WHO IS AFRAID OF POLITICAL INSTABILITY?*

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Abstract

An unstable macroeconomic environment is often regarded as detrimental to economic growth. Among the sources contributing to such instability, much of the blame has been assigned to political issues. This paper empirically tests for a causal and negative long-run relationship between political instability and economic growth but finds no such relationship. Sensitivity analysis, however, indicates that there is indeed a short-run negative relationship and, that in the long-run and ignoring institutional factors, the group of African countries is the driving force. In other words, we suspect that excluding the African countries from their samples, results of a negative relation between SPI and growth would founder.

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I. Introduction

An unstable macroeconomic environment is often regarded as detrimental to economic growth. Among the many potential sources of such instability, much of the blame has been assigned to political issues.[1] Socio-political instability (hereafter, SPI) fuels social unrest, which disrupts productive activities and increases overall uncertainty. The negative effects of SPI are then felt throughout the economy. Although these effects have been identified for numerous macroeconomic variables,[2] the litmus test is whether or not SPI causes slower economic growth. These causality issues acquire added importance in light of the profession's renewed interest in economic growth. Despite the fact that the negative relationship between SPI and growth has been elevated to the status of a "stylized fact,"[3] the empirical studies upon which this judgement is made are often criticized for the large numbers of explanatory variables, selected in a seemingly ad hoc manner.[4] Although not fully sharing this criticism, we are convinced that this finding should not be elevated to "stylized fact" status without demonstrating that causality runs from SPI to growth, rather than vice-versa.

The objective of this paper is to investigate the existence (and direction) of a causal relationship between SPI and economic growth. To do so, we construct two different indexes

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[1] Another important source of such instability is policy variability, as formalized by Hopenhayn and Muniagurria (1996). Brunetti (1998) provides empirical evidence.

[2] For instance, among the variables allegedly affected by SPI are the independence of central banks (see e.g. Cukierman, Webb and Neypati, 1992), seigniorage (Cukierman, Edwards, and Tabellini, 1992), aggregate investment (Ozler and Rodrik, 1992), budget deficits (Roubini, 1991), external debt (Alesina and Tabellini, 1989, and Ozler and Tabellini, 1991), and exchange rate regime (Collins, 1996). Excellent examples of the literature on SPI and growth are Alesina, Ozler, Roubini and Swagel (1996), and Ades and Chua (1997).

[3] Distilling the lessons from this literature, Mankiw lists among its robust findings that "political instability, as measured by the frequency of revolutions, coups, or wars, is negatively *associated* with growth" (1995, 302, italics added). Another assessment of what has been learned from such studies is the following "stylized fact" from Persson and Tabellini's chapter for the *Handbook of Macroeconomics*: "Political instability, as measured by more frequent regime changes, or political unrest and violence, is significantly and negatively correlated with growth in cross-country data" (forthcoming, 78).

[4] Durlauf and Quah (1998) provide the most extensive review of this empirical literature and find that more than 80 different explanatory variables have been used thus far.

of SPI for non-overlapping five-year periods, between 1960 and 1995, for 98 developing countries. We use the Granger causality framework and report Anderson-Hsiao-Arellano instrumental variable estimates.[5]

We do not find evidence of the hypothesized negative and causal relationship between political instability and economic growth. Our sensitivity analysis, however, suggests two explanations for the apparent disagreement between our findings and those of the rest of the literature. One is that, for the full sample, the negative relationship obtains only contemporaneously (and independently of whether we use 25 or 5-year averages.) And the second is that, in the long run and ignoring institutional factors, the Sub-Saharan Africa sample seems to be the underlying driving force. In other words, we suspect that excluding the African countries from their samples, the existing results of a negative relation between SPI and growth would founder.

The paper is organized as follows. In the next section we present our two measures of SPI, describe how each index is constructed and map the relationship between them. In section III we discuss the advantages and shortcomings of the Granger-causality framework. In Section IV we present our causality results, reporting Anderson-Hsiao-Arellano instrumental variable estimates. In Section V we subject these results to sensitivity analysis, investigating the extent to which they are affected by a set of structural factors (namely, institutional development and initial conditions). Section 6 concludes.

II. The Measurement of Political Instability

There seem to be two rather different understandings of SPI in the literature. One stresses regular and irregular government transfers, while the other focuses on much harsher

[5] We must note up front that reporting either OLS or Anderson-Hsiao estimates (which are available from the authors upon request) would not change our conclusions. Our choice of reporting Anderson-Hsiao-Arellano estimates is based on the need to address important econometric problems to which most of the literature seems inattentive.

aspects, such as revolutions, *coups d'Etat*, civil wars and political assassinations.[6] That these overlap (e.g. both include irregular government transfers) does little to diminish the different intensities each attach to "instability." While the former interpretation constrains it to relatively tame phenomena, the latter places it closer to social chaos. In an attempt to reflect these nuances, we construct two measures of SPI, one capturing the more severe and the other the less severe forms of SPI. While many other variants could have been used,[7] our justification is that these bound the realistic range of such measures. That is, using both lower (less severe) and upper bound (more severe) measures of SPI should allow us to provide a complete depiction of the causality structure between SPI and growth.

For our measure of "severe" or "upper-bound" SPI, we follow most of the existing literature in using three indicators: the numbers of political assassinations, revolutions and successful *coups d'Etat*.[8] The first is measured as the yearly number of assassinations per million people, while the others are counts of the number of those events in a given year.

For the measure of the "moderate" or "lower-bound" SPI we follow Chen and Feng (1996) and others in the use of indicators from the *Polity III* data collection (Jaegger and Gurr, 1996). A crucial advantage of using this source is its relatively complete country and time coverages. From it, we select the following variables: competitiveness and regulation of political participation; regulation, competitiveness, and openness of executive recruitment; and the legal (de jure) and operational (de facto) independence of the chief executive.[9] Because political actors and processes are to be subject to systematic regulation, this set of indicators

[6] See footnote 3 above.
[7] We are aware of the difficulties of measuring less severe or lower bound SPI and as noted below admit to the need for experimenting with other possible indexes. Our point is simply that an alternative to the traditional, severe or upper bound measure of SPI is needed.
[8] The data source is Barro and Lee (1993).
[9] Maybe a more appropriate lower-bound measure of SPI would include strikes, demonstrations without violence or deaths, regional and internal conflicts, free press, etc. To our knowledge, data on such variables are not available for our sample (98 developing countries, 1960-1995).

should be capable of capturing the extent of even subtle changes in both legal and actual practice. The less regulated are such actors and processes, the greater is the potential for social and political change (and the higher the value of this SPI index. [10])

We collect time series data for the variables underlying the two SPI indexes and real per capita GDP growth rates, covering the period 1960-1995 in an unbalanced panel of 98 developing countries (see Appendix.)[11] There are 14 countries from Asia, 20 from Latin America, 16 from the Middle East and North Africa and 38 from Sub-Sahara Africa.

These two SPI indexes are constructed by the method of principal components (also following most of the literature.) This method is superior because it addresses the latent variable problem and minimizes the inherent arbitrariness in the aggregation procedure. For the severe or upper bound SPI (UBSPI) indicator, the loadings resulting from this procedure are 0.3162 for assassinations, 0.6909 for revolutions, and 0.6502 for coups. In the case of lower bound SPI (LBSPI), the resulting loadings are 0.3923 and 0.1105 for the competitiveness and regulation of political participation (respectively); 0.4677, 0.4734 and 0.3535 for regulation, competitiveness, and openness of executive recruitment; and 0.2317 and 0.4608 for the legal (de jure) and operational (de facto) independence of the chief executive.[12]

Since both indexes are measures of SPI, one would expect them to be positively correlated. Yet, since both capture rather different aspects of SPI, the correlation between them should not be very high. In general, these expectations are fulfilled: with the exception of

[10] Since in Polity III (Jaegger and Gurr, 1996), these indicators are assigned high scores when the extent of regulations is higher (implying lower SPI), for present purposes the coding has been reversed.

[11] Per capita GDP data are from Summers and Heston (1994). We chose an unbalanced panel in order to deviate as little as possible from the rest of the literature. The differences between our sample and those used in other studies are marginal (in terms of the number of countries and time period covered).

[12] We should note that with this data set, we did find a significant negative contemporaneous relationship between our five-year averages of severe SPI and the rate of economic growth for the full sample as well as for each of the regions. However, this negative relationship need not imply causality.

the Middle East and North Africa region, for all other regions the correlation between the respective pairs of SPI indexes is positive and statistically significant (shown in column (1) of Table 1). Although correlation coefficients indicate the extent to which a linear relationship exists, they cannot discern non-linearities that may characterize this relationship (between UBSPI and LBSPI). To get at such non-linearities, in the remaining columns of Table 1 we present some results from two alternative specifications. Column (2) contains the adjusted R^2 of regressions where the dependent variable is LBSPI and the independent variables are UBSPI and squared UBSPI. For the sample as a whole and for each region, the coefficients of both the linear and quadratic UBSPI terms are significant at the 1-percent level, and have negative and positive signs respectively, suggesting that the relationship is indeed highly non-linear. Because a comparison of columns (1) and (2) indicate that for some regions the simple correlation is still superior, in the remaining columns of Table 1 we report the values of the adjusted R^2 and subsequently the regression coefficients from regressions that, in addition to UBSPI and its square, include the cube of UBSPI. Notice that now all adjusted R^2 are higher than the simple correlations, the original sign pattern of the coefficients (minus for the linear term and plus for the squared term) is maintained, and all of them are significant with the exception of the linear term for Asia. On this basis, we claim that our lower-bound SPI index is indeed systematically though non-linearly related to SPI of the more traditional "severe" or upper-bound variety.

Table 1.
The Relationship between the Lower-Bound and Upper-Bound Indexes of SPI

	Simple Correlation	Adj. R^2	Adj. R^2	UBSPI	$UBSPI^2$	$UBSPI^3$
	(1)	(2)	(3)	(4)	(5)	(6)
All LDCs	0.319 [0.0001]	0.2577	0.5616	-1.93816*** (-10.043)	2.89843*** (22.225)	-0.40813*** (-16.989)

Asia	0.284 [0.0001]	0.3840	0.6776	-0.73461 (-1.632)	4.03200*** (10.714)	-0.94505*** (-7.459)
Latin America	0.535 [0.0001]	0.3198	0.6555	-1.08082*** (-3.085)	3.61378*** (13.113)	-0.65841*** (-10.019)
Middle East & North Africa	-0.027 [0.8169]	0.1590	0.5978	-2.91247*** (-6.236)	3.44408*** (10.163)	-0.42997*** (-8.859)
Sub-Saharan Africa	0.319 [0.0001]	0.3419	0.6119	-1.45044*** (-4.925)	3.74465*** (15.281)	-0.72011*** (-11.110)

Notes: Column (1) contains the simple correlation coefficients between the two indexes of socio-political instability (LBSPI and UBSPI). Numbers in brackets are p-values.
Column (2) shows the adjusted R^2 of a regression where the dependent variable is LBSPI and the independent variables are UBSPI and $UBSPI^2$. In all regressions, both coefficients are significant at the 1 percent level, and have negative and positive signs respectively.
Column (3) shows the adjusted R^2 of a regression where the dependent variable is LBSPI and the independent variables are UBSPI, $UBSPI^2$ and $UBSPI^3$.
Columns (4), (5) and (6) contain the coefficients on UBSPI, $UBSPI^2$ and $UBSPI^3$ for the regression which adjusted R^2 is shown in column (3). Numbers in parenthesis are t-statistics. A * denotes that the coefficient is statistically significant at the 10 percent level, ** that it is statistically significant at the 5 percent level, and *** that it is statistically significant at the 1 percent level.

III. The Costs and Benefits of Granger Causality

This section discusses the conceptual and econometric advantages (as well as the limitations) of the Granger-causality framework. This framework has endured the test of time because of its elegance and strong intuitive appeal: the notion that an event in the future cannot cause one in the past.[13] Consider two time series, x_t and y_t. Series x_t is said to Granger-cause series y_t if, in a regression of y_t on lagged y's and lagged x's, the coefficients of the lagged x's are jointly significantly different from zero.

[13] Granger generously remarks that "causation is a non-symmetric relationship, and there are various ways in which asymmetry can be introduced, the most important of which are controllability, a relevant theory, outside knowledge, and temporal priority" (1987, 49.) For discussion see, e.g., Hsiao (1979), and Zellner (1989).

There are two critical issues to be addressed when conducting Granger causality tests.[14] The first concerns the length and frequency of the time lags. On their length, Granger admonishes that "using data measured over intervals much wider than actual causal lags can destroy causal interpretation" (Granger, 1987, p.49). We believe that five year periods are short enough to allow us to investigate the effects of lagged variables, and yet long enough to be meaningful for studying the long-run effects of SPI on economic growth, and vice-versa (Solow, 1997). As for their frequency, there are a number of tests to determine the optimal number of lags but because ours is a short panel we used a grid procedure to evaluate the robustness of the results presented below.

The second issue to be dealt with lies in the information set. The test depends on the assumption that the cause contains unique information about the effect, in the sense that it is exhaustive and unavailable elsewhere. If the information set underlying the test is composed by two series, both of which may be affected by a third variable, the test can be rendered useless. In what follows, we present Granger-causality results that are enlarged by two variables that can potentially play such a disruptive role (namely, an index of institutional development and the initial level of income per capita).

Finally, we need to be attentive to the econometric issues that arise from the addition of the lagged dependent variable, in the right-hand side. This is referred to in the econometric literature as the dynamic panel data problem.[15] It has been established that the lagged dependent variable is correlated with the error term by construction, rendering the OLS estimator biased and inconsistent. To tackle this problem, in this paper we report a variant the instrumental variable approach pioneered by Anderson and Hsiao (1982). This solution

[14] We do not know of other studies that use the Granger framework in the instability-growth context. However, examples of recent studies that use Granger-causality testes in different contexts are Bahmani-Oskooee et al. (1991), Blomstrom et al. (1996), Conte and Darrat (1988), and Oxley (1994).
[15] For discussion see, e.g., Hsiao (1986), Sevestre and Trognon (1992), and Baltagi (1995).

requires first-differencing all variables and using the second lag differences as instruments.[16] We now turn to the results.

IV. Empirical Results

We begin our investigation of the causality patterns between SPI and economic growth in Tables 2 and 3.[17] In Table 2 we ask whether (severe or moderate) SPI Granger-causes per capita GDP growth. In our complete sample of 98 developing countries, we find no evidence of a causal relationship: neither moderate nor severe SPI seems to Granger-cause economic growth. When we break down these results by region, we find a negative relationship only between moderate SPI and growth only for the Sub-Saharan Africa sample. It should also be noted that the effect (i.e., the sign of the relevant coefficient) varies substantially not only by region, but also by the SPI index used. Note that, for the Middle East and North Africa region, the commonly used severe SPI index Granger-causes economic growth. Yet for these countries an increase in the level of SPI is associated with an *increase* in the rate of economic growth.[18]

Table 2.
Does SPI Granger-cause per capita GDP Growth?
(Endogenous variable is Δ GDP$_t$)

	Δ GDP$_{t-1}$	Δ LBSPI$_{t-1}$	Adj. R^2
All LDCs	.101982 (1.48023)	-.160283 (-.730063)	.155673

[16] In fact the results presented below follow Arellano's recommendation (1989) to use as instruments, not the lagged differences, but the lagged levels. Notice, however, that our results are not sensitive to this choice of instruments. These are available from the authors upon request.

[17] Throughout the paper, we use the term "x Granger causes y" as an abbreviation for "past x values show a statistically significant effect on current values of y, given the past history of y".

[18] Campos, Nugent and Robinson (1998) find that in the Middle East and North Africa region, external political instability affect economic performance directly and indirectly (via policy distortions), conditional on the level of internal SPI. Controlling for external political instability renders the coefficient on internal political instability (as above) statistically insignificant.

Asia	.310948 (1.45798)	.355297 (.827956)	.047065
Latin America	-.174380 (-1.27802)	.098049 (.344582)	.326193
Middle East & North Africa	.170138 (1.32522)	-.247338 (-.353851)	.040212
Sub-Saharan Africa	.119167 (1.02201)	-.849987 * (-1.96515)	.053819
(Endogenous variable is Δ GDP$_t$)			
	Δ GDP$_{t-1}$	Δ UBSPI$_{t-1}$	Adj. R^2
All LDCs	.088017 (.904655)	.362853 (1.55692)	.081651
Asia	.359507 (1.24801)	-.342364 (-.828794)	.046476
Latin America	-.055963 (-.309515)	.552850 (1.21228)	.090673
Middle East & North Africa	.168710 (.754868)	1.60205 * (1.83113)	-.019146
Sub-Saharan Africa	.108166 (.774141)	.049422 (.149342)	.289188

Notes: All variables are in first-differences (Δ), five-year averages, between 1960-1995, and t-statistics are in parenthesis. Instrumental variables estimates shown (Anderson-Hsiao-Arellano). *LBSPI* is lower-bound SPI, *UBSPI* is upper bound SPI, *and GDP* is the OLS per capita GDP Growth Rate.

* Statistically significant at the 10 percent level.

** Statistically significant at the 5 percent level.

*** Statistically significant at the 1 percent level.

With respect to the relationship flowing from economic growth to SPI, the results presented in Table 3 fail to reveal any indication of causality.

Table 3.
Does per capita GDP Growth Granger-cause SPI?
(Endogenous variable is lower-bound Δ LBSPI$_t$)

	Δ LBSPI$_{t-1}$	Δ GDP$_{t-1}$	Adj. R^2
All LDCs	.543416 *** (4.47494)	-.003627 (-.332384)	.007559
Asia	.870250 ** (2.55003)	-.015324 (-.351467)	-.010715
Latin America	.581754 *** (2.98801)	.051305 (1.61182)	.001888

Middle East & North Africa	.015866 (.096992)	-.001440 (-.132678)	.016819
Sub-Saharan Africa	.620818 *** (2.78342)	-.027602 (-1.54050)	.002652
(Endogenous variable is upper-bound Δ UBSPI$_t$)			
	Δ UBSPI$_{t-1}$	Δ GDP$_{t-1}$	Adj. R^2
All LDCs	.177311 (1.59093)	-.00209670 (-.110053)	.108217
Asia	.325464 (.871913)	-.073589 (-.878644)	.015380
Latin America	.077570 (.342516)	.067288 (1.55910)	-.006404
Middle East & North Africa	.185418 (1.29201)	.00570600 (.190657)	.010827
Sub-Saharan Africa	.219534 (1.06517)	-.033140 (-1.07556)	.096021

Notes: All variables are in first-differences (Δ), five-year averages, between 1960-1995, and t-statistics are in parenthesis. Instrumental variables estimates shown (Anderson-Hsiao-Arellano). *LBSPI* is lower-bound SPI, *UBSPI* is upper bound SPI, *and GDP* is the OLS per capita GDP Growth Rate.

* Statistically significant at the 10 percent level.

** Statistically significant at the 5 percent level.

*** Statistically significant at the 1 percent level.

Summarizing, the evidence supporting the hypothesis that SPI causes a decrease in the growth rate of per capita income seems much weaker than generally believed. In addition, such a negative and causal relation seems to be largely confined to the Sub-Saharan Africa sample, the only sample for which the relevant coefficient is statistically significant. Finally, we find no evidence whatsoever of causality flowing the other way (i.e., from per capita GDP growth to SPI.) Before discussing these results fully, it is appropriate to subject them to various sensitivity analyses, which is the objective of the next section.

V. Sensitivity Analysis

The objective of this section is to evaluate whether our results are robust to modifications in the two most critical issues in the use of the Granger framework, namely the nature of the time lags (their length and frequency) and the content of the information set.

First, we perform tests on the frequency of the time lags. Having in mind that ours is a short panel, we experimented with including two lags of the "causing variable *x*" (instead of the one lag results presented throughout this paper), and with the exclusion of one lag of the "caused variable *y*." Since none of these changes affect our conclusions, and given our focus on the relation between SPI and *long-term* growth, we keep the length of the lag fixed at five years.[19]

The issue regarding the content of the information set refers to whether there are omitted variables that affect both growth and SPI. A particularly promising candidate for such a role is institutional development. Our measure institutional development is the index of "legislative effectiveness" from Banks (1984). It is selected here because it is available for a large number of developing countries for a long period of time, and conceptually it captures an aspect of institutional development that is closely related to SPI.[20] The unattractive features are that the data are available only until 1984 (thereby forcing us to lose observations) and it is a categorical variable that assumes one of four values, from zero to 3.[21] We mitigate these

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[19] It would be interesting to see under which lag length a causal relationship will appear (that is, whether using one, two or three year lag lengths would change our conclusions; notice, however, that these lengths would be too short for analyzing long-term economic growth). Gupta (1990) has annual data for our severe SPI until 1982. He also mentioned (via personal communication) that the updating of these series (until 1995) is not yet ready. We thus decided to leave this exercise for future work.

[20] For example, the quality of the bureaucracy is another aspect of institutional development, but its relation to SPI is not as direct or clear.

[21] "Legislative effectiveness" (LEGEF) is coded zero if no legislature exists. It is coded '1' for an ineffective legislature, if legislative activity is of a "rubber stamp" character, or the implementation of legislation is faulty or if it is completely subordinate to the executive. LEGEF is coded '2' for a "partially effective legislature": if the executive's power substantially outweighs, but does not

drawbacks by lagging it one period and using 5-year averages. Our working hypothesis is that, in a given country, the level of SPI is contemporaneously negatively correlated with the level of institutional development.[22]

The initial level of per capita income is another natural candidate for having an influence on both SPI and economic growth. The convergence property of the neoclassical growth model suggests that growth should be negatively related to the initial level of income per capita. We conjecture also that lower levels of per capita income may increase the potential for political instability.

Table 4.
Controlling for institutions and initial income, does SPI Granger-cause per capita GDP growth?
(Endogenous variable is ΔGDP_t)

	ΔGDP_{t-1}	$\Delta LBSPI_{t-1}$	$\Delta LEGEF_{t-1}$	$\Delta GDP0_{t-1}$	Adj. R^2
All LDCs	-.099901 (-.793022)	-.127939 (-.579914)	-.310724 (-.657877)	-.000694 (-.843915)	.157788
Asia	.217832 (1.23315)	.025806 (.060398)	.308899 (.390275)	-.001467 (-1.477620	-.059899
Latin America	-.411040* (-1.93362)	-.040021 (-.128262)	-.575221 (-.888192)	-.002343* (-1.67330)	.279734
Middle East & North Africa	.260669 (.624948)	-.285469 (-.334162)	1.63488 (.756562)	.001697 (.654005)	.028613
Sub-Saharan Africa	-.049150 (-.236183)	-.460715 (-.973416)	-1.23415 (-1.34210)	-.000452 (-.245089)	.025113

completely dominate, that of the legislature. Finally, a code of '3' is reserved for an "effective legislature", distinguished by significant governmental autonomy, including its ability to override executive vetoes of legislation.

[22] We find indeed support for the hypothesis that high levels of SPI are associated with low levels of institutional development. The contemporaneous correlation between "legislative effectiveness" and each of our SPI indexes are negative and statistically significant, at the 5 percent level, for our whole sample and each of the four regions individually.

(Endogenous variable is ΔGDP_t)					
	ΔGDP_{t-1}	$\Delta UBSPI_{t-1}$	$\Delta LEGEF_{t-1}$	$\Delta GDP0_{t-1}$	Adj. R^2
All LDCs	-.272948* (-1.84204)	.219158 (.932017)	.-.524852 (-.886105)	-.001768* (-1.89236)	.215234
Asia	.243242 (.977085)	.018053 (.044311)	-.654817 (-.620857)	-.001444 (-1.42580)	-.074133
Latin America	-.848040*** (-2.68874)	-.256357 (-.502485)	-1.02379 (-1.14927)	-.006313*** (-3.14233)	.289302
Middle East & North Africa	.341391 (.593774)	1.82170 (1.33377)	2.28172 (.867335)	.002853 (.814455)	-.102793
Sub-Saharan Africa	-.215917 (-1.05915)	.075596 (.229527)	-1.19105 (-1.14784)	-.001621 (-.924678)	.210844

Notes: All variables are in first-differences (Δ), five-year averages, between 1960-1995, and t-statistics are in parenthesis. Instrumental variables estimates shown (Anderson-Hsiao-Arellano). *LBSPI* is lower-bound SPI, *UBSPI* is upper-bound SPI, *GDP* is the OLS per capita GDP Growth Rate, *LEGEF* is an index of legislative effectiveness (institutional development), and *GDP0* is level of initial per capita income.

* Statistically significant at the 10 percent level.

** Statistically significant at the 5 percent level.

*** Statistically significant at the 1 percent level.

In what follows, we present results obtained by adding these two dimensions (initial income and levels of institutional development) to the specifications for the Granger-causality tests reported in the previous section. In Table 4 we investigate whether or not SPI Granger-causes GDP growth, once we control for the levels of institutional development and initial income. There are two important changes compared to Table 2: first, a rise in lower bound SPI ceases to Granger-cause (a decrease in) economic growth in Sub-Saharan Africa and, second, a rise in severe SPI ceases to Granger-cause (an increase in) GDP growth in the Middle East and North Africa. It is worth noting that it is the inclusion of the institutional variable that makes the coefficient for Sub-Saharan Africa statistically insignificant but it is the inclusion of initial income per capita that does so for the Middle East and North Africa's. In other words, the result for Sub-Saharan Africa from Table 2 holds with initial income in the specification (provided the institutional development variable is not included) and the result for

the MENA region holds with the institutional development in the specification (provided initial income is not included).

In Table 5 we ask whether economic growth Granger-causes SPI, once we control for the levels of institutional development and initial income. Recall that from Table 3 we did not obtain any indication of causality flowing in this direction, irrespective of the SPI index used or of the regional breakdown. All the results hold, with one exception. The coefficient on economic growth for Latin America turns out to be statistically significant after we enlarge the information set. Moreover, the result indicates that a rise in the rate of per capita economic growth in this region seems to Granger-cause a rise in the level of our moderate index of socio-political instability. Further investigation revealed that it is the inclusion of the institutional development variable that is responsible for this change.[23] The identification of the precise mechanism for this destabilizing effect of economic growth in Latin America is left for future work.

Table 5.
Controlling for institutions and initial income, does GDP per capita growth Granger-cause SPI?
(Endogenous variable is Δ LBSPI$_t$)

	Δ LBSPI$_{t-1}$	Δ GDP$_{t-1}$	Δ LEGEF$_{t-1}$	Δ GDP0$_{t-1}$	Adj. R^2
All LDCs	.241667**	.001460	-1.21630***	-.000082	.298338
	(2.51915)	(.106914)	(-12.6326)	(-.604501)	
Asia	.212834	.006572	-1.23008***	-.000027	.418065
	(.948019)	(.210992)	(-6.44086)	(-.114898)	
Latin America	.197626	.070435**	-1.51822***	.000166	.414488
	(1.27543)	(2.14353)	(-8.82059)	(.541064)	
Middle East & North Africa	-.012567	-.036122	-.542633**	-.000476 *	.078165
	(-.066910)	(-1.19802)	(-2.19795)	(-1.89664)	
Sub-Saharan Africa	.490306***	-.029438	-1.07150***	-.000153	.255005

[23] Notice that including only initial income in the relevant specification from Table 3 also makes the coefficient on economic growth become statistically significant, although only marginally at the 10 percent level. It is on this basis that we claim that the institutional variable is responsible for the change.

	(2.73276)	(-1.38838)	(-6.23833)	(-.601373)	
(Endogenous variable is Δ UBSPI$_t$)					
	Δ UBSPI$_{t-1}$	Δ GDP$_{t-1}$	Δ LEGEF$_{t-1}$	Δ GDP0$_{t-1}$	Adj. R^2
All LDCs	.023900 (.238744)	-.005830 (-.284849)	-.796847*** (-4.98379)	-.000130 (-.659980)	.080905
Asia	.170841 (.536400)	-.065159 (-.858917)	-1.05159** (-2.32080)	-.000046 (-.104656)	-.000423
Latin America	-.034635 (-.162371)	.068619 (1.45854)	-.727868*** (-2.91017)	-.000053 (-.123021)	.142759
Middle East & North Africa	.047810 (.280701)	-.019980 (-.477918)	-.471677 (-1.48426)	-.000257 (-.774756)	-.034517
Sub-Saharan Africa	.003319 (.019613)	-.029328 (-.894690)	-1.07179*** (-3.39197)	-.000064 (-.158291)	.095598

Notes: All variables are in first-differences (Δ), five-year averages, between 1960-1995, and t-statistics are in parenthesis. Instrumental variables estimates shown (Anderson-Hsiao-Arellano). *LBSPI* is lower-bound SPI, *UBSPI* is upper-bound SPI, *GDP* is the OLS per capita GDP Growth Rate, *LEGEF* is an index of legislative effectiveness (institutional development), and *GDP0* is level of initial per capita income.

* Statistically significant at the 10 percent level.

** Statistically significant at the 5 percent level.

*** Statistically significant at the 1 percent level.

VI. Conclusions

The objective of this paper was to investigate the existence (and direction) of a causal relationship between SPI and economic growth. We find that the evidence supporting the hypothesis that high levels of SPI cause lower rates of economic growth is much weaker than generally believed, as we find no traces of a long-run causal relationship. How can this be reconciled with the results from other studies? Our sensitivity analysis points towards a major role played by the Sub-Sahara Africa sample. Not only the Sub-Saharan African sample is much larger than those for other regions, but also SPI in Africa seems to be of a more structural nature. Our finding that, once one controls for institutional development, the causality results vanish supports this latter explanation. On this basis, this paper raises the suspicion that excluding the African countries from their samples, the existing results of a negative relation between SPI and growth would founder.

Given the prominence the issue of political instability plays in recent macroeconomic research in general (and in political economics in particular), there are a number of suggestions for further research that should be put forward. First, in light of the inconsistency between existing results (of a negative contemporaneous relation between SPI and economic growth) and our own findings (of the lack of a causal negative relationship between SPI and growth), one should ask at what frequencies and lag lengths does the relationship change from non-causal to causal? As noted before, this is an important question we leave for future work. As soon as high frequency data are available, attention should focus on this question.

Second, there should be considerable scope to identify additional omitted variables, especially those of an institutional nature, which might be related to both SPI and growth. Numerous institutional variables may be relevant, like the fairness and effectiveness of the judicial system and the stability of property rights. Indeed, in a cross-sectional framework Keefer and Knack (1995) find that, once these are taken into account, the negative effect of SPI on growth vanishes. Another important candidate for such an omitted variable role, following Persson and Tabellini (1992, 1994) and Alesina and Perotti (1996), might be the level of income inequality. Notice, however, that the data (on income distribution and institutions) needed for these "enlargements" of our Granger tests are presently not available.

Third, given the difficulties in constructing a lower-bound measure of socio-political instability, exploratory research of this sort with other SPI measures should be encouraged.

Still another useful direction for future research would be to experiment with different causality frameworks which can accommodate different lag structures as well as richer information sets (Hsiao, 1979; Geweke et al., 1983). In addition, future work should also be attentive to the myriad of econometric issues involved in dealing with unbalanced dynamic short panels (Baltagi, 1995).

Finally, in the light of the wide variety of other consequences that have been alleged to SPI, and to which we referred to in our introduction, serious consideration should also be given to the examination of causal relationships between SPI and these other variables. In particular, it would be interesting to see whether the Sub-Saharan Africa sample would again play such a determinant role.

Appendix:
Sample of 98 developing countries
(Number of countries in parenthesis)

Asia (14): Bangladesh, China, Indonesia, India, South Korea, Laos, Malaysia, Myanmar, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, and Thailand.

Latin America (20): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Paraguay, Trinidad and Tobago, Uruguay, and Venezuela.

Middle-East and North Africa (16): Algeria, Bahrain, Cyprus, Egypt, Iran, Iraq, Jordan, Kuwait, Morocco, Oman, Saudi Arabia, Syria, Tunisia, Turkey, United Arab Emirates, and Yemen.

Sub-Saharan Africa (38): Angola, Burundi, Benin, Burkina Faso, Botswana, Cameroon, Central Africa Republic, Chad, Congo, Ethiopia, Gabon, Ghana, Guinea, Guinea Bissau, Ivory Coast, Kenya, Liberia, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Sudan, Senegal, Sierra Leone, Somalia, South Africa, Togo, Tanzania, Uganda, Zaire, Zambia, and Zimbabwe.

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