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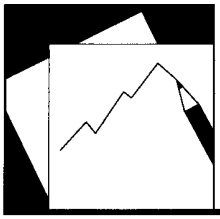

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The Dynamic Effect of Social and Political Instability on Output: The Role of Reforms

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The Dynamic Effect of Social and Political Instability on Output: The Role of Reforms

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Abstract

The aim of this paper is to analyze the dynamic effect of social and political instability on output. Using a panel of up to 183 countries from 1980 to 2010, the results of the paper suggest that social conflicts have a significant and negative impact on output in the short-term with the magnitude of the effect being a function of the intensity of political instability. The results also show that the recovery of output over the medium-term depends on the ability of the country to implement, in the aftermath of a social instability episode, reforms aimed at improving the level of governance. The results are robust to different checks and estimation strategies.

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1. Introduction

For a long time, economists and social scientists have produced a large body of literature attempting to uncover the effects of political instability on a country's economic performance, especially with regards to output and growth. Recently, the sequence of political and social events dubbed "the Arab spring" has raised new concerns amongst scholars and institutions about the effects of the resulting political unrest on the growth outlook of the directly involved countries and, more broadly, of the Middle-Eastern and Northern-African (MENA) regions. Ongoing protests and demonstrations across the region have already resulted in (often violent) regime changes in countries such as Tunisia, Egypt, Libya and Yemen, and their detrimental effects on output growth and broader economic activity are readily visible. But, for how long will said effects last?

Rather than occasional and rarely occurring, political instability is a widely spread and recurrent phenomenon around the World. Figure 1 below illustrates this by displaying the average number of major cabinet changes (a milder form of political instability) across different geo-political regions in recent times (1980 through 2006). As can be observed, the value for this indicator is rarely equal to zero and is actually high in some instances (e.g. Central and Eastern Europe in 1989). This certainly points at said variable as a good proxy for overall social and political instability, and motivates us to extensively use it in this study.

At a theoretical level, political instability and economic growth are interrelated at various levels. In fact, this relationship has not been established as unidirectional since it is possible that both are jointly determined. In one direction, we have that, for instance, the uncertainty associated with political instability has a direct impact on economic growth via deterred investment in physical capital, loss of human capital due to e.g. migration, volatility of fiscal and monetary policies leading to high inflation, etc. In the opposite direction, unsatisfactory economic performance and high degrees of inequality may lead in turn to social and political unrest derived from a country's people's grim expectations about future (and current) economic opportunities.

Empirically, several studies have attempted to shed light on the degree to which political instability and economic growth interact with each other. In general, it has been found that political instability indeed: *i*) leads to lower economic growth (Alesina et al., 1996; Jong-A-Pin, 2009; Aisen and Veiga, 2013); *ii*) reduces investment made by the private sector (Rodrik, 1991; Barro, 1991; Alesina and Perotti, 1996); *iii*) increases inflation levels and volatility (Cukierman et al., 1992; Aisen and Veiga, 2008); amongst other adverse effects on the economy.

There is a gap, however, in the literature with regards to the dynamic effects of political instability on economic growth, and this paper attempts to fill that gap. In particular, we study the effects of instability on growth over the medium term (rather than just the contemporaneous or short-term effects), paying particular attention to their dynamics.

Amongst our main results, we find that the adverse effects of instability on output start to vanish after only 2-3 years (depending on the specific measure of instability we consider), leaving the medium-term effects as practically null *on average*. We find, however, differentiated effects across countries, depending on their ability to implement reforms that improve governance: countries that reform within 2-3 years following a conflict episode show a higher output growth rate in the medium term, while the opposite occurs to countries that do not implement reforms.

The rest of the paper is organized as follows: in Section 2 we discuss the data, its sources, and some descriptive statistics. We present our empirical analysis in Section 3, discussing both the short- and medium-term effects of political instability on output growth, as well as the role of political reforms. Finally, Section 4 concludes and presents some implications for policy.

2. Data and descriptive statistics

This paper considers a panel of annual data for up to 183 countries spanning from 1980 to 2010. Data for social conflicts and political instability indicators are obtained from several sources. First amongst our sources is the Cross-National Time-Series Data Archive (CNTS), made available by Databanks International (Banks, 2011), which contains a vast array of political, economic, social, and demographic variables for nearly every country in the World dating back as far as 1815 in many cases. In particular, the CNTS dataset provides information on the occurrence of: (*a*) cabinet changes; (*b*) government crises; (*c*) assassinations; (*d*) general strikes; (*e*) guerrilla warfare; (*f*) purges; (*g*) riots; (*h*) revolutions; and (*i*) anti-government demonstrations.

The second source is the Political Instability Task Force (PITF) dataset, which covers several variables aimed at assessing and explaining political instability and potential state failures around the World. Overall, ten different indicators of social instability are considered in the analysis:[4] (*i*) cabinet changes (*CC*); (*ii*) government crises (*GC*); (*iii*)-(*v*) three different indicators of regime instability obtained using principal component analysis of different groups of indicators; (*vi*) general strikes (GS); (*vii*) antigovernment demonstrations (DE); (*viii*) a composite measure of social instability obtained using principal component analysis of indicators (*b*)-(*i*) described above; (*ix*) a composite measure of social instability (*WI*) computed as a weighted average of the CNTS indicators (*b*)-(*i*); and (*x*) an indicator of adverse regime change.

With regards to the other variables (macroeconomic, demographic, governance, and market regulations) used in the empirical analysis, the sources of the data are the IMF's World Economic Outlook (WEO), the World Bank's World Development Indicators (WDI),

[4] See Annex for details.

the Penn World Table (PWT version 7.0) by Heston et al. (2011), the World Governance Indicators (WGI) described in Kaufmann et al. (2010), and the Fraser Institute's Economic Freedom of the World (EFW) report of 2010. The full list of variables, definitions and sources is provided in the Annex.

Table 1 presents descriptive statistics for the social conflict indicators, as well as for the macroeconomic and demographic variables used in the paper. For the cabinet changes (CC) indicator we have a total of 4,549 observations, ranging from a minimum of 0 to a maximum of 5. For the other social conflict indicators we also have a high number of observations, ranging from 4,448 (for the Regime Instability Index 3, RI3) to as many as 5,856 (for the Adverse Regime Change indicator, AD). As for real GDP per capita (our dependent variable), we have up to 5,081 observations, with values going from a minimum of $117.6 to a maximum of $159,144.50.[5]

The evolution over time of the average number of major cabinet changes (CC) across regions is depicted in Figure 1. It is interesting to note that, for the whole sample, cabinet changes across regions display a high degree of co-movement, with pair-wise correlations being all positive[6] and as high as 0.52 (excluding correlations of individual regions with the whole World, which tend to be high by construction). If we restrict the sample to exclude the 1980s, we observe that co-movements between individual regions are even stronger, with pair-wise correlations being as high as, for instance, 0.70 between cabinet changes in Sub-Saharan Africa and Central and Eastern European countries.

Figure 2, likewise, depicts the co-movement over time between the different social instability indicators considered in this paper for the full sample of countries. Also in this case we can observe a tendency in these indicators to co-move with each other. For the full period under consideration, we observe that pair-wise correlations are all positive and as high as, for instance, 0.96 between Cabinet Changes and the Regime Instability Index 1,[7] or 0.56 between Cabinet Changes and Government Crises. If we consider the subsample starting in 1990, we observe that such behavior in the indicators remains qualitatively unchanged, and in some cases the correlations are even stronger. This surely hints towards the importance of considering multiple, alternative measures of social and political instability, while at the same time maintaining robustness in our results.

[5] Real GDP per capita is expressed in constant PPP international dollars of 2005. The maximum in our sample corresponds to Qatar in 2009.

[6] Except for that between the Commonwealth of Independent States and the Advanced Economies, which is -0.03.

[7] This high correlation is not surprising, though, given that CC is used in the construction of RI1.

One of the most widely used indicators of political instability is the number of major cabinet changes (CC), and the existing literature has tried to measure and assess its effects on economic growth (Alesina et al., 1996; Aisen and Veiga, 2013). The empirical evidence of previous studies in the literature has in general pointed out to a negative association between social instability and contemporaneous growth. This negative relation is confirmed by Figure 3. However, if we extend the analysis over the medium-term (7 years after the occurrence of a social instability episode), it seems that social instability and changes in real GDP are not correlated (Figure 4). It is important, therefore, to distinguish between short and medium-term effects of political instability and social conflict on economic growth. This will be the focus of the next section.

3. Empirical Analysis

This section analyzes the impact of social instability on output. The first part of the section assesses the effect of social instability on contemporaneous growth. The second part of the section extends the analysis to the medium term, analyzing the dynamic response of output to social instability up to 8 years following its occurrence. The third part assesses the role of reforms, in the aftermath of an episode of social instability, in shaping the effect of social and political instability on output.

3.1 Short-term

Following previous studies in the literature on the short-term effects of social and political instability on output, the methodological approach used in the paper consists of regressing contemporaneous output growth against an indicator of instability which takes discrete values according to the number of episodes of social instability occurred and 0 otherwise, and a set of variables influencing short-term growth. In particular, the formal specification of the empirical model used for the short-term analysis is as follows:

$$y_{i,t} - y_{i,t-1} = \alpha_i + \beta S_{it} + \boldsymbol{\delta}' \boldsymbol{X_{it}} + \varepsilon_{i,t} \quad (1)$$

where, for each country *i* at time *t*, $y_{i,t}$ is the log of real GDP, S_{it} is a measure of social and political instability, α_i are country-specific effects included to account for different growth trends among countries and to control for time invariant variables which may affect growth in the short-term (Durlauf et al., 2005), $\boldsymbol{X_{it}}$ is a set of variables influencing growth in the short-term, and the coefficient β represents the effect of social and political instability on growth. The empirical literature on growth has suggested numerous variables as possible determinants of growth (see, for example, Levine and Renelt, 1992; Sala-i-Martin 1997, Sala-i-Martin *et al*. 2004). However, some of these variables are likely to influence growth only over the medium–term, and are not available on a yearly basis (e.g., human capital) over a long time span and for a large set of countries. Therefore, in order to keep the specification parsimonious, the variables included in the vector $\boldsymbol{X}$ have been restricted to: investment prices, trade openness (defined as the share of total exports and imports in GDP), population

growth, and (the log of) initial GDP. In addition, given that the main concern is to introduce relevant control variables into the regression, so that the estimated impact of social instability on output is not biased due to the omission of variables, two lags of real GDP growth and a time trend have been included in the specification.

Table 2 shows the estimation results. To control for the fact that the error term in equation (1) may be serially auto-correlated within countries, the variance and covariance matrix has been estimated using the clustered sandwich estimator. Column 1 shows a benchmark growth regression in which political instability is measured by the number of *cabinet changes* (Alesina et al., 1996; Aisen and Veiga, 2013). The coefficient associated with cabinet changes is negative and statistically significant at 1%, and suggests that an additional cabinet change is associated with a reduction in real GDP growth of about 1 percentage point. Among the control variables, we find that the initial level of GDP, the lagged output growth and time trend are the ones that are statistically significant in most of the specifications. The results are robust across different sets of controls and to the exclusion and inclusion of country and time fixed effects.

To check for the robustness of the results, we re-estimated equation (1) also excluding each region at a time. The results displayed in Table 3 show, also in this case, that an additional cabinet change is associated with a reduction in real GDP growth of about 1 percentage point. Interestingly, our point estimate is smaller (in absolute value) when MENA or Sub-Saharan (SSA) countries are excluded from the sample, which indirectly suggests that the effect may be even more detrimental for these regions.

Given that social instability is a multi-dimensional phenomenon which eventually goes beyond the number of cabinet changes, we also consider in the analysis the remaining nine indicators of political instability (described above). In sum, the ten indicators of political instability under consideration are:[8] (*i*) cabinet changes (*CC*); (*ii*) government crises (*GC*); (*iii*)-(*v*) three different indicators of regime instability obtained using principal component analysis of different groups of indicators (*RI1*-*RI3*); (*vi*) general strikes (GS); (*vii*) antigovernment demonstrations (DE); (*viii*) a composite measure of social instability obtained using principal component analysis of the CNTS indictors (*b*)-(*i*); (*ix*) a composite measure of social instability (*WI*) computed as a weighted average of the CNTS indicators (*b*)-(*i*); and (*x*) an indicator of adverse regime change.

The results in Table 4 show that the negative and significant effect of social instability on contemporaneous growth is robust across all different indicators. Interestingly, however, the results also suggest an intuitive ranking of the indicators in terms of their effect on growth: on the one hand, strikes and antigovernment demonstration have the lowest effect (0.3-0.6 percentage points) while, on the other hand, adverse regime changes display the

[8] See Annex for details.

largest effect (7 percentage points). The control variables that have a statistically significant effect remain being the time trend, the initial level of GDP and the first lag of real GDP growth.

One problem in estimating equation (1) with OLS is that the presence of a lagged dependent variable and country fixed effects may in principle bias the estimation of β in small samples (Nickel, 1981), although the large number of time periods in our analysis mitigates this concern[9]. In addition, social instability may be endogenous to output growth leading to inconsistency of the OLS estimates. To address these concerns, equation (1) has been re-estimated using the two-step system-GMM estimator, where the indicator of social instability has been treated as endogenous[10]. The results, presented in Table 5, confirm that social instability has a significant impact on contemporaneous growth. Also in this case, while strikes and antigovernment demonstration have the lowest effect (0-0.2 percentage points), adverse regime changes have the largest effect (7 percentage points).[11]

Overall, the results confirm previous evidence in the literature suggesting that social instability has detrimental effects on growth in the short term, with the magnitude of the effect being function of the intensity of political instability.

3.2 Medium-term

In order to estimate the medium-term dynamic impact of social instability episodes on output, the paper follows the method proposed by Jorda (2005) and Teuling and Zubanov (2010) which consists of estimating impulse response functions (IRFs) directly from local projections.[12] In detail, for each future period *k* the following equation has been estimated on annual data:

$$y_{i,t+k} - y_{i,t} = \alpha_i^k + Time_{it}^k + \boldsymbol{\delta}'^{\boldsymbol{X_{it}}} + \sum_{j=1}^{l} \gamma_j^k \Delta y_{i,t-j} + \beta_k S_{it} + \varepsilon_{i,t}^k, \quad (2)$$

where α_i^k are country fixed effects, $Time_{it}$ are country-specific time trends, $\boldsymbol{X_{it}}$ is the set of controls described in the previous section, and β_k measures the impact of social instability on the change of (the log of) real output for each future period $k = 1,\ldots,8$. Since fixed effects are

[9] The finite sample bias is in the order of 1/T, where T in our sample is 31.

[10] The two-step system-GMM estimates (with Windmeijer standard errors) are computed using the xtabond2 Stata command developed by Roodman (2009). Social instability and all control variables are considered as endogenous (instrumented using up to 2 lags). The time trend is considered as predetermined. The significance of the results is robust to different choices of instruments and predetermined variables.

[11] Consistency of the two-step GMM estimates has been checked by using the Hansen and the Arellano-Bond tests. The Hansen J-test of over-identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process, cannot reject the null hypothesis that the full set of orthogonality conditions are valid. The Arellano–Bond test for autocorrelation cannot reject the null hypothesis of no second-order serial correlation in the first-differenced error terms.

[12] See, for example, Furceri and Zdzienicka (2010, 2012a, 2012b) for recent applications of this approach.

included in the regression the dynamic impact of social instability on output should be interpreted as changes in output compared to a baseline country-specific output trend.

The number of lags (*l*) has been chosen to be equal to two, even when the results are extremely robust to different number of lags included in the specification. Corrections for heteroskedasticity, when appropriate, have been applied using White robust standard errors. Impulse response functions are then obtained by plotting the estimated β_k for k= 0,1,…,8, with 95% confidence bands being computed using the standard deviations associated with the estimated coefficients β_k.

The results from estimating the medium-term impact of social instability (proxied for by cabinet changes) on output using equation (2) are presented in Figure 5. The figure suggests that the statistical significance of the effect of social instability on output vanishes after only 2 years. The effect over the medium term is considerably smaller than the contemporaneous effect and not statistically significant.

To check the robustness of our results, equation (2) has been re-estimated by alternatively including a common time trend, time fixed effects, and country-specific time trends (Panels B-D, Figure 6). The results using these different specifications remain statistically significant and broadly unchanged.

Additionally, we have also re-estimated equation (2) excluding each region at a time. The results show, also in this case, that the effect of social instability on growth is not statistically significant over the medium term (Panels B-H, Figure 7). In particular, in most of the sub-samples the effect becomes insignificant after only 2 years of the occurrence of the social instability episode. An exception is for the results obtained with the sub-sample excluding Sub-Saharan countries. In this case, the effect is statistically significant up to 3 years after the occurrence of such an episode.

As a further robustness check, we have tested the sensitivity of our results to different parameterizations of the lag structure in equation (2). While from a technical point of view the number of lags (*l*) does not have direct effects on the computation of the IRFs, which is based only on the coefficients β_k, different lag structures can indirectly affect the IRFs only to the extent that additional lags are correlated with the explanatory variables. To address this issue we have repeated the analysis for different lags. The results -not presented here- show that while the medium-term effect across different specifications ranges from -1.1 percentage points (two lags) to -0.1 percentage points (six lags), the point estimates are not statistically different from each other. Similar results are also found for the effect computed at different time horizons (*k*), and different social instability indicators.

Finally, the medium-term results are extremely robust when the *k* equations are jointly estimated. In particular, while the estimated coefficients are identical to those reported

in the baseline, the t-statistics obtained with the joint estimation procedure, although moderately smaller, remain statistically insignificant.

As shown by Teulings and Zubanov (2010), a possible bias from estimating equation (2) using country-fixed effects is that the error term of the equation may have a non-zero expected value, due to the interaction of the fixed effects and the country-specific arrival rates of social instability episodes. This would lead to a bias of the estimates that is a function of k[13]. In order to address this issue and to check for the robustness of our results, equation (2) has been re-estimated by excluding country fixed effects from the analysis. However, the results (reported in Panel E of Figure 6) suggest that this bias is negligible, as the difference in the point estimate is small and not statistically significant, and confirm the empirical evidence that the medium-term effect of social instability on output is not statistically different from zero.

In addition, in order to control for possible "dynamic panel bias" due to the presence of country fixed effects and the lagged dependent variables, equation (2) has been re-estimated also using the two-step system-GMM estimator. Also in this case, the results suggest that the statistical significance of the effect of social instability on output vanishes over time (Panel F, Figure 6).

Finally, in order to control for different dimensions and indicators of social instability, equation (2) has been re-estimated for all of the indicators analyzed in the previous section. Figure 8 shows the response associated with the indicators that produce the largest difference in the IRFs. The results, also for the indicators not shown in Figure 8, confirm that the medium-term effect of social instability on output is not statistically different from zero.

3.3 The Effect of Reforms

The results presented in the previous section have shown that, *on average*, social instability does not have a significant medium-term effect on output. However, it is possible that the response of output to social instability over the medium term depends on the ability of a country to implement reforms in the aftermath of an episode of instability. Indeed, it is reasonable to expect that the social instability episode is the result of discontent of the population with the current regime, and that the change in regime has as main objective to improve institutional governance that boosts inclusive growth.

[13] Assuming that social instability has a negative effect on output, the bias would be negative.

In order to test the hypothesis that governance reforms affect the dynamic response of output to social instability, the following empirical model is estimated:

$$y_{i,t+k} - y_{i,t} = \alpha_i^k + Time_{it}^k + \boldsymbol{\delta' X_{it}} + \sum_{j=1}^{l} \gamma_j^k \Delta y_{i,t-j} + \beta_k S_{it} + \vartheta R_{it} S_{it} + \varepsilon_{i,t}^k \quad (3)$$

where R_{it} is an indicator of reforms in governance constructed as the change in a composite measure of governance in the two (or three) years following the social instability episode.

The composite governance indicator is obtained applying the principal component analysis to the six governance indicators described in Kaufmann et al. (2010): *i*) Voice and Accountability, *ii*) Political Stability, *iii*) Government Effectiveness, *iv*) Regulatory Quality, *v*) Rule of Law, and *vi*) Control of Corruption.

The reason to focus on the two- (or three-) year change instead of the one-year change is due to the fact that reforms are identified using only *a posteriori* information. Indeed, reforms tend to be implemented and reflected in changes in the indicators only with some lag from when they are decided. In addition, the use of a longer lag length may allow this procedure to capture gradual reforms that are protracted over time.

The response of output to social instability conditioning for the implementation of reforms in institutional governance is displayed in Figure 9. The figure presents the average response and the responses obtained considering the first and third quartile of the distribution of the two- (or three-) year change in the composite governance indicator. In order to highlight the statistical significance of the results, the lines corresponding to the first and third quartile in the figures are marked with "Δ" when the interaction term and the overall impact are statistically significant at least at a 10 percent confidence level. Looking at the figure, it clearly emerges that the medium-term response of output to social instability is a function of the countries' ability to implement governance reforms in the aftermath of a social instability episode. In particular, while output remarkably increases compared to the pre-crisis level in countries where governance reforms are implemented in the two (or three) years following the instability episode, it significantly contracts in countries where institutional governance has deteriorated. The results are robust to all the different specifications and checks presented in the previous section.

In order to control for different dimensions and indicators of social instability, equation (3) has been re-estimated for all indicators analyzed in the previous section. While the results for the great majority of indicators are very similar to those obtained for cabinet changes, for adverse regime changes the effect of reform on shaping the response of output to social instability is significantly magnified, particularly for those reforms occurred within three years of the occurrence of the adverse regime change (Figure 10, panel B).

Estimates of the impact of governance reform could be biased because of endogeneity of the reforms. In particular, while potential reverse causality is addressed by estimating

changes in GDP in the years that *follow* a social conflict and the adoption of governance reforms, it could still be the case that unobserved factors influencing the dynamics of GDP over time could affect the probability of a reform. To address this endogeneity issue, we have instrumented change in the governance indicator with a set of political variables which can be considered as strictly exogenous. In detail, the set of instruments consists of: (*i*) parliamentary system (presidential vs. parliamentary); (*ii*) the number of veto players who drop from the government in any given year; (*iii*) the initial level of the governance indicator; and (*iv*) lagged changes in the governance indicators.[14] From a theoretical point of view, while the initial level of the governance indicator is likely to be correlated with changes in output, political variables (political system and the number of veto players) can be considered strictly exogenous. In addition, the test of joint significance suggests that these political variables can be considered as strongly exogenous.[15] The results obtained by instrumenting the two- and three-year change in the governance indicators confirm that, over the medium-term (five years after the occurrence of the social instability episode[16]), the effect of social conflict on output is positively related with the change in the governance indicator (Figure 11).

As a robustness check, we have repeated the analysis controlling for other types of reforms. Indeed, since several types of economic reforms are often implemented simultaneously, it is important to distinguish the effect of governance reforms from others. For this purpose, we have considered two other types of reform: (*i*) a product market reform, and (*ii*) a labor market reform. These are key in boosting productivity and raising potential growth (Bouis and Duval, 2011). Therefore, it is reasonable to expect that the response of output to social instability over the medium-term may depend on the ability of a country to implement reforms in those sectors. While the results obtained with these additional reforms still confirm that the medium-term response of output to social instability is a function of change in governance, they also show that reforms in product and labor market regulation have a significant impact over the medium-term, even though their effect is considerably lower than reforms directly improving a country's governance (Appendix).

[14] Other political variables which feature prominently in the empirical literature—such as election cycles, political ideology, government fractionalization, measures of political stability, and the presence of a constitutional limit on the number of years the executive can serve before new elections—have been tested but proved to be statistically insignificant.

[15] The Chi-square test of the null hypothesis of joint significance is 13.23, which is higher than the critical value (10) suggested by Staiger and Stock (1997) for strong instruments. The Hansen J-statistics and the Kleibergen-Paap Wald type F-statistics also validate the exogeneity of the instruments.

[16] Given limited data on political variables we were not able to extend the analysis for 6 and 7 years ahead.

3.3.1 Governance and probability of political instability

The previous section has shown that reforms aimed at improving the level of governance significantly affect the recovery of output over the medium-term. A natural question is then whether countries characterized by better quality of governance are also more resilient to episodes of political and social instability.

To test for this hypothesis, we have estimated a Probit model where the probability of social and political instability episodes is regressed against the initial level of governance and a set of control variables which feature prominently in the social and political science literature. In particular, the set of control variables include: (*i*) a measure of political *polarization*; (*ii*) a measure of government *fractionalization*; (*iii*) the *share of seats of the opposition parties*; (*iv*) a measure of *degree of centralization* (e.g. going from a presidential system to one in which the president is elected by the assembly; (*v*) a measure of *margin of the majority* (defined by the fraction of seats held by the government); (*vi*) an indicator of *autocracy*; and to assess non-linearity in the type of autocratic regime (*vii*) a dummy which takes value equal 1 for regimes at the center of the autocracy distribution (*partial autocracy*).

Table 6 presents the results obtained by regressing the probability of cabinet changes and adverse regime changes on the variables discussed above, and displays the marginal coefficient estimates computed at the sample mean. Starting with cabinet changes, it can be noted that countries with initial better quality of governance have, on average, a lower probability to enter an instability episode. In particular, an improvement of one standard deviation of the governance indicator (equal to 2.2) decreases the probability of a cabinet change by about 3 percent (column III). Since the unconditional probability of the occurrence of a cabinet change is about 37 percent, the results imply a 9 percent increase in the probability of cabinet changes. Among the control variables, we find that the probability of cabinet changes increases with the level of political fractionalization and decreases with the margin of majority and the level of autocracy. Across different specifications the number of cabinet changes correctly specified ranges from 67 to 75 percent.

The results for adverse regime changes also show that the initial level of governance plays a significant role. In particular, an improvement of one standard deviation of the governance indicator (equal to 2.2) decreases the probability of a cabinet change by about 0.6 percent (column VI). Since the unconditional probability of the occurrence of an adverse regime change is about 2 percent, the results imply a 30 percent increase in the probability of an adverse regime change. Interestingly, this result suggests that the effect of governance is considerably larger for adverse regime changes than for cabinet changes. These results, taken together with those of the previous section, suggest that the quality of governance plays a key role in reducing the probability of the occurrence of instability episodes, particularly adverse regime changes, and their medium-term effects on output.

Among the control variables, we find that the probability of adverse regime changes decreases with the level of autocracy, but this relation is non-linear as countries at the center of the autocracy distribution are characterized by a larger probability. Similar results have been found by Bates et al. (2010), which show that partial autocracy is significantly correlated with a higher probability of adverse regime changes. Across different specifications the number of adverse regime changes correctly specified ranges from 81 to 83 percent.

3.3.2 Governance, induced political instability and growth

As shown in the previous section, the probability of instability episodes, particularly adverse regime changes, is significantly and negatively related with the initial level of governance. A natural extension of the analysis of the effect of adverse regime changes on growth is then to test the role of the part of instability that is induced by the level of governance. Thus, in order to evaluate the importance of the initial level of governance, we first construct a fitted value of the probability of adverse regime changes based on the Probit regression with the initial level of governance, and then we regress this fitted value -the part of probability of adverse regime changes induced by the level of governance- on output growth. The results, reported in Table 7, show that social instability induced by the level of governance has a strong negative effect on growth, and the magnitude of the effect is significantly larger than those of the baseline (columns II and III). This result is robust across different specifications of equation (1), and to the inclusion of autocracy and partial autocracy in the first stage regression.

Additionally, we also test whether the induced effect of adverse regimes change is robust to the inclusion of the initial level of governance as a control in the second stage regression. The results in column III of Table 7 show that while the initial level of governance has a direct effect on growth that is not channeled through the probability of adverse regime changes, the effect of the part of the probability of adverse regime changes induced by the level of governance is still negative and statistically significant.

Finally, by decomposing the effect of adverse regime changes in the induced and non-induce part, the results confirm that the induced effect of adverse regime changes is considerably larger than the non-induced component (column IV).

4. Conclusions and Policy Implications

Using a novel and comprehensive cross-country panel dataset, this paper contributes to the empirical literature on the effects of social conflict and political instability on economic growth in various ways. First of all, our results confirm the negative short-term effect of political instability on contemporaneous output growth documented by several previous studies in the literature. Secondly, with methods and results new to the literature, this paper shows that said detrimental effects of instability on growth are not likely to persist if we

extend the time horizon of analysis over the medium-term, as they vanish after only 2-3 years following an episode of conflict.

Thirdly, we present evidence indicating that the medium-term effect of political instability and social conflict on output growth is differentiated across countries, depending on their ability to implement reforms that improve governance within the first 2-3 years in the aftermath of an episode of conflict. More specifically, countries that improve their levels of governance after periods of conflict experience, over the medium-term, output growth that is significantly higher than in those countries that do not improve their governance. Interestingly, the same conclusions can be drawn, although to a lesser extent, regarding structural reforms aimed at improving the product and labor markets. To be sure, this finding is strong evidence in favor of the importance of the adequate policy reaction following an episode of political instability.

Lastly, we also present evidence that the probability of instability episodes, particularly adverse regime changes, is significantly and negatively related with the initial level of governance.

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Annex-Data Description

The dependent and control variables included in the analysis belong to one of several categories, namely:

1) Output

- GDP per capita (*rgdpl* in the WEO dataset, *y* in this paper): Purchasing power parity (PPP) converted GDP per capita (with the Laspeyres methodology), derived from growth rates of private consumption, government expenditures, and investment at 2005 constant prices.

2) Social conflict indicators

- Major cabinet changes (*polit11* in the CNTS dataset; *CC* in this paper): The number of times in a year that a new premier is named and/or 50% of the cabinet posts are assumed by new ministers.

- Changes in Effective Executive (*polit12* in the CNTS dataset): The number of times in a year that effective control of executive power changes hands. Such a change requires that the new executive be independent of his predecessor.

- Coups d'État (*polit03* in the CNTS dataset): The number of extra constitutional or forced changes in the top government elite and/or its effective control of the nation's power structure in a given year. The term "coup" includes, but is not exhausted by, the term "successful revolution". Unsuccessful coups are not counted.

- Major Constitutional Changes (*polit04* in the CNTS dataset): The number of basic alterations in a state's constitutional structure, the extreme case being the adoption of a new constitution that significantly alters the prerogatives of the various branches of government. Examples of the latter might be the substitution of presidential for parliamentary government or the replacement of monarchical by republican rule. Constitutional amendments which do not have significant impact on the political system are not counted.

- Legislative Election (*polit15* in the CNTS dataset): The number of elections held for the lower house of a national legislature in a given year. A limited number of by-elections are included, but most are not.

- Party fractionalization index (*polit01* in the CNTS dataset): This index is based on a formula proposed by Douglas Rae (1968), and is constructed as follows:

$$F = 1 - \sum_{i=1}^{m} \left(t_i\right)^2,$$

where t_i is the proportion of members associated with the *i*th party in the lower house of the legislature (where there are no parties, a zero is entered).

In calculating the Index entries, independents are disregarded and legislative changes between elections are not taken into account. It should also be noted that sources vary on the distribution of seats (and even the overall number of seats) for many countries; thus figures calculated by different researchers may vary.

- Assassinations (*domestic1* in the CNTS dataset). Any politically motivated murder or attempted murder of a high government official or politician.

- General Strikes (*domestic2* in the CNTS dataset). Any strike of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies or authority.

- Guerrilla Warfare (*domestic3* in the CNTS dataset). Any armed activity, sabotage, or bombings carried on by independent bands of citizens or irregular forces and aimed at the overthrow of the present regime.

- Major government crises (*domestic4* in the CNTS dataset; *GC* in this paper): Any rapidly developing situation that threatens to bring the downfall of the present regime, excluding situations of revolt aimed at such overthrow.

- Purges (*domestic5* in the CNTS dataset). Any systematic elimination by jailing or execution of political opposition within the ranks of the regime or the opposition.

- Riots (*domestic6* in the CNTS dataset). Any violent demonstration or clash of more than 100 citizens involving the use of physical force.

- Revolutions (*domestic7* in the CNTS dataset). Any illegal or forced change in the top government elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government.

- Anti-government Demonstrations (*domestic8* in the CNTS dataset). Any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature.

- Weighted index of political instability (*domestic9* in the CNTS dataset; WI in this paper): This is a weighted conflict measure, with the specific weights for different conflicts being the following: Assassinations (25), Strikes (20), Guerrilla Warfare (100), Government Crises (20), Purges (20), Riots (25), Revolutions (150), and Anti-Government Demonstrations (10).

- Adverse regime change (*AD* in this paper): Indicator (dummy = 1) variable for an adverse regime change episode in the PITF dataset.

The following composite indicators are the result of a principal component analysis (PCA) of several groups of individual indicators. For each composite measure, we choose the first component based on Cattell's scree plot test:

- Principal component indicator of political instability (labeled *PC* in this paper): Includes the indicators *domestic1* through *domestic8* from the CNTS dataset.

- Composite measure of political instability (*JAP* in this paper): Includes the measures of political instability obtained by Jong-A-Pin (2009), when the ICRG data are not used.

Furthermore, the following measures (obtained also by PCA) correspond to the groups of indicators suggested by Aisen and Veiga (2013):

- Regime instability index 1 (labeled RI1 in this paper): This measure includes the indicators Cabinet Changes (*polit11*) and Executive Changes (*polit12*) from the CNTS dataset.

- Regime instability index 2 (labeled RI2 in this paper): This measure includes the indicators Cabinet Changes (*polit11*), Constitutional Changes (*polit04*), Coups (*polit03*), Executive Changes (*polit12*) and Government Crises (*domestic4*) from the CNTS dataset.

- Regime instability index 3 (labeled RI3 in this paper): This measure includes the indicators Cabinet Changes (*polit11*) and Executive Changes (*polit12*) … Cabinet Changes (*polit11*), Constitutional Changes (*polit04*), Coups (*polit03*), Executive Changes (*polit12*), Government Crises (*domestic4*), Number of Legislative Elections (*polit15*), and Fragmentation Index (*polit01*) from the CNTS dataset.

- Violence index (labeled VI in this paper): This measure includes the indicators Assassinations (*domestic1*), Coups (*polit03*), and Revolutions (*domestic7*) from the CNTS dataset.

3) <u>Macroeconomic and demographic controls</u>

- Price of investment (*PI*, from PWT): Price level of investment (in logs).

- Openness (*Open*, from PWT): (log) Openness at 2005 constant prices, in percent.

- Population growth (*Popg*, series SPPOPGROW from WDI): Population growth (annual percent rate).

4) Governance and regulation indicators

- Governance (*WGI*, from Kaufmann et al. 2010): Composite measure of the six governance indicators described in Kaufmann et al. (2010): Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. These indicators are aggregated by means of PCA, from which we choose the first component (with the highest associated eigenvalue).

5) Political indicators

- System (DPI, from Beck et al. 2001): parliamentary (value equal to 2); assembly-elected president (1); president (0).

- Polarization (DPI, from Keefer and Stasavage 2003): maximum difference between the chief executive's party's value and the values of the three largest opposition parties.

- Government fractionalization (DPI, from Beck et al. 2001): probability that two deputies picked at random from among the government parties will be of different parties.

- Margin majority (DPI, from Beck et al. 2001): fraction of seats held by the government.

- Opposition's share (DPI, from Beck et al. 2001): total vote share of opposition parties.

- Autocracy (Polity IV Project): level of government autocracy.

The following indicators are composite measures for the quality of regulations on product and labor markets, provided by the Fraser Institute's Economic Freedom of the World (EFW) report 2010. The index ranges between 0 and 10, with higher scores being assigned to economies with better (more flexible) regulations:

- Business/product markets (*area5c*, from EFW): Composite index for the quality of business and product market regulations, based on the following sub-components: Price controls, Administrative requirements, Bureaucracy costs, Cost of starting a business, Extra payments / bribes, Licensing restrictions, and Cost of tax compliance.

- Labor markets (*area5b*, from EFW): Composite index for the quality of labor market regulations, based on the following sub-components: Hiring regulations and minimum wage, Hiring and firing regulations, Centralized collective bargaining, Hours regulations, Mandated cost of worker dismissal, and Conscription.

Table 1. Summary Statistics

	Obs.	Mean	Std. Dev.	Min	Max
Output and Macroeconomic/Demographic Controls					
Real GDP	5,081	9,780.3	12,431.7	117.6	159,144.5
Price of investment	5,081	4.0	0.7	-24.1	6.7
Openness	5,081	4.2	0.6	2.0	6.1
Population growth	5,445	1.7	1.6	-44.4	12.8
Social Conflict Indicators					
Cabinet changes (CC)	4,549	0.5	0.6	0.0	5.0
Government crises (GC)	5,276	0.1	0.4	0.0	5.0
Weighted index of political instability (WI)	5,271	768.2	1,571.5	0.0	2,1250
Principal component indicator of political instability (PC)	5,271	0.0	1.5	-0.8	18.2
Regime instability index 1 (RI1)	4,549	0.0	1.2	-0.8	10.6
Regime instability index 2 (RI2)	4,522	0.0	1.4	-0.9	14.6
Regime instability index 3 (RI3)	4,448	0.0	1.5	-1.1	14.1
General strikes (GS)	5276	0.1	0.5	0	7
Antigovernment demonstrations (DE)	5275	0.5	1.5	0	26
Adverse regime change (AD)	5,856	0.0	0.1	0.0	1.0

Sources: PWT, WDI, WEO, CNTS, PITF and Jong-A-Pin (2009).

Table 2. The contemporaneous effect of social conflicts on output-OLS

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
S_t	-0.011 (-3.87)***	-0.011 (-3.75)***	-0.012 (-3.95)***	-0.012 (-3.95)***	-0.011 (-3.91)***	-0.013 (-4.48)***	-0.011 (-3.87)***	-0.012 (-3.93)***	-0.011 (-3.83)***	-0.011 (-3.64)***
y_{t-1}	-0.077 (-4.35)***	-0.078 (-4.33)***	-0.007 (-0.46)	-0.005 (-0.32)***	-0.071 (-3.71)***	-0.074 (-4.55)***	-0.077 (-4.50)***	-0.075 (-3.98)***	-0.077 (-4.46)***	-0.057 (-4.15)***
Δy_{t-1}	0.094 (1.89)*	0.081 (1.62)*	0.133 (2.55)***	0.123 (2.32)*	-	0.107 (2.09)**	0.094 (1.88)*	0.094 (1.88)*	0.097 (1.97)**	0.099 (2.02)*
Δy_{t-2}	0.022 (0.61)	0.022 (0.60)	0.043 (1.26)	0.046 (1.29)	0.026 (0.65)	-	0.022 (0.61)	0.021 (0.60)	0.022 (0.62)	0.023 (0.61)
IP_t	-0.001 (-0.14)	-0.006 (-0.65)	-0.001 (-0.46)	-0.002 (-0.98)	-0.002 (-0.18)	0.002 (0.29)	-	-0.001 (-0.15)	-0.001 (-0.11)	-0.008 (-1.18)
$Open_t$	0.013 (1.16)	0.012 (1.01)	0.004 (1.36)	0.004 (1.21)	0.004 (1.12)	0.012 (1.04)	0.013 (1.15)	-	0.013 (1.13)	0.032 (3.40)***
$Popg_t$	0.000 (0.12)	0.000 (0.08)	-0.004 (-1.58)	-0.004 (-1.58)	0.001 (0.25)	0.000 (0.08)	0.000 (0.11)	0.000 (0.06)	-	-0.000 (-0.00)
$Time_t$	0.002 (4.52)***	0.003 (4.99)***	0.001 (5.38)***	0.002 (4.52)***	0.002 (4.60)***	0.002 (5.11)***	0.002 (5.20)***	0.002 (6.54)***	0.002 (4.60)***	-
Country FE	Yes	yes	no	no	yes	yes	yes	yes	yes	yes
Time FE	No	yes	no	yes	no	no	no	no	no	no
N	3904	3904	3904	3904	3904	4079	3904	3904	3904	3904
R^2	0.16	0.18	0.06	0.07	0.15	0.16	0.16	0.16	0.16	0.14

Note: t-statistics based on clustered robust standard errors in parenthesis in parenthesis. ***,**,* denote significance at 1%, 5%, and 10%, respectively.

Table 3. The contemporaneous effect of social conflicts on output-OLS

	Full Sample	Excluding AE	Excluding CEE	Excluding CIS	Excluding DA	Excluding LAC	Excluding MENA	Excluding SSA
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
S_t	-0.011	-0.013	-0.011	-0.011	-0.013	-0.013	-0.009	-0.009
	(-3.87)***	(-3.83)***	(-3.68)***	(-3.62)***	(-3.70)***	(-3.81)***	(-3.96)***	(-2.69)***
y_{t-1}	-0.077	-0.075	-0.073	-0.077	-0.079	-0.077	-0.067	-0.100
	(-4.35)***	(-4.06)***	(-4.22)***	(-4.27)***	(-3.62)***	(-4.15)***	(-4.06)***	(-6.91)***
Δy_{t-1}	0.094	0.086	0.080	0.081	0.094	0.083	0.159	0.070
	(1.89)*	(1.71)*	(1.59)*	(1.58)	(1.72)*	(1.52)	(3.88)***	(1.05)
Δy_{t-2}	0.022	0.019	0.015	0.014	0.036	0.026	0.039	-0.018
	(0.61)	(0.50)	(0.40)	(0.36)	(0.90)	(0.75)	(1.30)	(0.60)
IP_t	-0.001	-0.002	-0.004	-0.004	-0.002	-0.002	-0.005	0.012
	(-0.14)	(-0.17)	(-0.40)	(-0.38	(-0.14)	(-0.20)	(-0.45)	(1.30)
$Open_t$	0.013	0.013	0.010	0.014	0.016	0.019	0.014	0.008
	(1.16)	(1.09)	(0.82)	(1.14)	(1.01)	(1.39)	(1.18)	(1.10)
$Popg_t$	0.000	0.001	0.001	0.000	0.001	0.001	0.007	-0.004
	(0.12)	(0.12)	(0.05)	(0.08)	(0.13)	(0.21)	(1.45)	(-1.74)*
$Time_t$	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003
	(4.52)***	(4.87)***	(4.51)***	(4.35)***	(3.78)***	(4.09)***	(3.84)***	(5.97)***
N	3904	3200	3695	3742	3324	3136	3467	2860
R^2	0.16	0.16	0.15	0.15	0.15	0.16	0.20	0.18

Note: t-statistics based on clustered robust standard errors in parenthesis in parenthesis. ***,**,* denote significance at 1%, 5%, and 10%, respectively. AE=Advanced Economies; CEE=Central and Eastern European Countries; CIS=Commonwealth of Independent States; DA=Developing Asia; MENA= Middle East and North Africa; SSA=Sub-Saharan Africa.

Table 4. The contemporaneous effect of social conflicts on output-OLS

	Political Instability					Demonstrations		Political instability & Demonstrations		Adverse Regime
	CC	GC	RI1	RI2	RI3	GS	DE	PC	WI	AD
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
S_t	-0.011	-0.021	-0.006	-0.008	-0.006	-0.006	-0.003	-0.005	-0.005	-0.070
	(-3.87)***	(-3.39)***	(-4.19)***	(-4.46)***	(-4.19)***	(-2.45)**	(-3.37)***	(-3.92)***	(-3.53)***	(-3.37)***
y_{t-1}	-0.077	-0.072	-0.077	-0.077	-0.074	-0.072	-0.073	-0.073	-0.073	-0.078
	(-4.35)***	(-4.37)***	(-4.33)***	(-4.29)***	(-4.23)***	(-4.39)***	(-4.38)***	(-4.29)***	(-4.28)***	(-4.38)***
Δy_{t-1}	0.094	0.104	0.093	0.091	0.096	0.106	0.106	0.105	0.105	0.102
	(1.89)*	(2.23)**	(1.87)*	(1.82)*	(2.31)**	(2.26)*	(2.26)**	(2.27)**	(2.26)**	(2.10)**
Δy_{t-2}	0.022	0.029	0.022	0.023	0.020	0.032	0.033	0.030	0.031	0.022
	(0.61)	(0.95)	(0.61)	(0.65)	(0.52)	(1.02)	(1.05)	(0.99)	(1.01)	(0.87)
IP_t	-0.001	-0.001	-0.000	-0.000	-0.000	-0.001	-0.003	-0.001	-0.000	-0.000
	(-0.14)	(-0.28)	(-0.08)	(-0.06)	(-0.08)	(-0.06)	(-0.10)	(-0.18)	(-0.11)	(-0.02)
$Open_t$	0.013	0.014	0.014	0.013	0.014	0.014	0.014	0.013	0.013	0.017
	(1.16)	(1.39)	(1.18)	(1.15)	(1.19)	(1.40)	(1.43)	(1.24)	(1.25)	(1.72)*
$Popg_t$	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	-0.000
	(0.12)	(0.05)	(0.13)	(0.03)	(0.05)	(0.15)	(0.13)	(0.10)	(0.09)	(-0.03)
$Time_t$	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(4.52)***	(4.11)***	(4.51)***	(4.38)***	(4.17)***	(4.06)***	(4.06)***	(3.91)***	(3.95)***	(4.04)***
N	3904	4461	3904	3898	3848	4461	4460	4456	4456	4507
R^2	0.16	0.15	0.16	0.17	0.17	0.15	0.15	0.15	0.15	0.16

Note: t-statistics based on clustered robust standard errors in parenthesis. ***,**,* denote significance at 1%, 5%, and 10%, respectively.
CC=cabinet changes; GC= government crises; RI1= regime instability index 1; RI2= regime instability index 2; RI3= regime instability index 3; PC= principal component indicator of political instability; WI=weighted index of political instability; GS= General Strikes; DE= Antigovernment demonstrations; AD=adverse regime change.

Table 5. The contemporaneous effect of social conflicts on output-GMM

	Political Instability					Demonstrations		Political instability & Demonstrations		Adverse Regime
	CC	GC	RI1	RI2	RI3	GS	DE	PC	WI	AD
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
S_t	-0.017	-0.027	-0.009	-0.011	-0.009	-0.002	-0.002	-0.006	-0.005	-0.092
	(-4.20)***	(-3.37)***	(-4.23)***	(-4.63)***	(-4.38)***	(-0.82)	(-1.60)*	(-2.93)***	(-2.83)***	(-3.23)***
y_{t-1}	-0.003	-0.005	-0.001	-0.004	-0.002	-0.005	-0.005	-0.006	-0.006	-0.011
	(-0.83)	(-1.78)*	(-0.47)	(-1.19)	(-0.53)	(-1.61)*	(-1.67)*	(-1.71)*	(-1.94)*	(-3.22)***
Δy_{t-1}	0.124	0.142	0.122	0.119	0.128	0.145	0.144	0.143	0.140	0.134
	(2.35)**	(2.95)***	(2.33)**	(2.29)**	(2.89)***	(2.93)***	(2.97)**	(2.84)***	(2.88)***	(2.61)***
Δy_{t-2}	0.038	0.047	0.039	0.040	0.040	0.051	0.053	0.050	0.050	0.037
	(1.14)	(1.52)	(1.07)	(1.20)	(1.11)	(1.61)*	(1.66)*	(1.61)*	(1.61)*	(1.47)
IP_t	-0.003	-0.003	-0.002	-0.004	-0.004	-0.001	-0.001	-0.002	-0.002	-0.002
	(-0.49)	(-1.13)	(-0.35)	(-0.65)	(-0.64)	(-0.64)	(-0.49)	(-0.86)	(-0.63)	(-0.49)
$Open_t$	0.027	0.023	0.026	0.024	0.023	0.028	0.030	0.023	0.024	0.033
	(3.01)***	(2.69)***	(3.00)***	(2.89)***	(2.81)***	(3.39)***	(3.46)***	(2.75)***	(2.70)***	(4.08)***
$Popg_t$	-0.004	-0.005	-0.004	-0.005	-0.005	-0.004	-0.004	-0.004	-0.004	-0.005
	(-1.28)	(-1.62)*	(-1.32)	(-1.52)	(-1.33)	(-1.28)	(-1.29)	(-1.32)	(-1.26)	(-2.09)**
$Time_t$	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000
	(2.42)**	(1.21)	(2.48)**	(2.28)**	(2.25)**	(0.88)	(0.61)	(0.79)	(0.80)	(0.89)
N	3904	4461	3904	3898	3848	4461	4461	4456	4456	4507
Hansen χ^2	173.72	176.12	174.38	173.91	173.47	177.10	177.60	178.30	177.67	178.37
AR(1)	-3.81***	-4.07***	-3.81***	-3.89***	-4.56***	-3.94***	-3.94***	-3.96***	-3.98***	-4.05***
AR(2)	-0.89	-0.85	-0.92	-0.95	-0.89	-0.93	-0.95	-0.90	-0.92	-0.68

Note: z-statistics in parenthesis. ***,**,* denote significance at 1%, 5%, and 10%, respectively.
GMM-System Estimator: Two-step using Windmeijer standard errors, Population growth and Time trend as predetermined, other control variables considered as endogenous (instrumented using up to 2 lags).
CC=cabinet changes; GC= government crises; RI1= regime instability index 1; RI2= regime instability index 2; RI3= regime instability index 3; PC= principal component indicator of political instability; WI=weighted index of political instability; GS= General Strikes; DE= Antigovernment demonstrations; AD=adverse regime change.

Table 6. Governance and probability of instability episodes

	Cabinet Changes			Adverse Regime Changes		
	(I)	(II)	(III)	(IV)	(V)	(X)
Governance $_t$	-0.028	-0.022	-0.027	-0.005	-0.002	-0.003
	(-4.71)***	(-2.57)***	(-3.98)***	(-7.23)***	(-2.03)**	(-3.76)***
Polarization $_t$		0.023			0.001	
		(0.91)			(0.59)	
Fractionalization $_t$		0.224	0.1883		0.001	
		(3.80)***	(4.22)***		(0.20)	
Margin majority $_t$		-0.223	-0.188		-0.001	
		(-3.80)***	(-4.22)***		(-0.19)	
Opposition share $_t$		-0.001			-0.000	
		(-0.68)			(-0.80)	
System $_t$		-0.000			-0.000	
		(-0.99)			(-1.89)*	
Autocracy $_t$		-0.004	-0.002		-0.001	-0.001
		(-2.95)***	(-2.05)**		(-6.53)***	(-7.56)***
Middle-type regime $_t$		0.063			0.008	0.011
		(1.45)			(2.59)***	(3.22)***
N-observations	1381	1032	1194	1952	1417	1717
%-instability episodes	37	37	37	2	2	2
% instability episodes (% non-instability episodes) correctly classified	75 (34)	67(47)	74(40)	83(73)	81(84)	83(83)
Pseudo R^2	0.01	0.03	0.02	0.21	0.39	0.37
$\chi 2$	22.17***	43.95***	35.47***	52.32***	104.28***	140.55

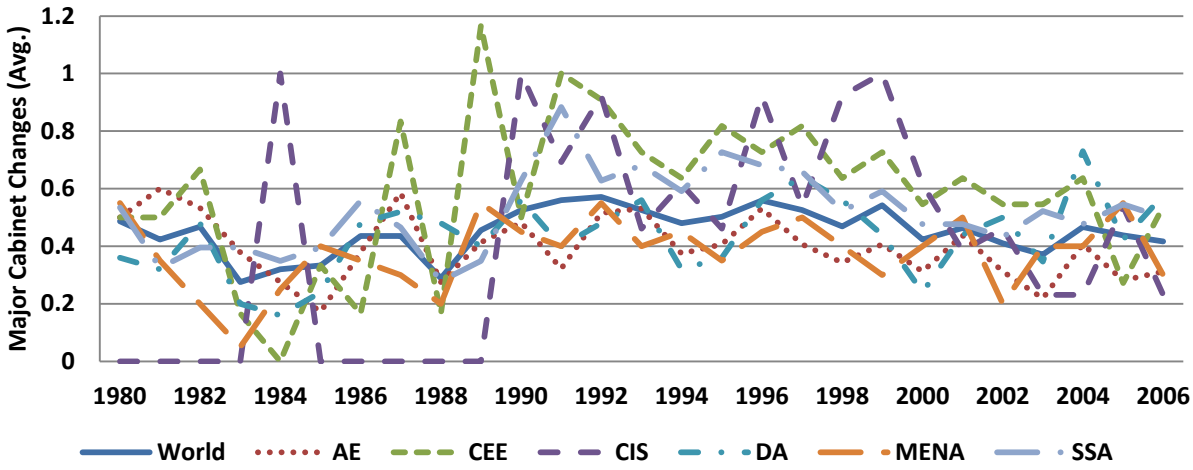
Note: z-statistics in parenthesis. ***,**,* denote significance at 1%, 5%, and 10%, respectively.

Table 7. The effect of induced political instability on output

	(I)^	(II)	(III)	(IV)
Adverse regime changes $_t$	-0.059			
	(-2.29)**			
Induced regime changes $_t$		-0.561	-0.107	
		(-2.70)***	(-1.91)*	
Non-induced regime changes $_t$				-0.054
				(-2.00)**
Governance $_t$			0.020	
			(3.59)***	
y_{t-1}	-0.167	-0.168	-0.172	-0.167
	(-7.57)***	(-7.71)***	(-7.59)***	(-7.53)***
Δy_{t-1}	0.098	0.089	0.080	0.099
	(2.01)**	(1.81)*	(1.56)	(2.05)**
Δy_{t-2}	0.050	0.045	0.039	0.052
	(1.29)	(1.10)	(0.98)	(1.33)
IP_t	0.002	0.001	0.002	0.002
	(0.74)	(0.20)	(0.63)	(0.79)
$Open_t$	0.005	-0.001	-0.006	0.005
	(0.33)	(-0.07)	(-0.34)	(0.33)
$Popg_t$	0.009	0.009	0.008	0.009
	(2.59)***	(2.71)***	(2.47)**	(2.60)***
$Time_t$	0.005	0.005	0.005	0.005
	(6.04)***	(6.26)***	(6.33)***	(6.01)***
N	1917	1917	1689	1917
R^2	0.28	0.28	0.30	0.28

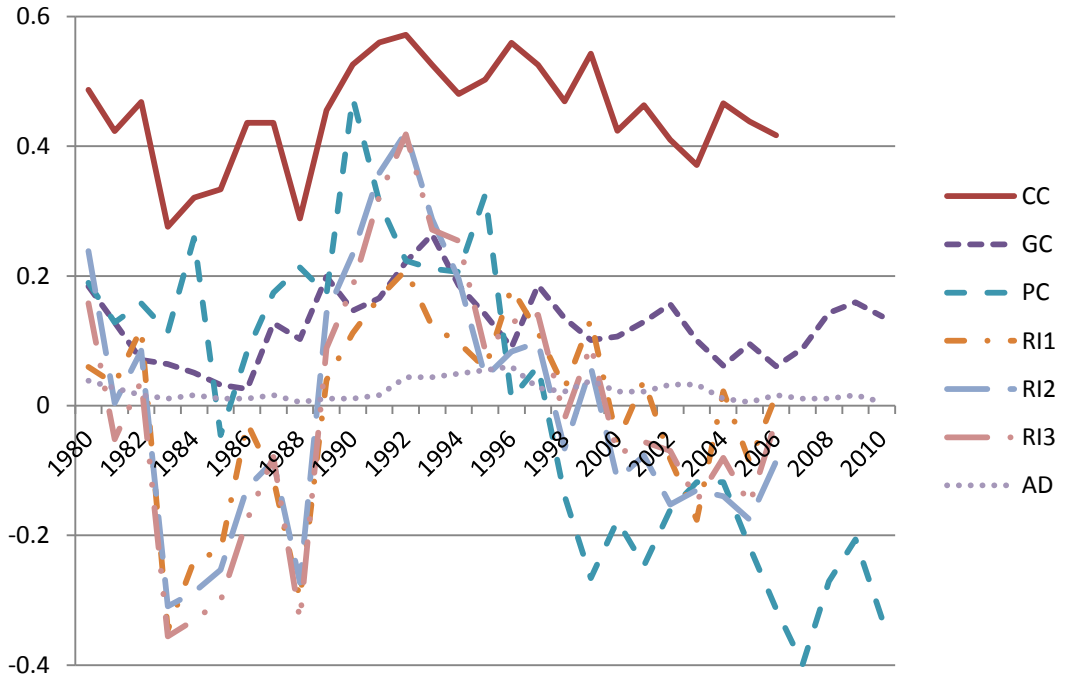
Note: t-statistics based on clustered robust standard errors in parenthesis. ***,**,* denote significance at 1%, 5%, and 10%, respectively. ^ Baseline regression based on a sample for which governance data are available.

Figure 1. Evolution of cabinet changes across regions



AE=Advanced Economies; CEE=Central and Eastern European Countries; CIS=Commonwealth of Independent States; DA=Developing Asia; MENA= Middle East and North Africa; SSA=Sub-Saharan Africa.

Figure 2. Co-movement of different social instability indicators



CC=cabinet changes; GC= government crises; PC= principal component indicator of political instability; RI1= regime instability index 1; RI2= regime instability index 2; RI3= regime instability index 3; AD= adverse regime change.

Figure 3. Contemporaneous growth and cabinet changes

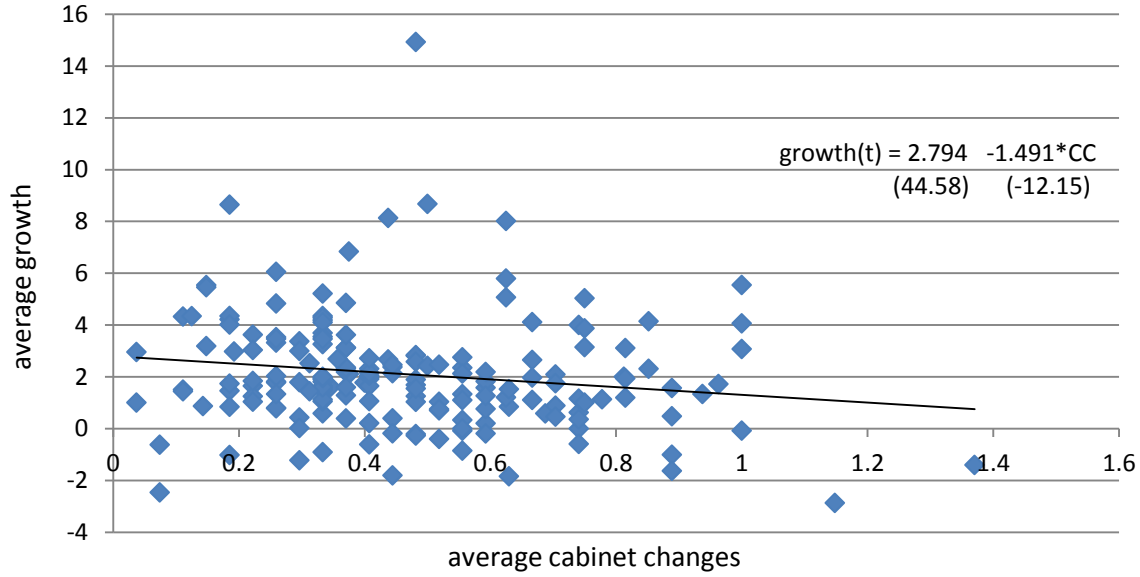


Figure 4. Medium-term output changes and cabinet changes

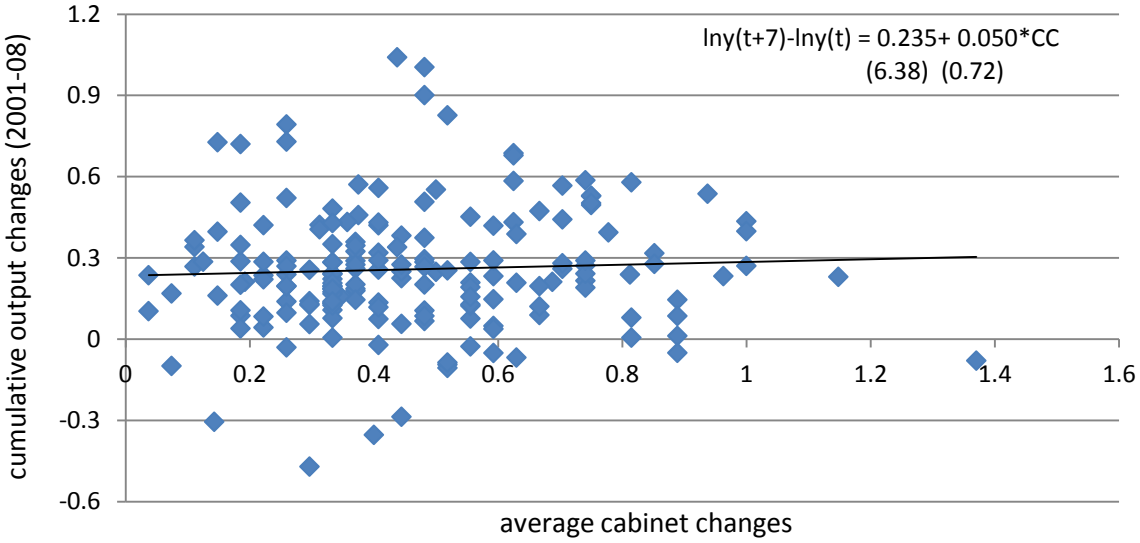
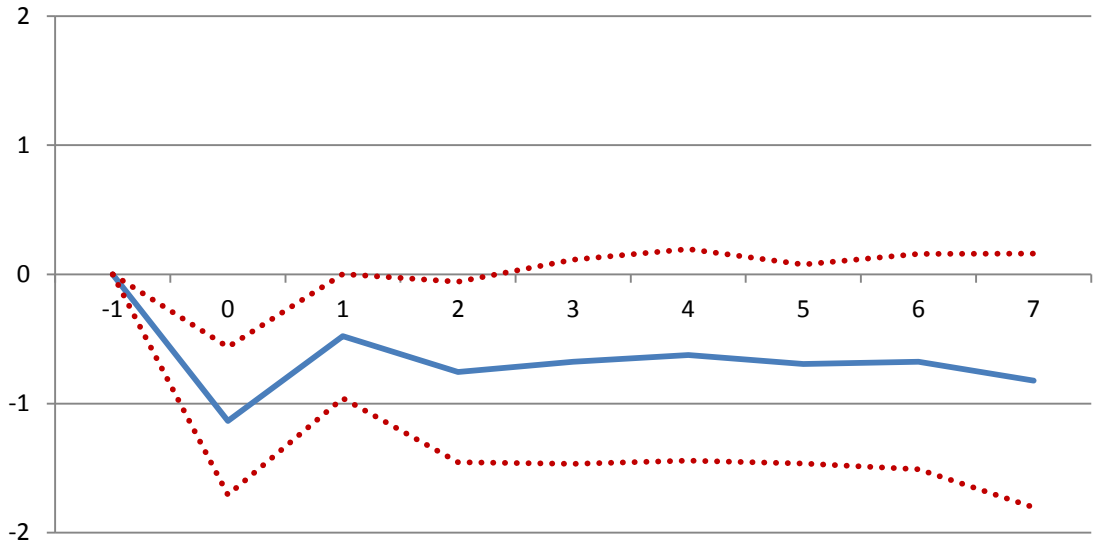
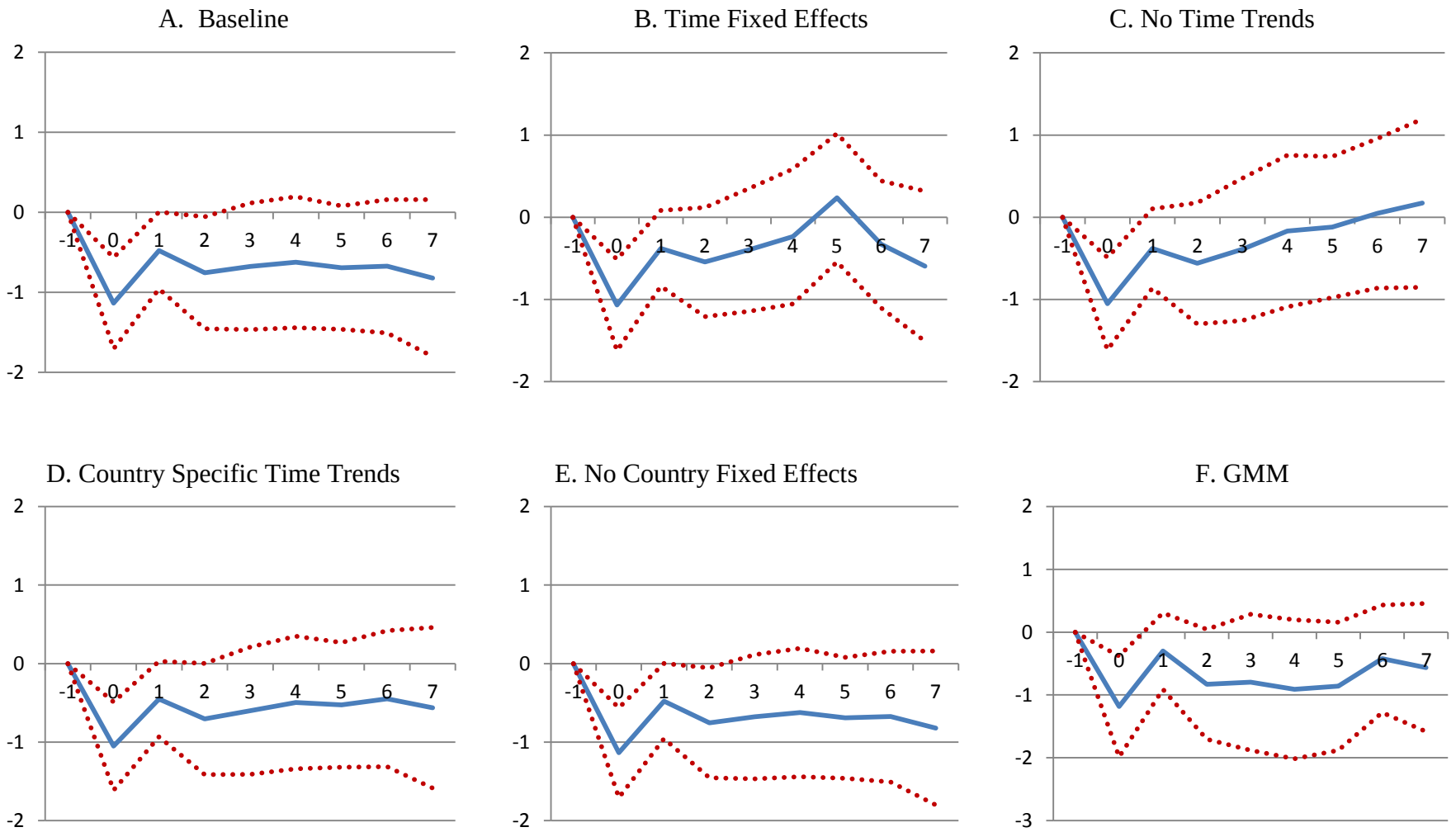


Figure 5. The dynamic effect of cabinet changes on output (percentage points)



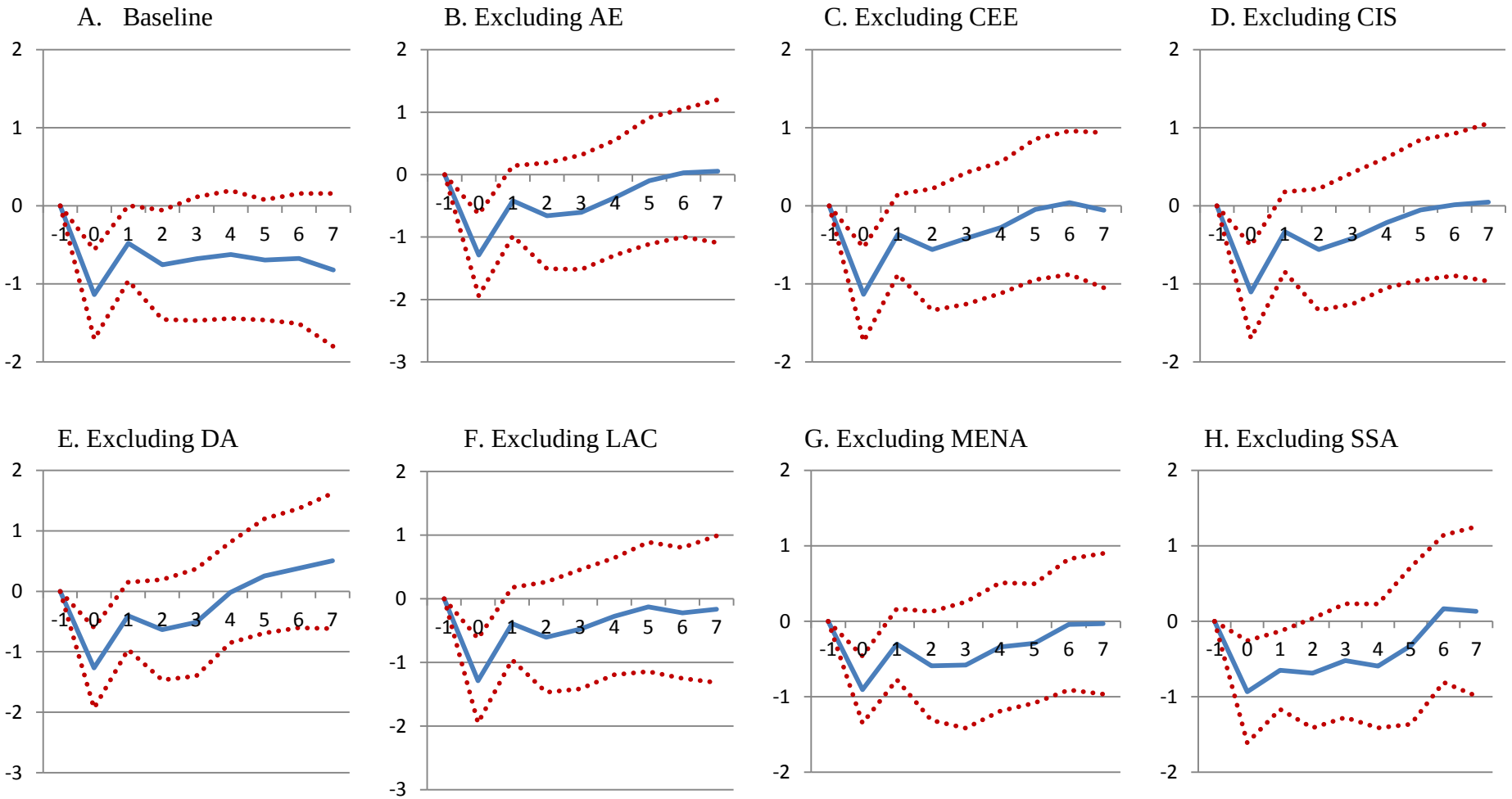
Note: The solid line represents the estimated IRF; dotted lines represent 95% confidence bands. Time (in years) on the *x* axis.

Figure 6. The dynamic effect of cabinet changes on output (percentage points) - Robustness check



Note: The solid line represents the estimated IRF; dotted lines represent 95% confidence bands. Time (in years) on the *x* axis.

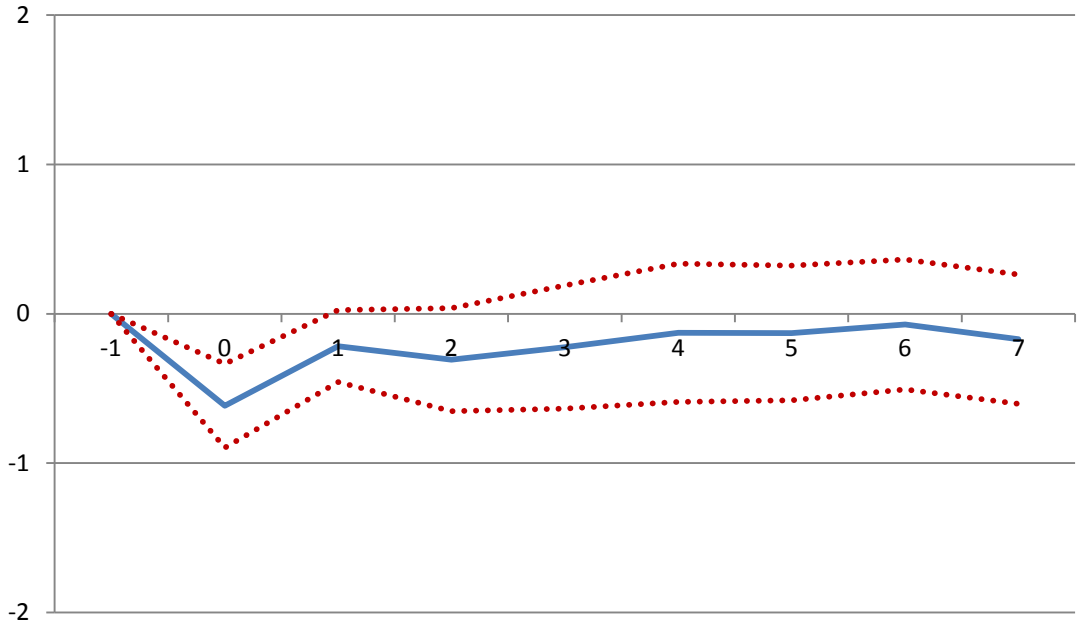
Figure 7. The dynamic effect of cabinet changes on output (percentage points) - Robustness check



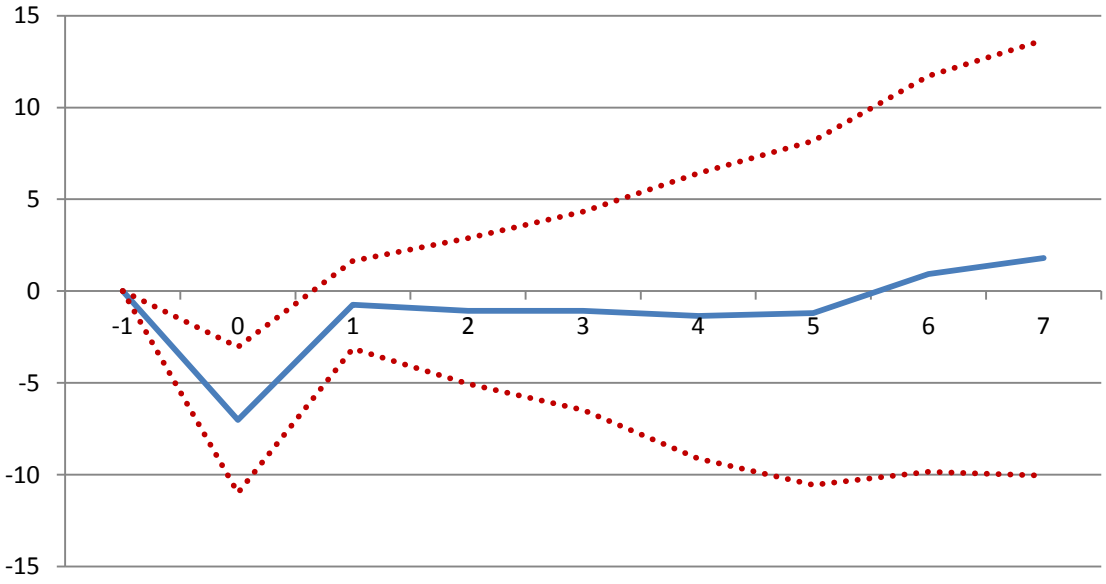
Note: The solid line represents the estimated IRF; dotted lines represent 95% confidence bands. Time (in years) on the *x* axis.

Figure 8. The dynamic effect of social instability indicators on output (percentage points)

Panel A. Regime Instability Index 1



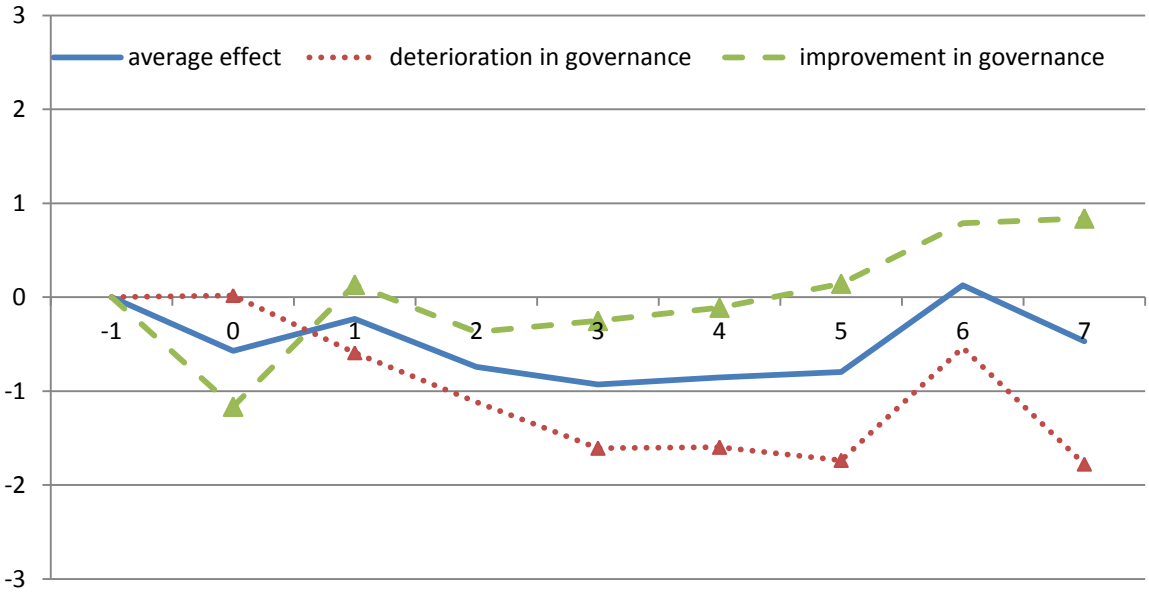
Panel B. Adverse Regime Changes



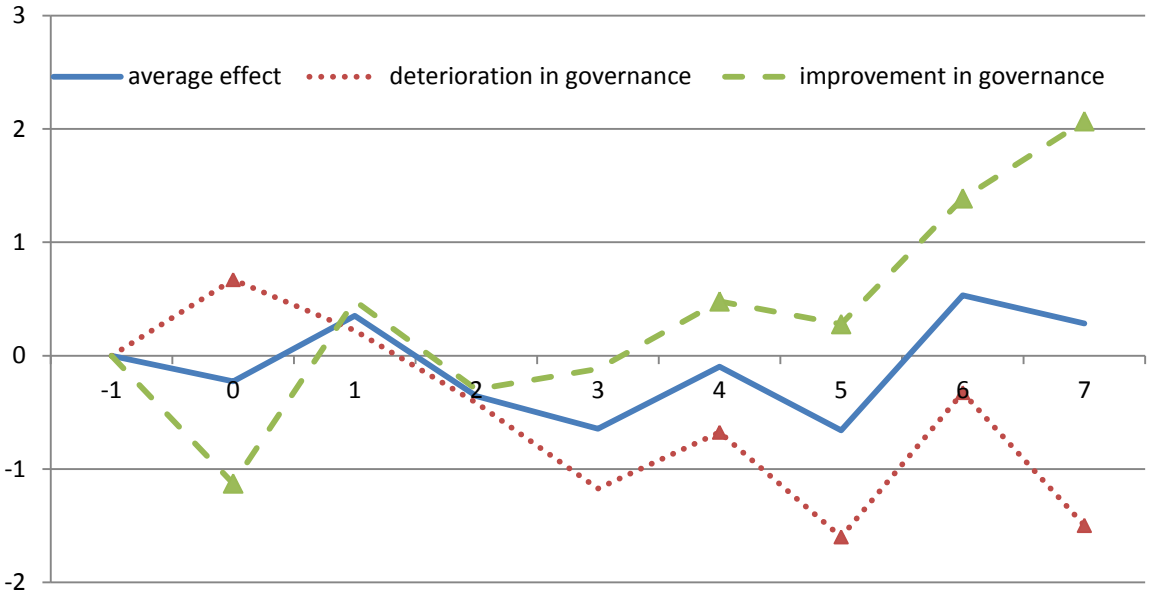
Note: The solid line represents the estimated IRF; dotted lines represent 95% confidence bands. Time (in years) on the *x* axis.

Figure 9. The dynamic effect of cabinet changes conditioning for reforms in governance (percentage points)

Panel A. Reform within 2 years



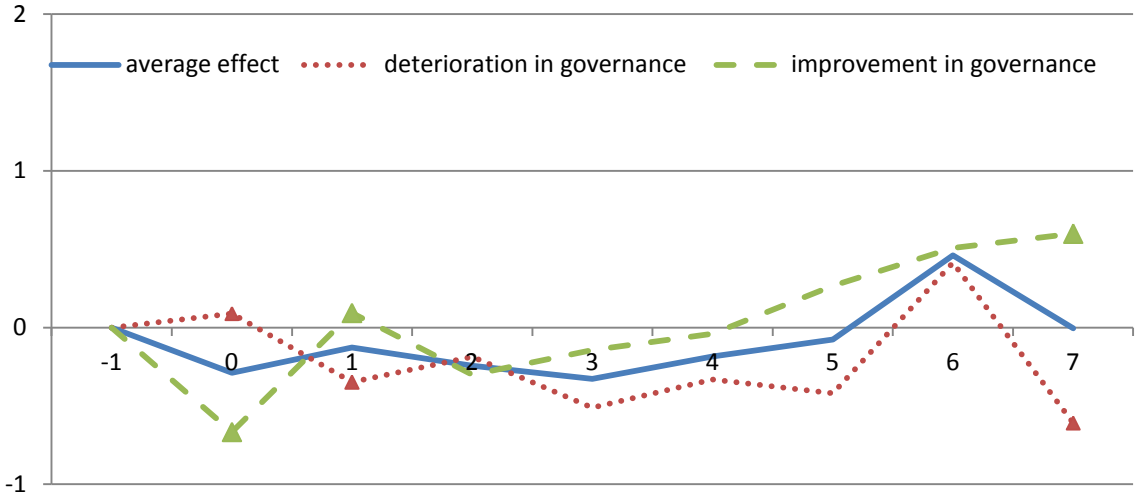
Panel B. Reform within 3 years



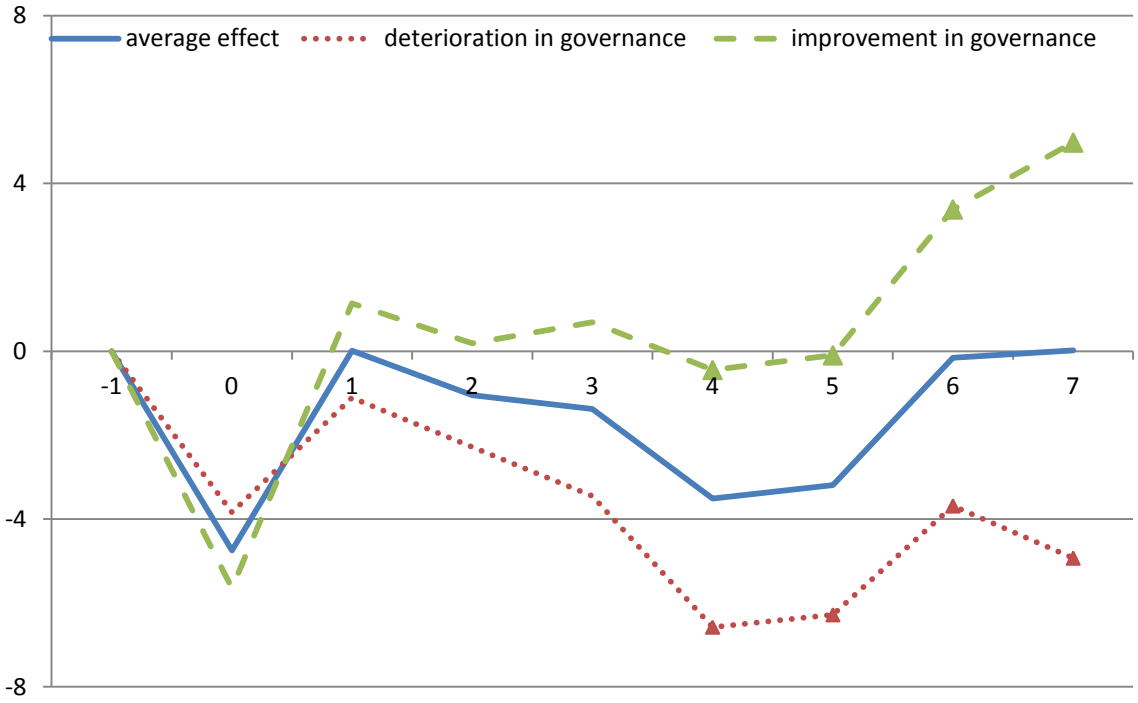
Note: Improvement (deterioration) in governance corresponds to the third (first) quartile of the distribution of the changes in the composite governance. Marked points (Δ) indicate that the interaction term (and the overall impact) is statistically significant at least at 10%.

Figure 10. The dynamic effect of social instability conditioning for reforms in governance –within 2 years (percentage points)

Panel A. Regime instability index 1



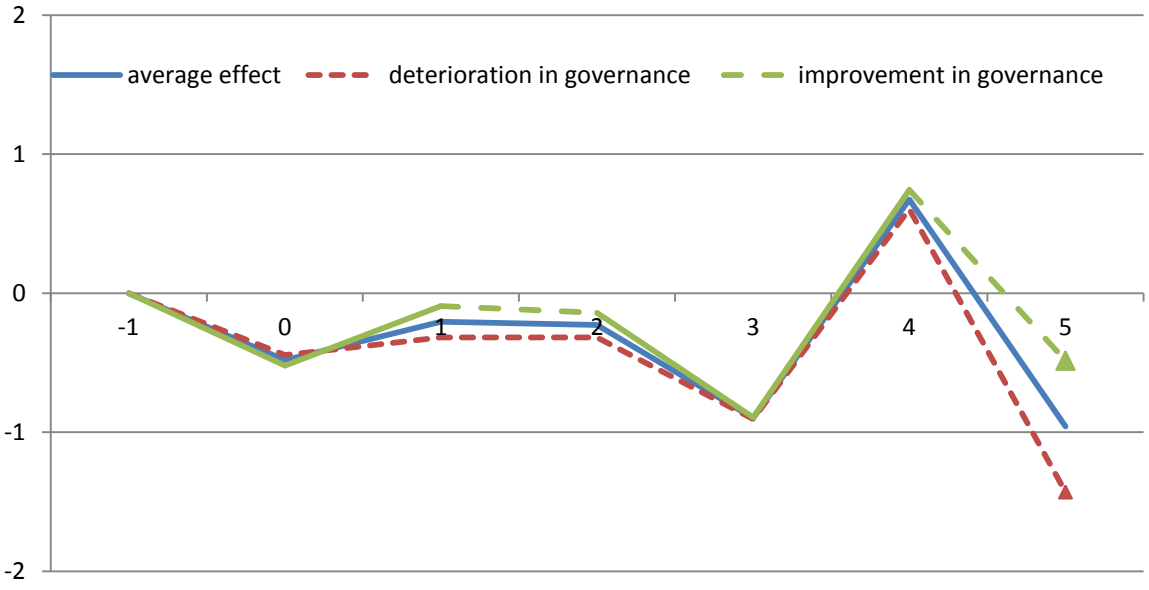
Panel B. Adverse regime change



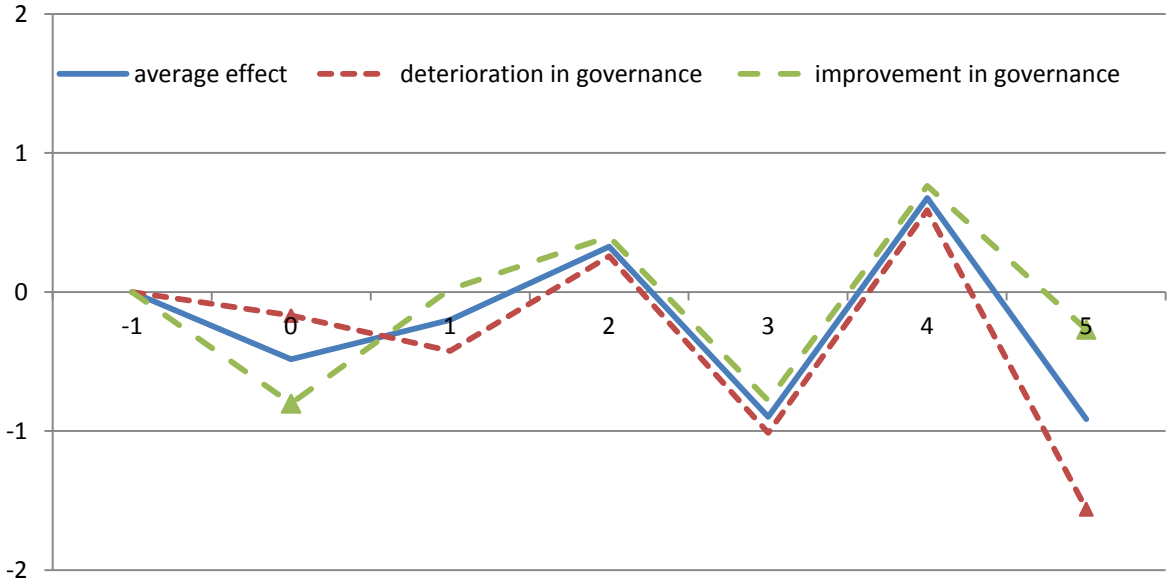
Note: Improvement (deterioration) in governance corresponds to the third (first) quartile of the distribution of the changes in the composite governance. Marked points (Δ) indicate that the interaction term (and the overall impact) is statistically significant at least at 10%.

Figure 11. The dynamic effect of cabinet changes conditioning for reforms in governance (percentage points)-Instrumental Variables

Panel A. Reform within 2 years



Panel B. Reform within 3 years



Note: Improvement (deterioration) in governance corresponds to the third (first) quartile of the distribution of the changes in the composite governance. Marked points (Δ) indicate that the interaction term (and the overall impact) is statistically significant at least at 10%.

Appendix

The composite indicator of product market flexibility considered in the analysis is the one provided by the Fraser Institute's Economic Freedom of the World (EFW) and rates countries between 0 and 10, with higher scores being assigned to economies with better (more flexible) regulations. The indicator is based on the following sub-components: i) Price controls; ii) Administrative requirements; iii) Bureaucracy costs; iv) the Cost of starting a business; v) Extra payments / bribes; vi) Licensing restrictions; and vii) the Cost of tax compliance. The composite indicator of labor market flexibility considered in the analysis is also obtained from the Fraser Institute's Economic Freedom of the World (EFW) and rates countries between 0 and 10, based on the following sub-components: i) Hiring regulations and minimum wage; ii) Hiring and firing regulations; iii) Centralized collective bargaining; iv) Hours regulations; v) Mandated cost of worker dismissal; and vi) Conscription.

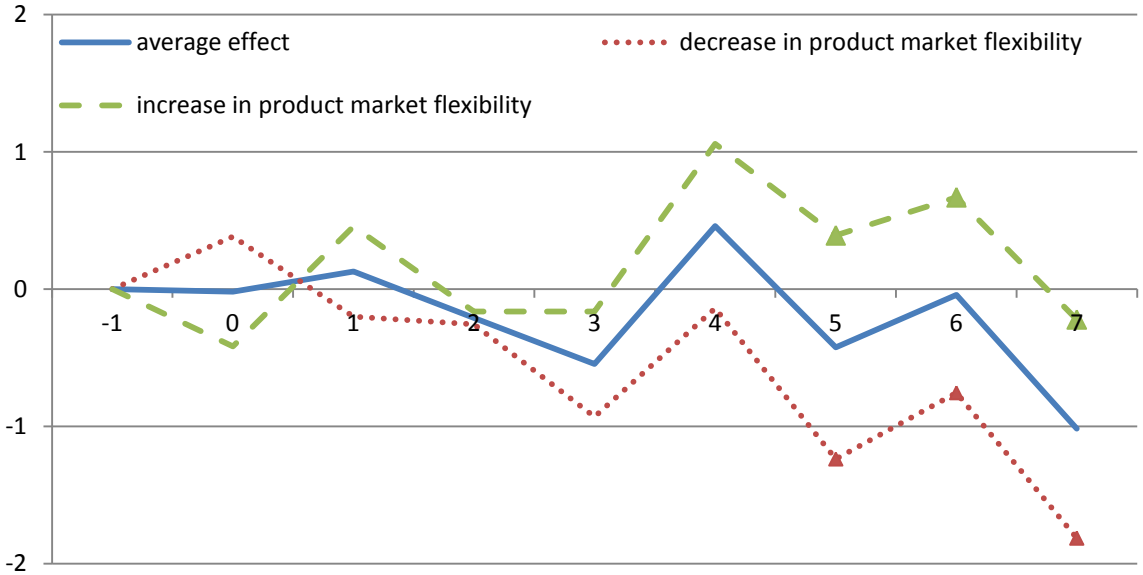
The results obtained estimating equation (3) using the product market flexibility indicator are shown in Figure A1. Looking at the figure, it emerges that the response of output to social conflict over the medium-term is a function of product market flexibility. In particular, the results suggest that seven years after the occurrence of a social instability episode, the contraction in output is about 2 percent larger in countries where product market flexibility has decreased than in countries where flexibility has increased.

Similarly, the results obtained for reforms in the labor market suggest that the response of output to social conflict over the medium-term is also a function of labor market flexibility (Figure A2). However, reforms in labor market seem to be less efficient than reforms in governance and product market flexibility in boosting output over the medium-term. In particular, the results show that in order for medium-term output to be higher than

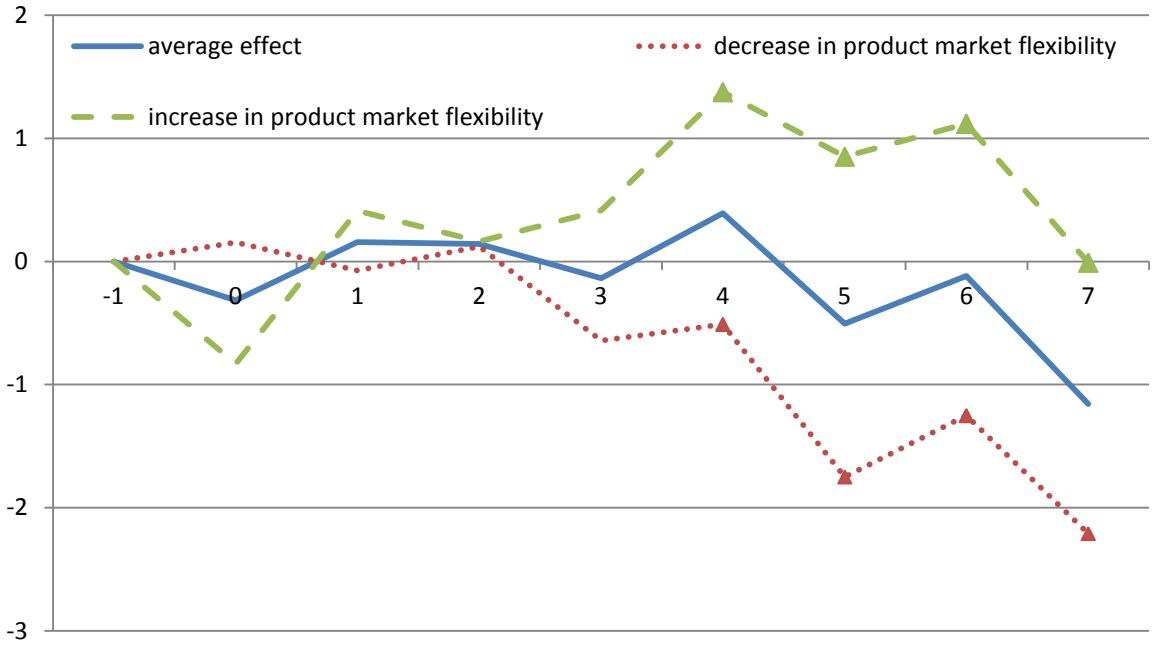
pre-crisis levels, reforms implemented in the labor market have to be of a larger-scale than those in governance or the product market. In addition, while reforms in product market flexibility and governance tend to have significant effects after 5 years of the occurrence of the social instability episode, labor market reforms have significant effects only after seven years.

Figure A1. The dynamic effect of cabinet changes conditioning for reforms in product markets (percentage points)

Panel A. Reform within 2 year



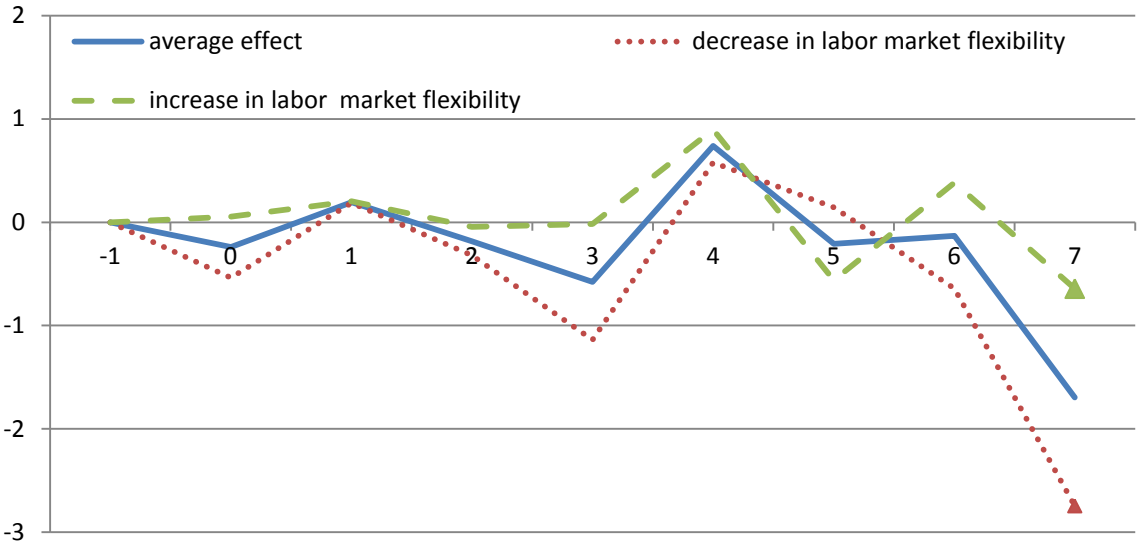
Panel B. Reform within 3 year



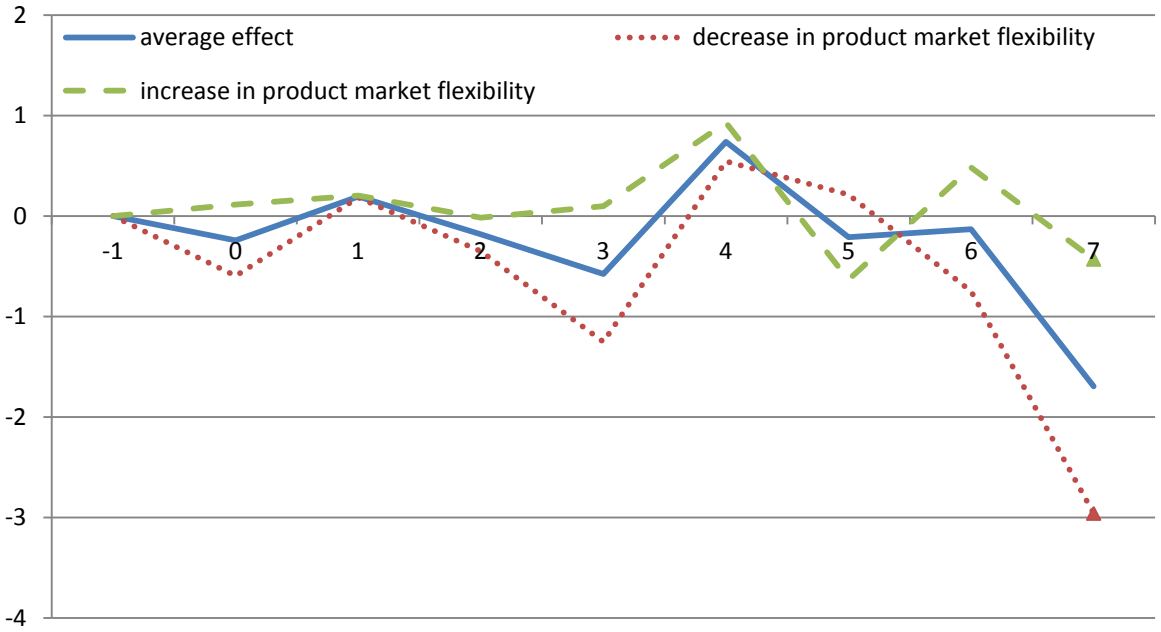
Note: Improvement (decrease) in product market flexibility corresponds to the third (first) quartile of the distribution of the changes in the composite indicator. Marked points (Δ) indicate that the interaction term (and the overall impact) is statistically significant at least at 10%.

Figure A2. The dynamic effect of cabinet changes conditioning for reforms in labor markets (percentage points)

Panel A. Reform within 2 year



Panel B. Reform within 3 year



Note: Improvement (decrease) in labor market flexibility corresponds to the third (first) quartile of the distribution of the changes in the composite indicator. Marked points (Δ) indicate that the interaction term (and the overall impact) is statistically significant at least at 10%.