Does fiscal policy differ between successful and unsuccessful post-conflict transitions? Lessons from African Civil Wars

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ABSTRACT:

Purpose: *The chapter studies the impact of fiscal policy on the stabilization of peace in the aftermath of a civil war.*

Methodology: *We use data from African war-torn countries and study the issue of post-conflict stabilization from an empirical perspective. We employ probit analysis to formally estimate the effect of fiscal policy on the probability of maintaining peace in the post-conflict period.*

Findings*: The success of post-conflict transition does not require downsizing the government. On the contrary, successful post-conflict transitions are on average characterised by an increase in the size of the government. However, both expenditures and revenues increase at a comparable pace. Moreover, in successful post-conflict transitions, the increase in government size involves an increase in the incidence of capital expenditure relative to government consumption. On the revenue side, budgetary grants appear to strengthen the chances of success. A heavier debt burden does not seem to compromise the probability of successfully completing the post-conflict transition.*

Research limitations/Implications*: Future research should (i) extend the sample to non-African countries, (ii) extend the analysis to other macroeconomic policy variables, and (iii) supplement cross-country analysis on the role of fiscal policy with country case studies. A potential application of the findings of this chapter is the construction of a model to predict the evolution of currently ongoing post-conflict transitions.*

Social implications: *The findings bear implications on how governments should conduct fiscal policy in the aftermath of a conflict. They also provide guidelines for the international community on how best to assist post-conflict economies.*

Originality*: Papers concerned with the determinants of peace in the post-conflict period do not generally look at the potential contribution of fiscal policy. This chapter is the first attempt, to the best of our knowledge, to provide econometric evidence on the role of fiscal policy as a possible driver of peace stabilization in the aftermath of a conflict.*

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Introduction

Conservative estimates suggest that in the five decades following the end of World War II the total death toll generated by civil wars is five times higher than the interstate death toll. More than 70 countries (roughly one third of the total membership of the United Nations system) experienced episodes of large-scale civil violence, most of which produced massive refugee flows and economic devastation (Fearon and Laitin, 2003). Given these figures, it is not surprising that the causes of civil war have become the object of a recent, lively literature at the intersection of economics and political science (see, *inter alia*, Collier and Hoeffler, 1998; Collier et al. 2008a; Miguel et al. 2004; Lujala et al. 2005; Humprehys, 2005). Within this avenue of research, specific attention is now being devoted to the aftermath of a conflict[1]. As empirically shown by Collier and Hoeffler (2004), the risk of a civil conflict decreases with the time elapsed since the last civil conflict. The implication is that the post-conflict period is particularly risky and hence it is important to study the conditions for the consolidation of peace in the aftermath of a conflict.

The available empirical evidence indicates that the maintenance of peace during the post-conflict transition critically hinges upon the interaction of political and economic factors. Among those latter ones, the literature gives prominent relevance to the level and growth of per-capita GDP and the degree of dependence on natural resources (see Collier et al. 2008b). Not much attention has been instead devoted to the role of macroeconomic policies, particularly fiscal policy. The case studies reported in Boyce and O'Donnell (2007) emphasize the importance of public finance in re-building state institutions following a civil conflict. Collier (2009) discusses reforms and strategies that post-conflict economies ought to undertake to increase revenues and to strengthen the effectiveness of spending. However, cross-country evidence on how different dimensions of fiscal policy affect the probability of successfully completing the post-conflict transition is still missing. In other words, from the perspective of a policymaker in a post-conflict country it would be important to be able to answer questions like: Should governments focus more on government consumption or public investment? Should governments worry about the stabilisation of public finance (eventually downsizing government) or expand the public sector? Is the burden of debt going to be a cause of post-conflict failure? What is the contribution of budget grants to peace stabilization? However, the existing research leaves these (and related) questions largely unanswered.

The purpose of this chapter is to fill in the void through an econometric analysis of the links between fiscal policy and post-conflict peace in African countries. The focus on Africa is justified on two grounds. First, about half of all civil wars have taken place in Africa and even today several countries on the continent are torn by civil conflicts and/or go through a difficult post-conflict stabilization. In this sense, one can argue that Africa is a good case study for researchers interested in the dynamic interaction between economics and conflict. Second, an econometric analysis of the type we have in mind requires sufficiently comprehensive fiscal policy data and these are often not available for many post-conflict countries. However, for the specific case of Africa, the Africa Development Database of the World Bank provides a valuable source of information. Combining this database with country sources we collected from national statistical offices, we have been able to construct a panel dataset of fiscal policy variables for all of the post-conflict countries in Africa covering the

[1] See for instance the recent special issue of the *Journal of Peace Research*, 45, 4, 2008.

period 1965-2008. Of course, the dataset has several missing observations, especially at the beginning of the sample. Still, it contains enough data points for us to be able to apply formal regression analysis tools.

The theoretical prior of our analysis draws on the game-theoretic analysis of international relations and military interactions (see for instance O'Neill, 1994). In the aftermath of a conflict, the stability of peace depends on whether or not the fighting parties will stick to the peace agreement. This peace agreement can be represented as the allocation of a peace payoff between the contending parties. The larger the payoff and the more equitable the distribution, the longer peace will be maintained. Our argument is that fiscal policy is one of the key determinants of the size of the peace dividend. At the same time, it is through fiscal policy that the "winner" (the government) can make the allocation of the dividend more or less equitable. The size and scope of government expenditure, the incidence of taxation, and the burden of debt are therefore likely to be important drivers of peace stabilization. To test this hypothesis we will be looking at how fiscal policy variables affect the probability of a country to successfully complete ten years of continued peace after the end of a conflict. We will also study how the dynamics of fiscal policy variables differ between successful and unsuccessful post-conflict stabilizations.

Our main findings can be summarized as follows. The success of post-conflict transition does not require downsizing the government.[2] On the contrary, successful post-conflict transitions are on average characterised by an increase in the size of the government. However, this increase occurs in such a way that the overall stability of public finances is not heavily compromised: both expenditures and revenues increase at a comparable pace. Moreover, in successful post-conflict transitions, the increase in government size involves an increase in the incidence of capital expenditure relative to government consumption (whose contribution to horizontal redistribution is questionable). On the revenue side, budgetary grants appear to strengthen the chances of success. At the same time, and perhaps contrary to common-sense intuition, a larger burden of debt does not seem to compromise the probability of successfully completing the post-conflict transition.

In the rest of the chapter we present first a few simple empirical regularities concerning fiscal variables during the post-conflict transition. We then provide econometric evidence from the estimation of a probit model of post-conflict peace. Subsequently, we discuss the difference in the dynamic of fiscal policy between a successful and an unsuccessful post-conflict episode. Finally, we formulate some conclusions and policy recommendations. The Appendix reports the full chronology of conflicts in Africa and the description of the variables used in the analysis.

Some preliminary empirical regularities

[2] Government downsizing has been for long a common practice in reforming the public sector of developing economies. This view was still implicit in the Washington Consensus of the mid '90s. However, it has since then progressively changed (see USAID, 2005 and UNDESA, 2005 for a discussion of different approaches). Our results suggest that from the perspective of peace stabilization, a reform of the public sector that involves government downsizing might be particularly risky.

For the purpose of this chapter, the post-conflict period is identified with the first ten years that follow the end of a conflict.[3] The chronology of civil wars for the African continent is based on Gleditsch (2004) and updated to 2008 (using the information available up to the end of 2009). The full chronology is reported in the Appendix.

A post-conflict transition can be successful or unsuccessful. Success occurs when the country effectively stays at peace for the whole of the ten years. A failure instead occurs whenever a new war goes off within less than ten years from the end of the previous conflict. In the rest of the chapter, we refer to *SPC* as the successful post-conflict and *UPC* as the unsuccessful post-conflict. In the case of African countries, we count 15 successful post-conflict transitions and 15 unsuccessful post-conflict transitions. There are also nine countries that at the cut-off date of 2008 were still at peace, but had not yet completed the ten years spell. These are regarded as "ongoing" post-conflict transitions. All in all, the unit of observation in the dataset is a post-conflict episode and we include a total of 33 episodes.[4] For each episode, data are reported on an annual basis. Fiscal data fully cover 21 of the 33 episodes (11 *SPC* and 10 *UPC*). Another two episodes (notably Algeria *SPC* 1964-1973 and Burundi *SPC* 1973-1982) are covered only partially. For the remaining 10 episodes, no fiscal data are available (see Appendix for details about the availability of fiscal data by country).

As a way to gauge some simple empirical regularities on the behaviour of fiscal policy variables in post-conflict situations, Table 1 reports some basic summary statistics. For each of 24 fiscal policy indicators (see appendix for a full list of variables), the table reports the average (μ) and the standard deviation (σ) in *UPC* and *SPC*. To better appreciate the differences between successful and unsuccessful post-conflicts, the table also reports the standardised mean difference of each variable. This is equal to the average of the variable in *SPC* minus the average of the variable in *UPC* divided by the standard deviation of the variable in the full sample. Finally, the table also reports average and standard deviation of the fiscal variables in states of war and peace as references to compare the statistics computed for *UPC* and *SPC*. Note that by periods of peace, here we mean the years of peace that follow the end of successful post-conflict transition until the beginning of a new war (or until 2006, in case no new war has began since the conclusion of the last-one).

INSERT TABLE 1 ABOUT HERE

Focusing on the differences between *UPC* and *SPC*, there are indeed a few variables that exhibit a rather large (positive or negative) standardised mean difference. Both the level of debt (*debt*) and the incidence of interest payments on total expenditure (*int_p*) are much higher in *SPC* than in *UPC*. In fact, the standardised mean difference of *debt* is the largest of all variables. The positive sign implies that on average *SPC* is characterised by higher debt

[3] This is a standard approach in the literature. An empirical justification for this choice comes from the observation that the post-conflict risk sharply decreases after ten years from the end of the previous war (see Collier and Hoeffler, 2004 and Collier et al., 2008b). The results of our analysis change somewhat when we define post-conflict as the five (rather than ten) years after the end of a conflict, but the main qualitative implications and recommendations concerning the use of fiscal policy remain the same.

[4] We include the 15 completed *SPC* and the 15 *UPC*, but we exclude the ongoing post-conflicts. We make however an exception for the three ongoing post-conflicts that started in 2001 (Sierra Leone, Algeria, and DRC). As of 2009, these countries are entering the ninth year of consecutive peace and all available information suggest that peace is likely to last for an additional year. We therefore include these three ongoing stabilization episodes as *SPC.* The results of our empirical analysis are not qualitatively different when the three episodes are excluded.

levels (and a larger incidence of interest payments on total expenditure) than *UPC*. This is indeed quite surprising as it suggests that the burden of debt might not be an obstacle to the maintenance of post-conflict peace. *SPC* is also characterised by a significantly larger level of current grants (*grt_c*). Therefore, it seems that providing post-conflict countries with budgetary grants is more conducive to peace than granting debt relief. We will return on this important policy conclusion later on, also addressing the issue of possible reverse causality.

A large mean difference is also observed with respect to defence expenditure (*def*): in *SPC* defence and military expenditure is effectively much lower than in *UPC*. This observation is coherent with previous findings by Collier and Hoeffler (2006). Two issues are worth noting, however. First of all, the sample of observations is quite small. The variable *def* is not available for several of the episodes of unsuccessful post-conflict transition and hence we have to be careful in making generalizations. Second, reverse causality might be particular strong in this case: it is not necessarily a large military expenditure that causes the failure of the post-conflict transition, but rather, it might be that the expectation of a failure (possibly already evident in the first years of post-conflict transition) leads the government to spend more on the military.

SPC is also characterised by larger levels of public education on expenditure (*edu*). Unfortunately nothing can be said about health expenditure as we have no observations on *health* for the countries in *UPC*). Bearing in mind that also for *edu* the number of actual observations in each state is small, the positive association between higher education expenditure and post-conflict success is coherent with the idea that the stabilization of peace requires a larger provision of public goods.

Government size appears to be on average higher in *UPC*, but differences between successful and unsuccessful post-conflicts are relatively small. The only exception is represented by public sector wages (*wages*), which are larger in *SPC*. In fact, as it will be discussed later on, the critical difference between *UPC* and *SPC* with respect to government size is not related to average levels, but rather to dynamics in the first years of the post-conflict transition. With respect to composition of expenditures and revenues, we observe a rather larger incidence of government consumption on total expenditure (*gov_p*) in *UPC*. On the contrary, non tax revenues (*rev_ntx* and *rev_ntx_p*) are generally larger in *SPC* than in *UPC*. Reflecting the small differences in average government size across the two states, indicators of fiscal balance also do not differ much between *UPC* and *SPC*. If anything, *SPC* tends to display better balances than *UPC* when grants are included.

Looking beyond averages: evidence from probit analysis

We now move beyond period averages to estimate the effect of fiscal policy variables on the probability of successfully completing the post-conflict transition. Our statistical framework is the standard binary choice model. Let $Y = 0$ denote the *SPC* state and $Y = 1$ the *UPC* state. Given a set of country characteristics $\mathbf{x}$, we can write the probabilities of being in each state as:

(1) $Prob(Y = 1|\mathbf{x}) = F(\mathbf{x}, \boldsymbol{\beta})$

(2) $Prob(Y = 0|\mathbf{x}) = 1 - F(\mathbf{x}, \boldsymbol{\beta})$

where $\boldsymbol{\beta}$, the parameters to be estimated, represent the impact of changes in **x** on the probability of each state (see Greene, 2008 pages 772-774). The estimation of the β parameters then requires the specification of a functional form for the distribution on the right hand side of equations (2) and (3). Either the normal distribution or the logistic distribution is used in the literature. We experimented with both of them and we noticed that results are basically the same. We report and comment on results obtained using the normal distribution:

(3) $Prob(Y = 1|\mathbf{x}) = \int_{-\infty}^{\mathbf{x}'\boldsymbol{\beta}} \Phi(\mathbf{x}'\boldsymbol{\beta})$

where $\Phi(\bullet)$ denotes the standard normal distribution.

The vector **x** includes, for each country in each period, a set of socioeconomic characteristics plus the fiscal policy variables. More specifically, we control for the quality of country's polity (*polity*), the timing of elections (*elections*), the degree of ethnic fragmentation (*ethnix*), and the level and growth rate of per-capita gdp (*gdp_pc* and *growth* respectively). Level and growth of per-capita GDP and fiscal policy variables are all lagged to reduce the risk of reverse causality.[5]

Table 4 reports the estimated marginal effects of model (2)-(3). The marginal effects are formally defined as $f(\mathbf{x}'\hat{\boldsymbol{\beta}})\hat{\boldsymbol{\beta}}$, where $\hat{\boldsymbol{\beta}}$ are the maximum likelihood estimates of $\boldsymbol{\beta}$. Because of the way in which we have coded the binary dependent variable, a positive sign indicates that higher values of the variable reduce the probability of a successful post-conflict transition.

INSERT TABLE 2 ABOUT HERE

Before discussing the role of fiscal policy variables, it is worth taking a look at the impact of other socioeconomic controls. Elections and a better polity increase the chance of a successful post-conflict transition. This intuitive result is however hardly statistically significant. Ethnic fragmentation also reduces the risk of returning to violence in the post-conflict period. Both findings are consistent with the results reported by Collier et al. (2008). The role of per-capita income is instead ambiguous. The sign of the marginal effect of per-capital GDP changes across different specifications of the **x** vector. However, when it is statistically significant, the marginal effect is positive, thus suggesting that richer economies are at higher risk of failure. This effect is however counter-balanced by the effect associated with the growth of per-capita GDP. The estimated coefficients on *growth* are again hardly significant in statistical terms. However their negative sign indicates that the quicker per-capita GDP returns to its post-conflict level, the more likely it is that the post-conflict transition will end up successfully.

We now turn to the estimated marginal effects associated with the fiscal policy variables. In the attempt to reduce multicollinearity, we employ a smaller group of variables than the original 24. In particular, we build on the evidence of the previous subsection to see whether the largest mean differences documented in Table 3 correspond to statistically significant effects on the probability of success/failure of the post-conflict transition.

In column I of table 2 we look at expenditure variables. A higher level of total expenditures (*exp*) increases the probability of successfully completing the post-conflict transition. We

[5] The alternative approach is to instrument the potentially endogenous variables. We re-ran our model using lagged values of the potentially endogenous regressors as instruments and results are not qualitatively different from those reported in the text. Instrumental variable estimates are available from the authors upon request.

suggest the following interpretation. A larger government implies a larger (and possibly more equitably distributed) peace dividend, thus making it optimal for both contending parties to maintain peace. The proportion of government consumption on total expenditure (*gov_p*) instead has a negative effect on the probability of successful post-conflict transition. Our idea is that for any given size of the government, the value of the peace dividend increases faster the more resources are allocated to productive expenditure. In this sense, a greater incidence of consumption relative to investment is not beneficial to peace stabilization. However, public wages do help promote peace (as indicated by the negative coefficient on *wages_p*) as they make rebellion a less attractive option for a larger number of people.

In column II we consider revenue variables. Total revenues (*rev*) do not play any statistically significant role, even though the negative sign is broadly in line with the idea that a larger government helps maintain post-conflict peace. A larger proportion of non-tax revenues (*rev_ntx_p*) instead reduces the probability of *SPC*. We believe that this effect is related to greed: non-tax revenues might capture the depth of fiscal exploitation of natural resources and hence they represent a rent that parties would like to appropriate with violence at some point in time during the post-conflict phase. Finally, more grants (*grt_p_c*) increase the probability of *SPC*. The effect is statistically large, meaning that grants significantly contribute to increasing the peace-payoff of the contending parties.

We consider the impact of the burden of debt in column III. As expected from the analysis of mean differences, a higher debt to GDP ratio (*debt*) does not seem to be an obstacle to successful post-conflict transition. In fact, in our sample, *SPC* is characterised by a systematically higher level of debt than *UPC*. Higher debt levels are therefore associated with a higher probability of *SPC*. At the same time, the fact that higher debt levels also involve a larger amount of resources to be used for interest payments (*int_debt_p*) does not seem to matter much in terms of probability of success of the post-conflict transition.

Finally, in column IV we look at the impact of the overall stability of the fiscal position. In fact, we tried all six different definitions of fiscal balance, and only *bal_prim_grt* happens to be statistically significant. A better primary balance (inclusive of grants) helps complete the post-conflict transition successfully. Our interpretation is that the enlargement of government size in the post-conflict phase is conducive to peace only if it involves both the expenditure side and the revenue side of the budget. On the contrary, if only expenditures are expanded (especially government consumption) than the chances of success do not necessarily increase.

Dynamic comparisons

We now turn to the analysis of the dynamic evolution of fiscal policy variables during the post-conflict transition. To this purpose we compute averages of fiscal policy variables in each state as follows. Let w_{ijt} be the generic fiscal policy variable *w* observed at time *t* in country *i* in state *j* (where *j = SPC, UPC*). Then, the average taken over all *i*s in state *j* at time *t* is $w_{jt} = \sum_{i=1}^{n} w_{ijt}/n$, where *n* is the total number of countries in state *j* at time *t*. For each period *t*, the average of fiscal policy variables is defined as $w_{j(t)} = \sum_{t=1}^{T} w_{jt}/T$, where $T = 1, 2...$up to 10 (if *j = SPC*) or the start of a new conflict (if *j = UPC*). The sequence of $w_{j(t)}$ values therefore offers a dynamic representation of how the fiscal policy variable evolves over time in each state.

To highlight differences in the dynamic evolution, in Table 3 we report the difference $w_{SPC(t)} - w_{UPC(t)}$ for $t = 1, 2..5$. The entire series $w_{SPC(t)}$ and $w_{UPC(t)}$ are reported in Tables 4 and 5, but we limit our investigation to the first five years of post-conflict transition because, the number of countries in *UPC* is very small after the fifth year. The trends of some of the key fiscal policy variables are also depicted in figure 1.

INSERT TABLES 3, 4, 5 AND FIGURE 1 ABOUT HERE

It appears from the table that *SPC* is initially characterised by lower revenues (*rev*) and lower expenditures (*exp*) than *UPC*. Revenues and expenditures grow during the first five years of transition in both *SPC* and *UPC*. However, while the average growth rate of expenditure is roughly the same in the two states (1.8% per year in *UPC* and 1.7% per year in *SPC*), the growth rate of revenues is significantly faster in *SPC* (2.7% per year versus 0.45% per year on average in *UPC*, see panel A of Figure 1). Therefore, a distinctive feature of successful post-conflict stabilizations is that the expansion of government size is matched by the increase in revenues, so that the overall fiscal position is not significantly destabilised.

At the beginning of the post-conflict transition, *SPC* is also characterised by lower levels of capital expenditure (*exp_k*), current expenditure (*exp_c*), and government consumption (*gov*) than *UPC*. However, the evolution of these components of expenditure in the first few years of transition is quite different across the two states. In the *UPC* state, the expansion in total government expenditure mostly takes the form of an increase in government consumption, while capital expenditure in proportion of GDP declines. On the contrary, in the *SPC* state all of the three components increase, but capital expenditure increases faster than the other two (2.9% per year against an increase of 1.4% a year of current expenditure and 0.3% a year of government consumption). As a result of these trends, the incidence of government consumption in total expenditure (*gov_p*) grows fast in *UPC*, while it declines in *SPC* state (see panel B of Figure 1).

The dynamic pattern of current grants (*grt_c*) is also quite interesting. The difference between *SPC* and *UPC* is quite small at the beginning of the transition. But then, the difference grows quickly during the first four years: while *SPC* is characterised by a steady increase in the flow of grants, *UPC* displays the opposite trend (see panel C of Figure 1). The fact that immediately at the beginning of the post-conflict transition grants are higher in the *SPC* state might suggest that the international community "picks-the-winner": among all post-conflict countries, some are chosen and receive a larger initial endowment of grants, which in turn puts them in the condition to sustain peace over the post-conflict period. However, the fact that over time the gap in the level of grants between the two states widens might indicate some endogeneity in the behaviour of the international community: grants tend to go to those countries that show more promising progress towards peace, while countries that initially struggle in maintaining peace receive less and less support. This sort of "disengagement" of the international community then leads to the failure of the post-conflict transition process.

The data in the table also confirm our previous findings on the role of debt. Not only total debt (*debt*) is initially significantly higher in *SPC* (see panel D of Figure 1), but the difference also grows over time. In *SPC*, the level of debt moderately increases in percent of GDP over the first five years of transition (1.4% per year), while in the *UPC* state it decreases. The proportion of resources devoted to interest payments (*int_p*) is systematically and persistently higher in *SPC* than in *UPC*. These findings might seem at odds with the evidence recently reported by UNDP (2008) on the contribution of debt relief to post-conflict recovery. However, we stress that there are two important differences between our analysis and

UNDP's (2008). First of all, we look at different samples of post-conflict episodes. Second, UNDP is mainly concerned with the correlation between debt service and post-conflict growth, while we look at how, after controlling for growth, debt affects the probability of stabilizing peace. In other words, we look at the role of debt from a sharply different angle than UNDP.

Finally, the analysis of the dynamics of military, education, and health expenditure is once again severely affected by the lack of data. The dynamic comparison must indeed be limited to the very first years of transition. It appears that *SPC* is effectively characterised by lower military expenditure (*def*). This expenditure also declines steadily (more than 8% per year) throughout the first five years of post-conflict transition. The decline seems however to be even faster in the *UPC* state in the first two years of transition. However, we have to stress that much of this decline is driven by the variations in the size of the military in Angola. Most of the other countries in *UPC* increase, albeit only marginally, their military expenditure between the first and the second year of post-conflict transition.

Conclusions

In this chapter we have studied the role of fiscal policy in determining the success or failure of post-conflict transition. Our idea is that fiscal policy is relevant because it can significantly affects the payoffs of the conflicting parties, thus strengthening (or weakening) their commitment to the peace agreement. We have then looked at the issue from an empirical perspective. Using a large collection of fiscal policy variables for the group of war-torn African countries, we have found that the fiscal dimension does matter, even after controlling for other possible determinants of war and peace. With respect to the specific case of the post conflict transition, our key results can be summarised as follows. The success of post-conflict transition does not require downsizing the government. On the contrary, successful post-conflict transitions are on average characterised by an increase in the size of the government. However, this increase occurs in such a way that the overall stability of public finances is not heavily compromised: both expenditures and revenues increase at a comparable pace. Moreover, in successful post-conflict transitions, the increase in government size involves an increase in the incidence of capital expenditure relative to government consumption (whose contribution to horizontal redistribution is questionable). On the revenue side, budgetary grants appear to strengthen the chances of success. At the same time, and contrary to common-sense intuition, a larger burden of debt does not seem to compromise the probability of successfully completing the post-conflict transition.

From our results we can draw a few policy recommendations that we believe are also relevant to non-African post-conflict countries. First of all, countries in post-conflict transition should not pursue fiscal stability through a reduction in the size of government. On the contrary, there is need for a larger government in the first years after a war, so government expenditure should increase. However, this increase should not significantly exceed the rate of expansion of revenues. With the end of the conflict, the potential for tax collection will increase and government ought to strengthen their efforts in this direction. A balanced expansion of revenues and expenditures is likely to be more conducive to the success of the post-conflict transition than government downsizing.

Second, while expanding the overall size of the government, countries should also adjust the scope of the government. In this context, it appears to be important to promote capital

expenditure, which is expected to strengthen the peace dividend over time.[6] The proportion of government consumption in total expenditure should correspondingly decrease and possibly more space should be given to targeted forms of redistribution to address horizontal inequalities between the fighting parties. Unfortunately we have limited data on education and health expenditure, but the little evidence we presented seems to suggest that the reallocation of resources from the military to the provision of public education and health will strengthen peace through two complementary effects: (i) a larger peace dividend and (ii) dynamically efficient redistribution.

Third, financial assistance in the form of budgetary grants might be more important than debt relief in the first years of post-conflict transition, at least from the perspective of maintaining peace. Because the debt burden does not appear to affect the chances of success, while grants do, the international community should consider a new approach in assisting post-conflict economies: in the immediate after-math of a war, debt cancellation ought to be replaced by direct budgetary assistance to compensate the weak capacity of governments to mobilize domestic resources. Of course, in the medium term, debt cancellation will remain important to improve the development prospects of the country.

[6] We stress the complementary between this recommendation and Boulding's (1946) advice to rebuild assets as peace stabilization tool in the aftermath of World War II.

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Appendix

Variables definition

Name	code	Definition
		Fiscal variables in percent of GDP
		(source: African Development Indicators, World Bank, and National Statistical Offices)
Total expenditure	Exp	Total expenditure and net lending includes both current and capital (development) expenditures and includes lending minus repayments.
Total revenues	Rev	Total revenue and grants equals the sum of government revenue and grants. Revenue includes all nonrepayable and nonrepaying government receipts other than grants. Grants are defined as unrequited, nonrepayable, noncompulsory receipts.
Government consumption	Gov	Current expenditure on goods and services comprises payments of wages and salaries in cash to employees (including the armed forces) before deduction of withholding taxes and employees' contributions to social security and pension funds, as well as employers' contributions to superannuation schemes outside government, and other purchases of goods and services (wages and salaries in kind, office supplies and maintenance charges etc.).
Wages and Salaries	Wages	Wages and salaries consist of all payments in cash, but not in kind, to central government employees in return for services rendered, before deduction of withholding taxes and employees contributions to social security and pension funds.
Current expenditure	exp_c	Total current expenditure includes requited payments other than for capital assets or for goods or services to be used in the production of capital assets, and unrequited payments for purposes other than permitting the recipients to acquire capital assets.
Capital expenditure	exp_k	Expenditure for acquisition of land, intangible assets, government stocks, and nonmilitary and nonfinancial assets; also for capital grants and lending minus repayments.
Defence expenditure	Def	Data generally cover expenditures of the ministry of defense (excluded are expenditures on public order and safety, which are classified separately).
Health expenditure	Health	Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds.
Education expenditure	Edu	Total public expenditure is current and capital public expenditure on education plus subsidies to private education at the primary, secondary, and tertiary levels by local, regional and national government including municipalities (household contributions

		excluded).
Non tax revenues	rev_ntx	Receipts from sources other than the tax system, like property income, fees, fines, and contributions to government employee pension funds within government.
External capital grants	grt_k	Grants are unrequited, nonrepayable, noncompulsory receipts of government from other governments or international institutions. In determination of the deficit/surplus, grants are grouped with revenue and expenditure rather than with financing.
Total current grants	grt_c	Grants include grants from other foreign governments, international organizations, and other government units.
Total government debt	Debt	Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans. It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government (end year).
Overall budget balance including current grants	bal_ov_grt	Defined as Total revenue including current grants minus total expenditure and net lending (author's definition)
Overall budget balance excluding current grants	bal_ov	Defined as the overall budget balance including current grants minus total current grants (author's definition)
Current budget balance including current grants	bal_c_grt	Defined as total current revenues including grants minus total current expenditure (author's definition)
Current budget balance excluding current grants	bal_c	Defined as the current budget balance including current grants minus total current grants (author's definition)
Primary budget balance including current grants	bal_prim_grt	Defined as total revenue including grants minus current expenditure net of interest on debt (both domestic and external) (author's definition)
Primary budget balance excluding current grants	bal_prim	Defined as the primary budget balance including grants minus total current grants (author's definition)

Fiscal variables in proportion of revenues and/or expenditures

(source: African Development Indicators, World Bank,

and National Statistical Offices)

Current expenditure	exp_c_p	Current expenditure in proportion of total expenditures
Government consumption	gov_p	Government consumption in proportion of total expenditure
Wages and salaries	wages_p	Wages and salaries in proportion of current expenditure
Interest on debt	int_p	Interest accrued on outstanding domestic and external debt in proportion of current expenditure
Non tax revenues	rev_ntx_p	Non tax revenues in proportion of total revenues
	Other variables	
Per_capita gdp	Gdp_pc	GDP per capita is gross domestic product divided by midyear population. Data are expressed in constant US dollars and log-transformed. Source: World Development Indicators (World Bank)
Growth	Growth	Annual percent change of per-capita GDP. Source: World Development Indicators (World Bank)
Ethnic fractionalization	Ethnix	Probability that two randomly selected individuals are not of the same ethnic group. Source La Porta et al. (1999).
Quality of the polity	Polity	Quality of the polity defined in terms of democracy and autocracy. The variable takes values between -10 (absolute autocracy) and +10 (perfect democracy). Source: Polity IV database.
Time of elections	Legelec	Dummy variable taking value 1 in years when a legislative election was held. Source: Database of Political Institutions (Beck et al. 2001)

Chronology of civil wars in African countries and availability of fiscal data

	War	Successful post-conflict episodes (SPC)	Unsuccessful post-conflict episodes (SPC)	Ongoing post-conflict episodes (OPC)	Fiscal data available since
Chad	1966-1971 1980-1988 1990	1991-2000	1972-1979 1989		1983
Nigeria	1967-1970 1980-1981 1984	1985-1994	1971-1979 1982-1983		1985
Rwanda	(1963-1964) 1990-1994 1998	1965-1974 1999-2006	1995-1997		1980
Mozambique	1979-1992	1993-2002			1980
Liberia	1989-1990 1992-1996 2000-2003		1991 1997-1999	2004-	2001
Guinea-Bissau	1998	1999-2008			1984
Sierra Leone	1991-1996 1998-2000		1997	2001-	1980
South Africa	1989-1993 1999-2002		1994-1998	2003-	1973
Sudan	1965-972 1983-1992 1995-2006	1973-1982	1993-1994	2006-	1984
Zimbabwe	1972-1979	1980-1989			1980
Algeria	(1962-1963) 1992-2000	1964-1973		2001-	1967
Angola	1975-1994 1998-2001		1995-1997	2002-	1985
Burundi	1972 1988 1991-1998 2000-2001	1973-1982	1989-1990 1999	2002-	1980
Cameroon	(1959-1961)	1962-1971			1980
Democratic Rep. of Congo	1965 1993 1996-2000	1966-1975	1994-1995	2001-	1996
Congo	1997-1999	2000-2009			1984
Uganda	1966 1980-1988 1996-2001	1967-1976	1989-1995	2002-	1984
Ethiopia	1974-1991	1992-2001			1981

Sources: Gleditsch (2004) and CIA World Factbook (2009 issue). Fiscal data are taken from the African Development Database of the World Bank.

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Table 1: Summary statistics of fiscal variables

	UPC		SPC		Standardised	War periods		Peace periods	
	μ	σ	μ	σ	mean diff.	μ	σ	μ	σ
Government size									
Rev	0.221	0.921	0.209	0.403	-0.130	0.178	0.554	0.229	0.420
Exp	0.270	0.594	0.254	0.339	-0.115	0.254	0.523	0.314	0.356
Gov	0.116	0.707	0.097	0.392	-0.308	0.124	0.618	0.118	0.411
Wages	0.054	0.678	0.056	0.488	0.037	0.060	0.792	0.069	0.540
Government scope									
exp_c	0.163	0.735	0.164	0.415	0.009	0.188	0.617	0.194	0.418
exp_k	0.095	0.711	0.088	0.457	-0.098	0.068	0.685	0.112	0.831
exp_c_p	0.674	0.270	0.644	0.203	-0.168	0.745	0.203	0.656	0.301
gov_p	0.477	0.249	0.398	0.325	0.581	0.525	0.233	0.392	0.328
wages_p	0.290	0.364	0.392	0.730	-0.567	0.319	0.393	0.358	0.339
Def	0.056	1.416	0.026	0.888	-0.911	0.044	0.814	0.011	1.145
health	..	..	0.020	0.514	..	0.017	0.588	0.021	0.373
Edu	0.024	0.565	0.032	0.378	0.475	0.041	0.329	0.038	0.498
Sources of revenues									
grt_k	0.014	2.063	0.009	7.099	0.3538	0.014	2.621	0.008	5.342
grt_c	0.006	3.351	0.017	1.737	0.322	0.006	2.429	0.006	4.694
rev_ntx	0.027	1.134	0.043	0.977	0.442	0.028	1.149	0.042	1.383
rev_ntx_p	0.154	1.060	0.214	0.835	-0.105	0.186	0.886	0.186	1.149
Debt									
debt	0.559	0.926	1.313	0.581	1.003	0.997	0.687	0.678	1.055
int_p	0.161	0.573	0.206	0.788	0.346	0.140	0.701	0.195	0.672
Fiscal balance									
bal_ov_grt	-0.049	-4.353	-0.043	-1.922	0.057	-0.072	-1.068	-0.082	-1.225
bal_ov	-0.062	-3.473	-0.072	-1.319	0.442	-0.081	-0.983	-0.091	-1.284
bal_c_grt	0.031	6.556	0.038	2.018	0.079	-0.015	-4.767	0.031	2.927
bal_c	0.018	11.287	0.012	7.429	-0.090	-0.023	-3.101	0.021	4.384
bal_prim_grt	0.034	2.714	0.065	1.076	0.262	0.018	3.669	0.060	1.165
bal_prim	0.016	5.728	0.035	2.282	-0.066	0.008	8.096	0.046	1.617

Note: difference means that the variable is on average higher i SPC than in UPC. See appendix for variables definition and text for explanations on how variations within states (σ) and across states (s) are computed.

Table 2: Probit analysis of successful and unsuccessful post-conflict transitions

	I		II		III		IV	
polity	-0.002		-0.010		-0.011		-0.014	***
elections	-0.044		-0.044		-0.068		-0.008	
ethnix	-0.044	**	-0.137		-0.073		-0.101	**
gdp_pc	0.079	**	0.062		-0.087		-0.021	
growth	-0.038		-0.050		-0.426	*	-0.117	
exp	-0.010	**	..		..		..	
gov_p	0.004	*	..		..		..	
wages_p	-0.008	**	..		..		..	
rev	..		-0.002		..		..	
rev_ntx_p	..		0.005	*	..		..	
grt_p_c	..		-0.949	**	..		..	
debt	..		..		-0.003	***	..	
int_p	..		..		0.083		..	
bal_prim_grt	..		..		..		-0.010	**
N. Obs	94		96		74		89	
Wald chi	20.800	***	16.7	**	26.3	***	19.92	***
Pseudo R2	0.2213		0.105		0.328		0.319	

Notes: the table reports marginal effects estimated from model (2)-(3), see text. The base outcome is SPC (= 0). All fiscal variables, gdp_pc and growth are all lagged by one period to control for possible endogeneity effects. See appendix for variables definition. *, **, *** denote statistical significance at usual confidence levels.

Table 3: Differences between successful and unsuccessful post-conflict transition year-by-year.

	Years of post-conflict transition				
	1	2	3	4	5
Government size					
exp	-0.050	-0.051	-0.063	-0.060	-0.042
rev	-0.019	-0.004	-0.015	-0.007	0.006
gov	-0.015	-0.037	-0.048	-0.051	-0.042
wages	-0.005	-0.005	-0.009	-0.010	-0.009
Government scope					
exp_c	-0.012	-0.032	-0.039	-0.044	-0.030
exp_k	-0.045	-0.020	-0.007	-0.002	-0.005
exp_c_p	0.044	-0.002	0.005	-0.015	-0.020
gov_p	-0.036	-0.074	-0.081	-0.093	-0.085
wages_p	0.136	0.142	0.125	0.131	0.112
def	-0.072	-0.025	..	..	..
health	..	..	..	..	..
edu	0.077	..	..	..	..
Sources of revenues					
grt_k	-0.004	0.001	0.004	0.002	-0.009
rev_ntx	0.002	0.007	0.008	0.010	0.016
grt_c	0.004	0.008	0.008	0.010	0.012
rev_ntx_p	0.046	0.040	0.042	0.061	0.085
Debt					
debt	0.437	0.674	0.870	0.905	0.911
int_p	0.049	0.060	0.087	0.062	0.071
Fiscal balance					
bal_ov_grt	-0.072	-0.002	0.017	0.031	0.032
bal_ov	-0.078	-0.014	0.005	0.015	0.013
bal_c_grt	-0.094	-0.009	-0.002	0.016	0.024
bal_c	-0.097	-0.018	-0.011	0.003	0.007
bal_prim_grt	-0.027	0.028	0.021	0.037	0.042
bal_prim	-0.028	0.024	0.015	0.026	0.025

Notes: the table reports the difference between the level of fiscal variables in SPC and UPC in the first five years of post-conflict transition (see text for details). The statistics in the table are computed as the simple difference between the corresponding SPC and UPC values of tables A3 and A4 of the Appendix. A positive value indicates that the variable is higher in SPC than in UPC.

Table 4. Average of fiscal variables in Successful post-conflicts, year-by-year

	1	2	3	4	5	6	7	8	9	10
grt_k	0.016	0.015	0.016	0.015	0.006	0.007	0.007	0.008	0.009	0.010
rev_ntx	0.033	0.040	0.039	0.039	0.041	0.043	0.044	0.046	0.044	0.042
grt_c	0.014	0.018	0.018	0.018	0.018	0.019	0.019	0.019	0.018	0.017
rev	0.167	0.181	0.186	0.188	0.193	0.202	0.208	0.211	0.210	0.209
rev_ntx_p	0.216	0.229	0.221	0.219	0.222	0.227	0.226	0.225	0.217	0.208
exp_c	0.140	0.151	0.155	0.154	0.157	0.159	0.162	0.165	0.166	0.165
gov	0.086	0.088	0.089	0.088	0.089	0.090	0.092	0.095	0.098	0.099
exp_k	0.062	0.070	0.073	0.072	0.075	0.078	0.081	0.085	0.088	0.090
wages	0.046	0.048	0.049	0.049	0.051	0.052	0.053	0.055	0.056	0.056
exp	0.208	0.224	0.231	0.228	0.234	0.240	0.245	0.252	0.256	0.257
exp_c_p	0.714	0.696	0.684	0.679	0.674	0.666	0.661	0.653	0.645	0.639
gov_p	0.431	0.410	0.402	0.397	0.395	0.391	0.392	0.394	0.398	0.400
int_p	0.240	0.237	0.254	0.257	0.251	0.243	0.226	0.208	0.194	0.193
wages_p	0.446	0.429	0.421	0.416	0.404	0.393	0.390	0.392	0.395	0.395
debt	1.281	1.347	1.471	1.481	1.466	1.420	1.382	1.339	1.298	1.260
def	0.029	0.035	0.031	0.029	0.026	0.024	0.023	0.025	0.026	0.026
health	1.543	1.526	1.559	1.606	1.679	1.863	..	..	..	..
edu	3.495	3.533	3.651	3.434	3.237	3.063	2.961	3.040	3.018	3.105
bal_ov_grt	-0.037	-0.039	-0.040	-0.035	-0.035	-0.032	-0.032	-0.038	-0.044	-0.047
bal_ov	-0.059	-0.067	-0.070	-0.064	-0.065	-0.064	-0.063	-0.069	-0.073	-0.074
bal_c_grt	0.024	0.028	0.028	0.030	0.033	0.039	0.042	0.040	0.037	0.037
bal_c	0.004	0.002	0.002	0.004	0.006	0.011	0.013	0.011	0.010	0.011
bal_prim_grt	0.045	0.053	0.057	0.059	0.061	0.070	0.072	0.068	0.063	0.062
bal_prim	0.023	0.025	0.028	0.031	0.031	0.038	0.040	0.036	0.033	0.033

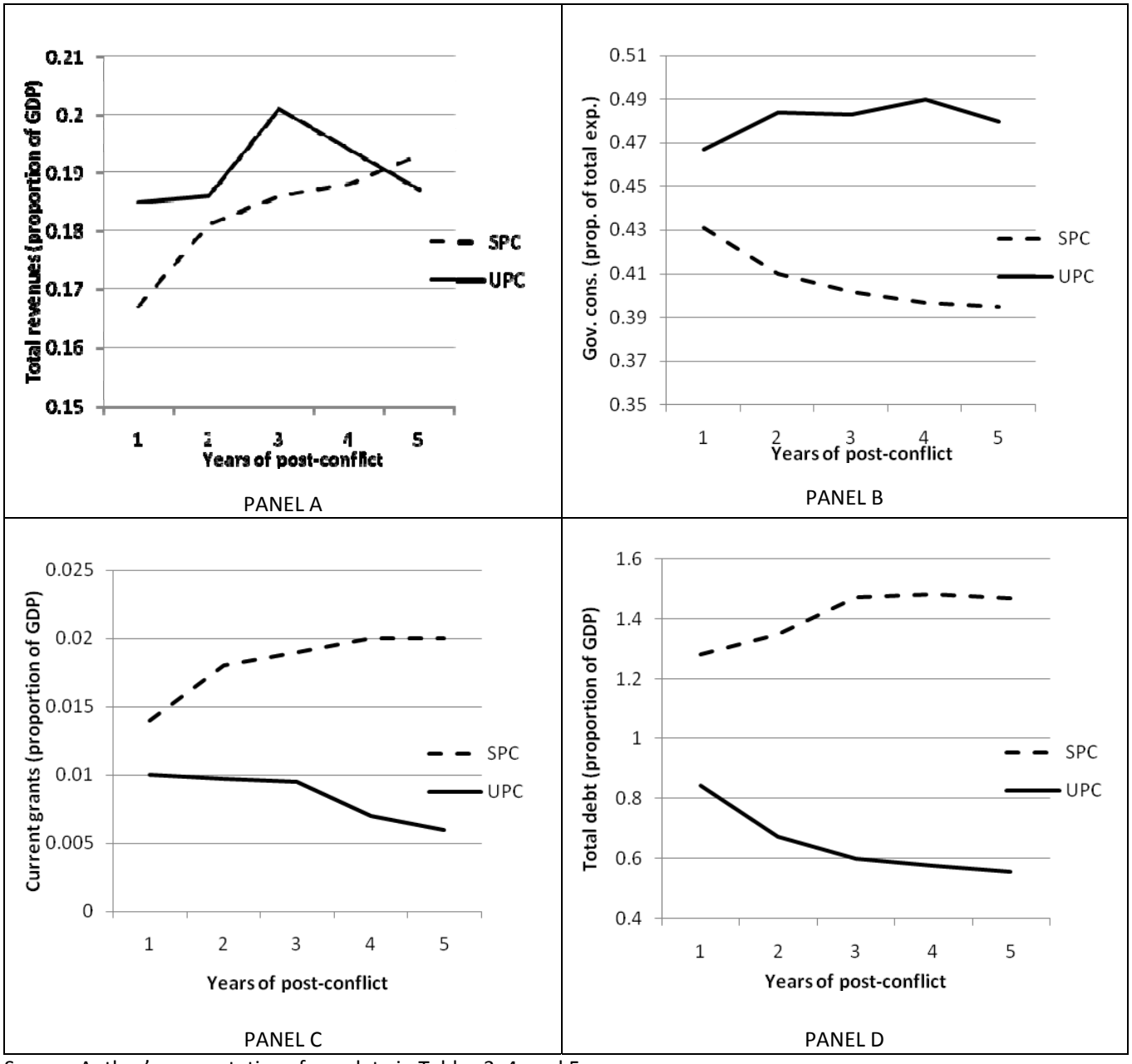
Notes: average of fiscal policy variables at years 1, 2..., 10 of successful post-conflict transitions. All averages are computed over the total of 13 successful post-conflict episodes for which fiscal data are available.

Table 5. Average of fiscal variables in unsuccessful post-conflicts, year-by-year.

	1	2	3	4	5	6	7	8	9
grt_k	0.020	0.014	0.012	0.013	0.015	0.016	0.016	0.014	0.012
rev_ntx	0.031	0.033	0.032	0.029	0.024	0.021	0.019	..	..
grt_c	0.010	0.010	0.010	0.007	0.006	0.005	0.004	0.004	0.003
rev	0.185	0.186	0.201	0.194	0.187	0.170	0.159	..	..
rev_ntx_p	0.169	0.189	0.179	0.159	0.137	0.126	0.119	..	..
exp_c	0.153	0.183	0.194	0.198	0.187	0.169	0.157	0.146	0.138
gov	0.101	0.125	0.137	0.139	0.131	0.121	0.115	0.107	0.102
exp_k	0.107	0.090	0.079	0.074	0.080	0.090	0.096	0.098	0.102
wages	0.051	0.053	0.058	0.059	0.060	0.053	0.049	..	..
exp	0.258	0.275	0.294	0.288	0.276	0.261	0.247	..	..
exp_c_p	0.670	0.698	0.679	0.694	0.693	0.658	0.642	..	..
gov_p	0.467	0.484	0.483	0.490	0.480	0.467	0.470	..	..
int_p	0.190	0.178	0.167	0.195	0.181	0.170	0.159	0.162	0.161
wages_p	0.311	0.286	0.296	0.286	0.292	0.279	0.279	..	..
debt	0.844	0.673	0.601	0.576	0.556	0.536	0.513	0.481	0.456
def	0.101	0.060	0.053	..	..	..	..	..	..
health	..	..	..	..	..	..	..	..	..
edu	0.034	..	..	..	..	..	..	..	..
bal_ov_grt	0.035	-0.036	-0.057	-0.067	-0.067	-0.073	-0.073	..	..
bal_ov	0.018	-0.053	-0.074	-0.079	-0.077	-0.082	-0.080	..	..
bal_c_grt	0.118	0.037	0.030	0.014	0.009	0.007	0.006	..	..
bal_c	0.101	0.020	0.013	0.001	-0.001	-0.002	-0.001	..	..
bal_prim_grt	0.073	0.025	0.036	0.022	0.019	0.018	0.017	..	..
bal_prim	0.051	0.001	0.012	0.005	0.005	0.006	0.007	..	..
N. Of episodes	10	8	5	4	4	3	3	2	1

Notes: average of fiscal policy variables at years 1, 2..., 9 of unsuccessful post-conflict transitions. The bottom line of the table reports the number of episodes over which averages are computed.

Figure 1: dynamics of selected fiscal policy variables in SPC and UPC



Source: Author's computations from data in Tables 3, 4, and 5.