beck et al. 2001)
BUREAU	Bureaucracy quality. Assesment of the institutional strength and quality of the bureaucracy. Range: 0-4. Source: ICRG
CDEBT	Central government debt, total (% of GDP). Source: WDI
CORRUPTION	Corruption. Assesment of corruption within the political system. Source: ICRG
DEF	Overall budget balance, including grants (% of GDP). Range: 0-6. Source: WDI
DEMACC	Democratic accountability. Measure of how responsive a government is to its people. Range: 0-6. Source: ICRG
DUM80	Dummy variable for the period 1980-1984
DUM85	Dummy variable for the period 1985-1989
DUM90	Dummy variable for the period 1990-1994
EASIA	Dummy variable for East Asian countries (according to World Bank definition).
ETHNIC	Ethnic Tensions. Assesment of the degree of tension within a country attributable to racial, nationality or language divisions. Range: 0-6. Source: ICRG
EXTCON	External conflict. Risk to incumbent government from foreign action components:war, cross-border conflict, foreign pressures. Range: 0-12. Source: ICRG
EXECNAT	Dummy variable taking the value 1 if the party of the chief executive is nationalistic and 0 otherwise. Source: DPI (Beck et al. 2001)
EXECRLC	Dummy variable taking the value 1 if the party of the chief executive is a right-wing party and 0 if the party is left. Source: DPI (Beck et al. 2001)
EXECRURL	Dummy variable taking the value 1 if the party of the chief executive is rural and 0 otherwise. Source: DPI (Beck et al. 2001)
EXECSPEC	Dummy variable taking the value 1 if the party of the chief executive is a special interest party and 0 otherwise. Source: DPI (Beck et al. 2001)
EXPROP	Risk of exproptiation by the government Source: ICRG
FRAC	Total Fractionalization, probability that 2 random draws will produce legislators from different parties. Source: DPI (Beck et al. 2001)
GASTIL	Gastil index. (14 - civil liberties - political freedom)/12. Source: www.freedomhouse.org
GDPCAP	GDP per capita (constant 1995 US$). Source: WDI
GINI	Gini coefficient of income inequality. Source: Deininger and Squire (1996)
GOVSTAB	Government Stability. Ability of governments declared program and ability to stay in office. Range: 0-12. Source: ICRG
GROWTH	Real GDP growth (in %)
ILLIT	Illiteracy rate adult total (% of people ages 15 and above). Source: WDI
INDUST	Industry, value added (% of GDP). Source: WDI

Variable:	Definition and Source:
INTCON	Internal conflict. Political violence within countries and (potential) impact on governance. Components are: civil war/coup threat, political violence/terrorism, civil disorder. Range: 0-12. Source: ICRG
LATINCA	Dummy variable for Latin-America and the Carribean (according to World Bank definition).
LAW	Law and order. Measures strength and impartiality of the Law system + assesment of popular observance of the law. Range: 0-6. Source: ICRG
LDC	Dummy variable for Least Developed Countries (according to World Bank definition).
LOGDENS	Log of Population density (people per sq km). Source: WDI
MANU	Manufacturing, value added (% of GDP). Source: WDI
MILPOL	Military in politics. Assesment of the involvement of the military in politics. Range: 0-6. Source: ICRG
MILITARY	Dummy variable taking the value 1 if the chief executive is a military officer and 0 otherwise. Source: DPI (Beck et al. 2001)
OECD	Dummy variable for High Income OECD countries (according to World Bank definition).
OPEC	Dummy variable for OPEC countries. Source: www.opec.org
PEG	Indicator for de facto exchange rate regime. 0=flexible, 1= not or less flexible. Source: Reinhart and Rogoff (2004).
POLARIZ	Polarization: maximum difference of orientation between government parties range: 0-2. Source: DPI (Beck et al. 2001)
PRTYIN	Number of years that the chief executives' party is in office.
RELPOL	Religion in politics. Measure indicates to what extent religious groups try to dominate other religious groups in politics. Range: 0-6. Source: ICRG
STABNS	Political stability. % of veto players dropping from government assuming Senate does not change. Source: Database of Political Institutions (Beck et al. (2001))
SUBAFR	Dummy variable for Sub-Saharan African Countries (according to World Bank definition).
TAX	Tax revenue (% of GDP). Source: WDI
TOR	Turnover rate. Average amount of Central Bank Governor turnovers per year. Source: Sturm and de Haan (2001)
TRADE	Total exports and imports (% of GDP). Source: WDI
URBAN	Urban population is the share of the total population living in areas, defined as urban in each country. Source: WDI

Table 11: List of Countries per Seigniorage Measure

Measure: A. (85 countries)
Albania, Argentina, Australia, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Burundi, Cameroon, Canada, Chad, Chile, China, Colombia, Dem. Republic of Congo, Republic of Congo, Costa Rica, Cote D'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, France, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Guyana, Haiti, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Jordan, Kenya, Kuwait, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway,Pakistan, Paraguay, Peru, Phillipines, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Uganda, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe

Measure: D. (82 countries)
Albania, Argentina, Australia, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Burundi, Cameroon, Canada, Chad, Chile, China, Colombia, Dem. Rep. of Congo, Republic of Congo, Costa Rica, Cote, D'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, France, Germany, Ghana, Greece, Guatemala, Haiti, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Jordan, Kenya, Kuwait, Lithuania, Luxembourg, Malaysia, Malta, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Paraguay, Peru, Phillipines, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe

Measure: E. (95 countries)
Albania, Algeria, Argentina, Australia, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Burundi, Cameroon, Canada, Chad, Chile, China, Colombia, Dem Rep. of Congo, Republic of Congo, Costa Rica, Cote D'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Guyana, Haiti, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Kuwait, Latvia, Lithuania, Luxembourg, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Paraguay, Peru, Phillipines, Poland, Portugal, Romania, Russia, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Thailand, Togo, Tunisia, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe

Measure: H. (92 countries)
Albania, Algeria, Argentina, Australia, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Burundi, Camroon, Canada, Chad, Chile, China, Colombia, Dem Rep. Congo, Republic of Congo, Costa Rica, Cote D'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Haiti, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Kuwait, Latvia, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Paraguay, Peru, Phillipines, Poland, Portugal, Romania, Russia, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Thailand, Togo, Tunisia, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe