



Kleptocracy and Its Relation to Economic Performance: The Case Study of Congo

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Abstract: Researchers have attributed the low productivity growth rates of African agricultural sector to many factors including weather patterns, growing conditions, institutions and other economic factors; however, it is reasonable to assume that individual leaders' decisions can impede the economic growth and development in weakly institutionalized countries. This early public policy "Zairianization" has impaired the economic performance of the Congo. This case study illustrates such effect on Congo's agricultural sector. Results suggest that the total loss tapped \$160.34 billion from 1974 to 2009 with an annual average loss of \$5.5 billion (28 percent of GDP). The loss ranges from \$3.02 billion to \$ 5.5 billion.

JEL Codes: C13, C21, D24, O47

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I. Introduction and Literature Review

Researchers have explained how institutions shape individual behaviors, the way society evolve and affect economic performance (North, 1990; North and Weingast, 2004; Boettke et al., 2005; Boettke and Fink, 2011). This study discusses how a lack of commitment to or enforcement of the constitutional arrangement and ease of changing or revising the constitutions have significant impact on the performance of a country compared to places where one is tied by the constitution to commit to or abide by the constitutional arrangement (North and Weingast, 2004). Jones and Olken (2005) conclude that "individual leaders can play crucial roles in shaping the growth of nations." The 1965-1997 Mobutu's presidency in the Congo is one of the best illustrations. In his book entitled, "The Next Decade: Where We've Been ...and Where We're Going", Friedman (2011, pp.1-2) stresses that

"...human beings don't live in the long run. We live in the much shorter span in which our lives are shaped not so much by vast historical trends by the specific decisions of specific individuals...But in the shorter time frame of a decade, individual decisions made by individual people, particularly those with political power, can matter enormously...A decade is the point at which history and statesmanship meet, and a span in which policies still matter."

Acemoglu et al. (2004) provide examples of kleptocracy around the world, which include the Democratic Republic of Congo under SeseSeko Mobutu, the Dominican Republic under Rafael Trujillo, Haiti under the Duvaliers, Nicaragua under the Somozas, Uganda under Idi Amin, Liberia under Charles Taylor, and the Philippines under Ferdinand Marcos. The Congolese case becomes the classical example of kleptocracy under Mobutu regime (Acemoglu et al., 2004) and little is known about losses incurred by the Congo.



It should be noted that the best research effort should enhance the understanding of the role of constitutional economics and its relation to the economics of development in Congo in particular. That is, I shall initiate a research program, which articulates the discourse of economic growth and development in problem solving terms through the lens of constitutional economics framework in the lieu of the widespread management of monetary and fiscal policies (Boettke and Fink, 2011), which impede the overall performance of the Congo.

Congo has record low in several socioeconomic indicators as shown by major international datasets (2014 World Development Indicators, Penn World Table, Versions 7.1-8.0, and Gapminder World to name a few). When compared with other African countries, Congo is among the lowest in the continent despite its natural mineral endowment and good growing conditions. The review of previous studies suggests that economic losses in relation to public policy has not been satisfactorily measured in applied research in Africa and Congo in particular. The counterfactuals, productive efficiency scores, those showing what a country would have been able to achieve in the absence of kleptocracy policies based on its previous performance, are missing. This study seeks to estimate those counterfactuals, and to answer the question: to what extent would the observed productive efficiency scores have been different in the absence of kleptocracy? In general terms I estimate the counterfactual productive efficiency scores of Congo by examining similar but not listed as the case of kleptocracy in the literature. These countries form the *donor pool* or control

group because they did not experience kleptocracy during the period under study.¹

In experimental studies the researcher randomly creates two groups, the treated group and the control group, and the treatment effects are extrapolated by design. In observational studies, as in this paper, randomized experimental design is not an option. In the design phase of this study, I follow the Rubin causal model (1977; 1978), which introduces the notion of the treatment assignment and its relation with the potential outcomes, written as, $Y(0)$ and $Y(1)$, for the observed and counterfactual outcomes, respectively. Based on the Rubin's potential outcomes approach, the causal effect is defined as the difference, the missing outcomes, $\alpha = E[Y(0) - Y(1)]$ and it lends the possibility of a placebo test to validate the results. Abadie et al. (2003, 2010) introduce the synthetic control method as an estimation strategy in historical event and policy intervention studies imbedded in the potential outcomes framework. This data-driven approach is used to reproduce past values of the synthetic control most similar to the observed values of the affected country. The next section describes the data and the methodology while section 3 discusses the results. Finally, section 4 summarizes the main findings and provides the concluding remarks.

II. Data and Methodology

Two datasets are used for this study. First, the series of productive efficiency scores is from Rezek et al. (2011) and was updated from 2007 to 2009. The second dataset is composed of the population density (per squared kilometer),

¹ Other African countries excluding Democratic Republic of Congo, Liberia and Uganda. To have a complete list of countries that experienced kleptocracy, Acemoglu, Robison, and Verdier, 2004 list the Dominican Republic, Haiti, Nicaragua besides three African countries.

openness to trade were collected from the World Development Indicators database maintained by the World Bank and the rainfall was obtained from the world climate data maintained by the World Bank. This event-study application aims at measuring agricultural production loss due to kleptocracy in Congo and a sample of donor pools. I apply the synthetic control model (Abadie and Gardeazabal, 2003; Abadie et al., 2010) to estimate the impacts of kleptocracy by comparing the agricultural production of an affected country (Y_{it}) to the agricultural production for a generated control group (Y_{it}^N). The outcomes estimated by this synthetic control group are assumed to be unaffected by the kleptocracy or bad policy choices.

The modeling strategy and notation presented below follows that of Abadie and Gardeazabal (2003) and Abadie et al. (2010). In this study, assume there are $J+1$ countries ($i = 1$ to $J+1$). The first country is exposed to kleptocracy or has experienced a bad policy while the remaining J countries are not affected by such events. Likewise, consider two periods: pre-kleptocracy lasting from $t = 1$ to T_0 , and post-kleptocracy, lasting from $t = T_0+1$ to T . Assume a dummy variable (D_{it}) can be used to split the countries into those exposed to kleptocracy, $D_{it} = 1$, and those not exposed to kleptocracy, $D_{it} = 0$. In this formulation:

$$D_{it} = \begin{cases} 1 & \text{if } i = 1 \text{ and } t > T_0, \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

The observed agricultural production level for a country at time t is presented in the following model:

$$Y_{it} = Y_{it}^N + \alpha_{it} D_{it} \quad (2)$$

Where Y_{it} represents the observed agricultural production level irrespective of kleptocracy, and Y_{it}^N represents the unobserved counterfactual

agricultural production to be estimated using the synthetic control method. The term α_{it} measures the effect of kleptocracy on agricultural production for a country at time t . Rearranging equation 2 gives:

$$D_{it} \alpha_{it} = Y_{it} - Y_{it}^N \quad (3)$$

Prior to or in the absence of kleptocracy or bad policy $D_{it} = 0$ and counterfactual agricultural production for a country is equal to observed agricultural production. However, when kleptocracy occurs $D_{it} = 1$ and the gap between observed agricultural production and the unobserved “good governance counterfactual” is given by α_{it} . This “good governance” counterfactual agricultural production, Y_{it}^N , is unobservable, but is estimated here using the synthetic control method (see Abadie and Gardeazabal, 2003 and Abadie et al., 2010 for more details).

The optimal combination of weights $\{w_2 \dots w_{J+1}\}$ is estimated and its estimate, the W^* vector is then combined with observed data from the unaffected countries for years T_0+1 to T to create a good governance counterfactual. The estimated counterfactual agricultural production is obtained as:

$$Y_{it}^N = \sum_{i=2}^{J+1} w_i^* Y_{it} \text{ for } t = T_0 + 1 \text{ to } T \quad (4)$$

The result above retrieves the agricultural production that would have been observed under good governance scenario. To estimate the impact of kleptocracy on agricultural production in a selected country ($D_{it} = 1$), I substitute the counterfactual in equation (4) into equation (3); this yields,

$$\hat{\alpha}_{it} = Y_{it} - \sum_{i=2}^{J+1} w_i^* Y_{it} \text{ for } t \in \{T_0 + 1, \dots, T\} \quad (5)$$

The loss in productive efficiency can then be calculated as the difference between



counterfactual efficiency scores and actual efficiency scores. The resulting figure indicates the level of expected efficiency scores if previous efficiency levels could have been maintained. I conduct several Placebo tests to empirically validate the estimated loss.

III. Results

The case study deals with the estimation of the economic loss due to kleptocracy, a classical example, the Democratic Republic of Congo under Mobutu regime (See Acemoglu et al, 2004 for more details). The early post-independence era has been marked by a military coup d'état in 1965, the change of the constitution in 1967 towards divide-and-rule strategy, followed by the harbinger of kleptocracy in 1973. The study shows how kleptocracy can be disastrous on the entire economy by adopting inefficient economic policies, expropriating the wealth of domestic and foreign investors, using foreign development assistance, aid and natural resources for enrichment of political elites but also on agricultural sector home of more 70 percent of labor force. The treatment period of this study 1974 because I allow for a lag effect of the nationalization campaign called *Zairinization*. Through this campaign, farms, ranches, plantations, concessions, commerce, and real estate will be handed over to the sons of the country – own political cronies and family members who became the owners of these private properties without any prior agribusiness, corporate or sector experience. According to some researchers and analysts, this policy destroyed what was left after a collapse of the Congolese economy as the results of the adoption of economic bad policies and mismanagement. Frequent looting, tactic of rape, lack of access to finance, and the disruption of transportation

network have altered small agribusiness holders and local farmers' incentives. Productive efficiency declined to just fewer than percent 70 percent in the late 1960s. However it began to dip in the mid-1970s and stayed in descending path followed by a flat until a small rebound occurred in the late 1980s. A sweeping plunge started in the mid-1990s with little prospect of recovery as of 2009. I systematically estimate the effects of kleptocracy on agricultural production by deriving the 'good governance' counterfactual agricultural production using the synthetic control method. That is, I obtain the synthetic Congo by means of the convex combination of African countries in the donor pool which closely mimics the past values of the agricultural sector performance before 1974.

Figure 1 displays the trends in productive efficiency in Congo and the rest of African countries. This figure shows that the average of the rest of countries in Africa may not provide an adequate control group for Congo to estimate the effects of kleptocracy on the agricultural sector productive efficiency.

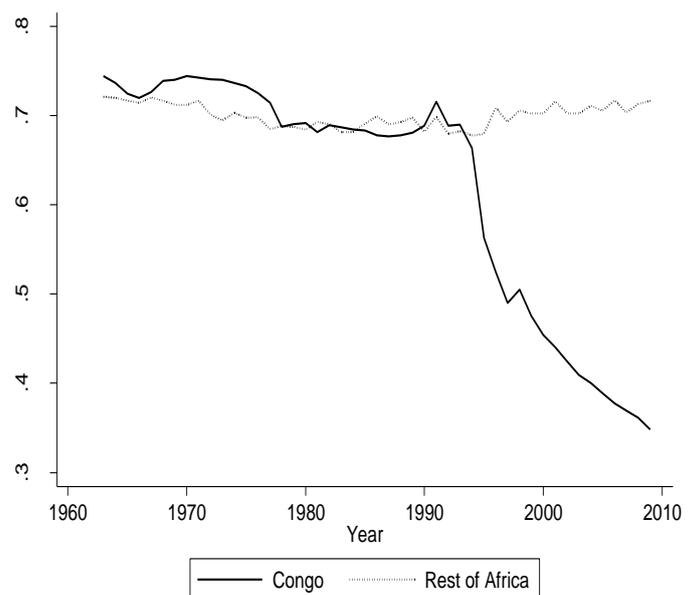


Figure 1: Trends in productive efficiency: Congo vs. Rest of Africa excluding Angola



Levels of productive efficiency were not similar in Congo and in the rest of Africa in the early 1960s and 1970s. Despite the fact that the rest of Africa had low efficiency scores in the 1960s and 1970s on average, the trend in Congolese productive efficiency was fairly close to the rest of Africa average starting from the late 1970s up to the early 1990s. The Congolese productive efficiency continued to decline over time.

The question that arises here is that how productive efficiency would have been in Congo after 1973 in the case of secure property rights, protection of wealth, and no confiscatory government. The synthetic control method is the systematic way of estimating the missing productive efficiency which I refer here as a counterfactual productive efficiency. I systematically estimate the effects of bad policymaking on the Congolese agricultural productive efficiency by deriving the stable democracy counterfactual productive efficiency using the synthetic control method. That is, I obtain the synthetic Congo by means of the convex combination of African countries in my donor pool which closely mimic the past values of the agricultural sector productive efficiency before 1973 using three predictors, the population density, openness to trade, and rainfall. The results indicate that trade openness, rainfall, and population density have substantial power in predicting the Congolese agricultural sector performance. I also note that the real Congo predictor means and that of the donor pool are different. That is, the synthetic Congo properly reproduces the values that the productive efficiency had in Congo before kleptocracy. The values of openness to trade, population density, and rainfall are almost the same as that the counterfactual productive efficiency (see Table 4).

Results show that the relative contribution of each control country in the synthetic Congo.

Based on the weights reported below, the productive efficiency trend in Congo prior to kleptocracy is best reproduced by a combination of the following countries in order: Cameroon (0.694), Gabon (0.134), and Burkina Faso (0.172). Other countries in the donor pool have zero weights.

Figure 2 displays the productive efficiency for Congo and its synthetic version during the period 1962-2009. I note that in contrast to other African countries average productive efficiency which is away from the actual productive efficiency in Congo, productive efficiency in the synthetic Congo fairly reproduces the past trajectory of the agricultural productivity in Congo for the pre-treatment period. That is, the synthetic Congo provides a reasonable approximation to the productive efficiency levels that would have been attained in Congo between 1973 and 2009 in the case of good polices and successful democracy such as Botswana and Mauritius. These two countries provide a good illustration of civilian governance.

The estimate of the effect of kleptocracy on productive efficiency in Congo is the difference between the actual productive efficiency and in its synthetic version after 1973. Immediately after, solid and dot lines are extremely close. They started noticeably to diverge in the mid-1970s. The estimate of the loss in productive performance of the Congolese agricultural sector as the results of the political disruption is the difference between the productive efficiency in the treated Congo and its synthetic version after 1973. Figure 2 displays the Congolese agricultural performance and that of the synthetic country (synthetic Congo DRC) as a comparison country from 1962 to 2009 with a treatment year in 1973. This figure shows that the productive efficiency of Congo diverges right after 1974 while the synthetic country achieves high productive

efficiency decline over the years. The average loss in productive efficiency totals 19.5 percent from 1974 to 2009.

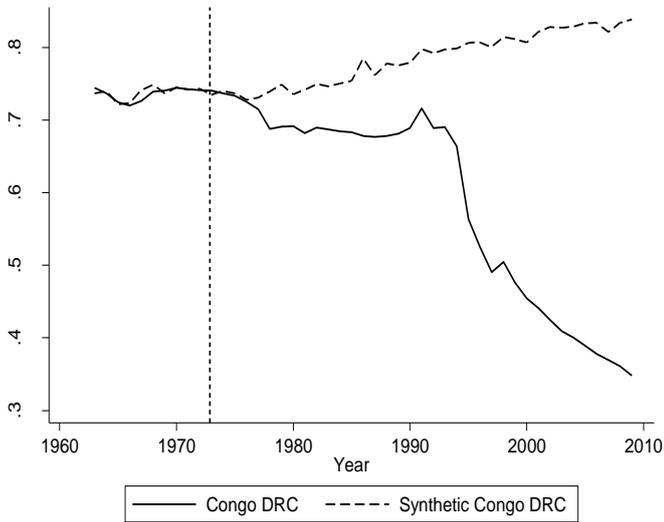


Figure 2: Trends in productive efficiency: Congo vs. Synthetic Congo

The productive efficiency began to largely diverge since 1974 from the synthetic Congo. In effect, the Congolese agricultural sector performance starts diving slowly from 1.5 percent in 1974 to 49.09 percent in loss in productive efficiency in 2009. This performance is not surprising in such an environment. The empirical literature of the effects of institutions and policies on the economic outcomes suggests poor economic performance (Easterly 2008; Easterly et al., 2006; Alesina and Matuszeski 2011; Acemoglu et al., 2004) and the political economy literature highlights low average economic productivity in kleptocracy.

Inference about the causal effect of Kleptocracy

To evaluate the statistical significance of the estimate, it is important to ask the question of whether the results could be driven by chance. Following Abadie et al.(2010), the Placebo tests allow me to apply the synthetic method to countries that did not experience the event,

namely, the onset of kleptocracy in Congo in 1973 respectively. I implement this procedure by assuming that one of the countries in the donor pool would have experienced kleptocracy in 1973 instead of Congo. I implement the placebo test in order to evaluate the significance of the estimates using the graphic analysis of the distribution of gaps estimated iteratively during the placebo test procedure as well as the comparison of the mean squared prediction errors. I then calculate the gap between the observed productive efficiency and the counterfactual productive efficiency for each placebo run. It is important to note that the gaps between productive efficiency and its synthetic version should be unusually large to be significant relative to the gaps for the countries that did not experience the political disruption or bad policies.

In such a case, the analysis provides significant evidence of the negative effect of kleptocracy on productive efficiency in Congo. This iterative procedure yields a distribution of estimated gaps for the countries, which did not experience kleptocracy. Another way of evaluating the significance of the results is to obtain the distribution of the ratios of post/pre-treatment mean squared prediction error. The ratio for the treated country should so large that no control states can achieve such a larger ratio. In case of random assignment of the treatment in the data, the probability of reaching a post-pretreatment means square prediction error ratio as large as Congo is $1/44 = 0.023$. This suggests the small chances of achieving the synthetic control's predictive power.

Figure 3 displays the distribution of the gaps estimated between the observed productive efficiency and its counterfactual resulting from the 44 iterative placebo tests. The gray lines show the gap associated with each of the 44 runs of the test. The black line displays the estimated gap for Congo.

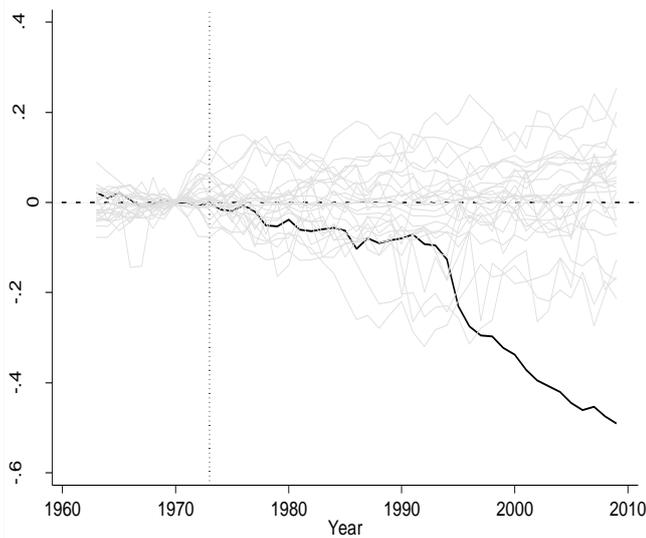


Figure 3: Productive efficiency gaps in Congo and placebo gaps in 44 control countries (discards 18 countries with pre-treatment MSPE five times higher than Congo's)

As Figure 4 indicates, the estimated gap for Congo during 1973-2009 is unusually large relative to the distribution of gaps for the countries in the donor pool. That is, the synthetic control method provides an excellent fit for productive efficiency in Congo prior to the onset of kleptocracy in 1973.

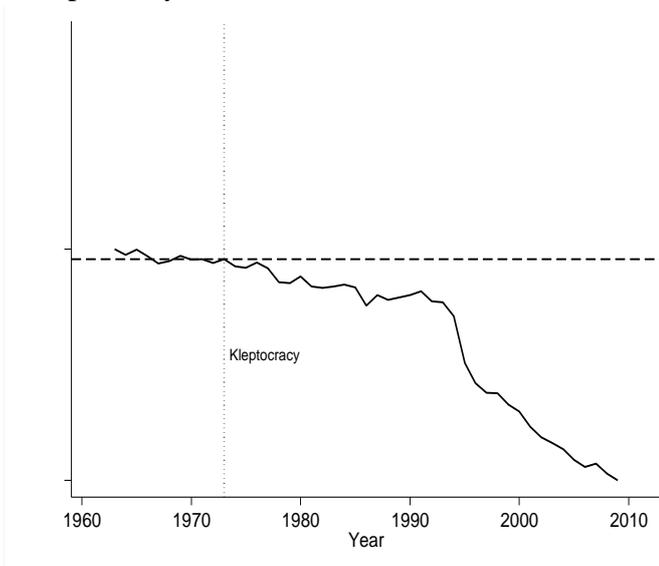


Figure 4: Gap in productive efficiency between Congo and Synthetic Congo

The average of the squared discrepancies between productive efficiency in Congo and its synthetic version during the period 1963-1972 is about 0.000354 and the same squared discrepancies among the 44 countries in the donor pool is about 0.00273. This suggests that the synthetic control method is able to provide a good fit for productive efficiency before the intervention for the majority of the countries in the donor pool. The country with the worst fit in the pre-intervention period is Libya with a MSPE of 0.1101. This is not surprising because Libya has posted high average productive efficiency score for the period under investigation. This procedure suggests that if the Synthetic Congo had failed to fairly approximate the past trajectory of productive efficiency in the years before 1973 I would have interpreted that the post-1973 gap between the real and the synthetic Congo was also artificially created by the lack of fit rather than the effect of predatory policies. In Figure 3, I exclude countries that had a pre-1973 MSPE of more than 20 times and 5 times the MSPE of Congo. Among the 26 countries in Figure 3, the Congo gap line is the most unusual line about the early-1970s. Another way of checking the significance of the results of the Congo gap relative to the gaps obtained from the placebo runs is the ratio of post-1973 to pre-1973 of the MSPE for Congo and that of all 44 countries. The ratio for Congo is about 485.87 times the MSPE for the pre-1973 period and no other control country had achieved such a large ratio. The probability of reaching a post-to-pre 1973 kleptocracy MSPE ratio as large as Congo assuming that the intervention was randomly assigned in the data is about 2.3 percent. This suggests that the synthetic control method well retrieves the missing productive efficiency for Congo after the validation of the results by the placebo tests.



I propose a driven-data method that reproduces the missing productive efficiency due kleptocracy in Congo and apply for the first time the synthetic control method to productivity and efficiency analysis. In such an application in African context the challenge remains on the availability data at the early period of my sample. I calculate the losses due to kleptocracy as the difference between the observed productive efficiency and the estimated counterfactual productive efficiency multiplied by the output. In dollar terms, the loss is calculated as a product between the gap of productive efficiency and the output. That is, by how much Congo should have been able to expand its agricultural productivity in the case of good governance and strongly institutionalized polity. Results suggest that the total loss tapped \$160.34 billion from 1974 to 2009 with a maximum loss of \$ 5.5 billion (43 percent of GDP for 1994, spillover of Rwanda's genocide), an average loss of \$5.5 billion over the sample period (28 percent of GDP), and a minimum loss \$3.02 billion in 1974 (slightly about 15 percent of GDP). The modeling strategy for this event-study incorporates the uncertainty about the validity of the control. The placebo tests support the results. In following Abadie and Gardeazabal (2003), I was able to obtain a weighted combination of synthetic control countries for both case studies that fairly approximate the pre-intervention features of Congo. The study shows that the probability of obtaining such results of the magnitude of those obtained for Congo would be extremely small 2.3 percent. This suggests that the synthetic control method is appropriate for this analysis.

IV. Conclusions and Discussion

The lessons learned from the past may inspire new paths in Congo by fostering formal and informal

institutions and constitutional arrangements, which promote social cooperation, secure private property rights, protect wealth, eliminate confiscatory government, provide growth-enhancing infrastructure, and reduce opportunities for public and private predation. While alternative explanations for Congo's poor economic performance are suggested in the literature, including geography, culture and luck, there is a broad consensus that bad institutions and constitutions that do not tie hands of politicians and foster competition in the political, social, and economic markets, have had an influential effect on the contemporary poor performance of Africa (Glaeser et al., 2004; Hall and Jones, 1999; Acemoglu et al., 2000; Easterly and Levine, 1997; Nunn and Wantchekon, 2011; Boettke et al., 2005; Buchanan, 1990). Congo's growth rebound is not in horizon. It is important to understand why some countries recover in the post-treatment period while others show little prospect of recovery. Institutions matter, predatory or extractive institutions inhibit production and productivity (Acemoglu et al., 2000, 2005; La Porta et al., 1997, 1999; Easterly and Levine, 2012) and fuel distrust (Knack, 2001). In such an environment, the provision of good policies and public goods is in short supply. Many researchers note that quality of institutions or "rules of the game" (North, 1990) or "authoritative rules of the game...which shape the political arena and influence what kinds of policies are enacted" (Kopstein and Lichback, 2005, p.6) makes a substantive difference in terms of economic outcomes and society's prosperity. The widespread use of the monetary and fiscal policies has shown their limits for the case of Congo. The major socioeconomic indicators suggest a somber situation: significant human suffering, food insecurity, and economic hardship. This study provides a foundation for a constitutional



economics research program in Congo—the most critical and missing part of the development economics research agenda in many African countries.

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