

Asongu, Simplice; Nwachukwu, Jacinta C.

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## The Arab Spring was predictable in 2007: Empirics of proof

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# A G D I Working Paper

WP/17/052

## **The Arab Spring was predictable in 2007: Empirics of Proof**

Forthcoming in the Africagrowth Agenda

**Simplice A. Asongu**

African Governance and Development Institute,  
P.O. Box 8413, Yaoundé, Cameroon.

E-mails: [asongusimplice@yahoo.com](mailto:asongusimplice@yahoo.com) / [asongus@afridev.org](mailto:asongus@afridev.org)

**Jacinta C. Nwachukwu**

School of Economics, Finance and Accounting,  
Faculty of Business and Law, Coventry University Priory Street,  
Coventry, CV1 5FB, UK

Email: [jacinta.nwachukwu@coventry.ac.uk](mailto:jacinta.nwachukwu@coventry.ac.uk)



Research Department

**The Arab Spring was predictable in 2007: Empirics of Proof****Simplice A. Asongu & Jacinta C. Nwachukwu**

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**Abstract**

We model core demands for better governance (political, economic and institutional), more employment and less consumer price inflation using a methodological innovation on the complete elimination of cross-country differences in signals susceptible of sparking social revolts. The empirical evidence based on 14 MENA countries show that the Arab Spring was predictable in 2007 to occur between January 2011 and April 2012. While the findings predict the wave of cross-country revolutions with almost mathematical precision, caveats and cautions are discussed for the scholar to understand the expositional dimensions of the empirics.

*JEL Classification:* N17; O11; O20; O47; P52*Keywords:* Arab Spring; Political Instability; Timing; Economic Growth**1. Introduction**

The Arab Spring has prompted many academics to revise their paradigms and initial claims, raising concerns about the usefulness and legitimacy of existing theories. While the promptness of scholars to recognize their inabilities to foresee major politico-economic unrests is not new, the apologetic stances for failure to predict the Spring has reignited



another debate as to whether such cross-country uprisings were predictable in the first place (Adi, 2013). This debate is even more relevant with Mitchell (2004, p. 76) postulating that by virtue of facts and figures, future trends should be predicted by social sciences with almost mathematical precision. This note aims to investigate this Mitchell conjecture. The paper attempts to practically answer the key concern on whether politico-economic trends were common in the Middle East & North African (MENA) countries prior to the Arab Spring.

In the present empirical exercise, we are fully aware of shortcomings of investigating a problem without a sound underlying theory. Nonetheless, the act of facts reporting remains a useful scientific activity, even without a formal theoretical model. In this vein, we borrow from recent literature in the postulation that the validation or refutation of economic theories is not the only end of applied econometrics (Narayan et al., 2011).

From a theoretical standpoint, the Arab Spring could have either been a predictable phenomenon or a spontaneous occurrence. Given the former hypothesis and the catch-up intuition motivating the empirical underpinnings, one principal question comes to mind: does the complete absence of dispersions in factors that cause social revolts among countries foretell a general cross-country chaos? Two underlying assumptions address this question. First, the presence of catch-up in signals that cause social uprisings means that countries with bad signals are reaching the levels of their counterparts with worse signals. Second, full catch-up implies that cross-country disparities in signals of revolt are inexistent such that there are no distinctions between locality and nationality in the degree of such signals. While the answer to the first question informs the policy maker about the feasibility of cross-country revolutions, the answer to the second question indicates the timing for such a revolution without distinction of nationality. Such negative signals include, inter alia: governance standards (institutional, political and economic), unemployment and consumer price inflation.

The intuition for a possibility of cross-country harmonization in factors of a common event with a timeline conditional on the full (100%) catch-up period has been recently



employed in a plethora of development areas (Narayan et al., 2011; Asongu, 2013a, 2013b; Asongu & Nwachukwu, 2016). The rest of the paper is organized as follows.

## **2. Data and Methodology**

### **2.1 Data**

We investigate a panel of fourteen MENA countries with data from Development Indicators of the World Bank for the period 1996-2006 such that we have a projection date of 2007. The dependent variables represent potentially negative signals of unrest: unemployment, consumer price inflation and quality of government (institutional, political & economic). The governance indicators are composite variables obtained from Principal Component Analysis. The endogenous variables have been substantially documented in the Arab Spring literature as possible causes of the uprisings (Khandelwal & Roitman, 2012). Categorization of the government quality variables is in accordance with Kaufmann et al. (2010). *Economic governance* is represented by *regulation quality* and *government effectiveness*. *Institutional governance* is proxied by *corruption-control* and *rule of law*. *Voice & accountability* and *political stability* are used for *Political governance*. *Political governance* is the process by which authorities are selected and replaced; *Economic governance* represents the capacity of government to formulate & implement policies as well as deliver services and; *Institutional governance* denotes the respect for citizens and the state of institutions that govern the interactions among them. We control for determinants of the revolutions that have been documented in recent literature (Khandelwal & Roitman, 2012). These include, *inter alia*: *economic prosperity*, *external balances*, *population growth*, *government expenditure*, and *trade openness*. In what follows, we briefly substantiate the relevance of the control variables.

Political unrest can result from the deterioration of macroeconomic conditions. Hence, macroeconomic uncertainty in the perspectives of negative and poor economic growth is



likely to increase unemployment owing to decreased economic output. From intuition, vulnerabilities to external shocks can fuel socio-political unrest partly due to currency depreciation and high inflation. High inflation generates inefficiencies that could ultimately fuel social tensions because of reduced social welfare and economic growth (see Aisen & Veiga, 2006) and decreased opportunities of investment because investors prefer less ambiguous economic environments (Kelsey & Le Roux, 2017a, 2017b). Employment and other socio-economic opportunities can be boosted through trade and more conducive government expenditure. In addition, if population growth is associated with government capacity to deliver more public goods and better living standards, the likelihood for political instability would be limited.

## 2.2 Methodology

The adoption of *beta*-convergence as estimation technique is typically consistent with the recent empirics (Narayan et al., 2011; Asongu, 2013b). The following two equations are the standard procedures for investigating this *beta* catch-up if  $W_{i,t}$  exhibits strict exogeneity (Fung, 2009).

$$\ln(Y_{i,t}) = a \ln(Y_{i,t-\tau}) + \delta W_{i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

where  $a = 1 + \beta$ ,  $Y_{i,t}$  measures the signals of social unrest (*inflation, unemployment and bad governance*) in country  $i$  at period  $t$ .  $W_{i,t}$  is a vector of determinants of the negative signals,  $\eta_i$  is a country-specific effect,  $\xi_t$  is a time-specific constant and  $\varepsilon_{i,t}$  is an error term. Consistent with the neoclassical growth model, a significantly negative *beta* coefficient in Eq. (1) implies that countries relatively close to a state in which dependent variables will experience a slowdown in growth, known as conditional convergence (Narayan et al., 2011, p.



2773). In the same light, consistent with Fung (2009, p. 59), when  $0 < |a| < 1$  in Eq. (1),  $Y_{i,t}$  is dynamically stable. A means of dealing with the concern about the correlation between the individual specific-effect and the lagged dependent variable involves suppressing the individual-effect by first differencing. Therefore, Eq. (2) becomes:

$$\ln(Y_{i,t}) - \ln(Y_{i,t-\tau}) = a(\ln(Y_{i,t-\tau}) - \ln(Y_{i,t-2\tau})) + \delta(W_{i,t-\tau} - W_{i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \quad (2)$$

We then employ the *two-step* system Generalized Method of Moments (GMM) that exploits all the orthogonality conditions between the lagged endogenous variable and the error term. Islam (1995, p. 323) has emphasized that yearly times are inappropriate for investigating convergence because in such brief yearly time spans, short-term disturbances may be considerable. To assess the rate of diminishing dispersion in the signals of social unrests, we calculate the implied rate of convergence by computing:  $a/2$ . This implies in our regressions,  $\tau$  is set to 2. Thus, because we have used two-year NOI to control for business cycle disturbances, we divide the estimated value of the lagged dependent indicator by 2. To ascertain evidence of catch-up, the criterion used is the following:  $0 < |a| < 1$ . This implies that past differences have less proportionate effect on future differences.

### 3. Empirical Analysis

Table 2 summaries the findings from Table 3 below. Absolute or unconditional catch-up is assessed with only the lagged difference of the endogenous variable whereas conditional convergence is investigated in the presence of  $W_{i,t}$ . But for political governance (in both panels of Table 3) and inflation (Panel B of Table 3) in which there is some evidence of autocorrelation at the 10% significance level, the models are overwhelmingly valid: (1) failure to reject the null hypotheses of AR(2) and Sargan tests and (2) the null hypothesis of the Wald test is rejected.



For an estimated initial value of 0.98 (the instruments are significant and there is no autocorrelation in the residuals), the following could be established: (1) the catch-up rate is 49.00%  $((0.98/2) \times 100)$  and; (2) the length of time needed for full catch-up is 4.08 years  $(200\%/49.00\%)$ . Therefore, 4 years (yrs) and about 29 days are needed to reach a 100% catch-up for an estimated initial value of 0.98 that is consistent with the information criterion:  $0 < |a| < 1$ . In other words 4 years 29 days are needed for complete elimination of cross-country dispersions of signals the cause social unrests. Catch-up from an economic point of view implies that countries with lower levels in an economic signal are catching-up their counterparts with higher levels in the economic signal. Full catch-up further implies cross-country difference in the economic signal no longer exist. Hence, full catch-up provides feasible avenues for harmonized policies related to the economic signal to be implemented without distinction of country within a homogenous panel. Whereas the notion of catch-up has fundamentally been based on positive macroeconomic variables such as per capita positive signals (Jones, 2002; Ssozi & Asongu, 2016) and finance (Narayan et al., 2011; Bruno et al., 2012; Asongu, 2013c), there is a recent stream of literature that has extended to notion policy harmonization in negative signals, notably, in the fight against: software piracy (Andrés & Asongu, 2016); capital flight (Asongu, 2014) and terrorism (Asongu & Nwachukwu, 2017; Asongu et al., 2018). The argument behind extending the notion of catch-up in economic phenomena to negative economic signals is that it is also logical to harmonize cross-country policies in view of fighting negative socio-economic and political signals.

Against this background the following conclusions could be drawn. (1) The findings of political governance are not significant. (2) Economic, institutional and general governance results averagely reflect a full catch-up period of between 4.08 and 5.26 years. (3) For inflation and unemployment, only the results of absolute convergence are significant, with



those of the latter broadly consistent with the findings from governance indicators (timing of 5.06 years).

**Table 2: Summary of results**

	Political Governance	Economic Governance	Institutional Governance	General Governance	Inflation	Unemployment
<b>Panel A: Absolute Catch-up</b>						
Absolute Catch-up	No	Yes	Yes	Yes	Yes	Yes
Rate of Catch-up (%)	n.a	49	45.5	45.5	8.05	39.5
Years to Full Catch-up	n.a	4.08	4.39	4.39	24.8	5.06
<b>Panel B: Conditional Catch-up</b>						
Conditional Catch-up	No	Yes	Yes	Yes	No	No
Rate of Catch-up (%)	n.a	44.5	38.0	42.0	n.a	n.a
Years to Full Catch-up	n.a	4.49	5.26	4.76	n.a	n.a

Yes: Significant evidence of Catch-up. No: insignificant evidence of Catch-up. n.a: not applicable due to absence of significant catch-up.

**Table 3: Information criteria**

	Political Governance	Economic Governance	Institutional Governance	General Governance	Inflation	Unemployment
<b>Panel A: Absolute Catch-up</b>						
Initial (-1)	0.350 (0.212)	<b>0.98***</b> (0.000)	<b>0.91***</b> (0.000)	<b>0.91***</b> (0.000)	<b>0.161**</b> (0.033)	<b>0.79***</b> (0.000)
AR(2)	1.739*	<b>-1.254</b>	<b>0.879</b>	<b>-0.054</b>	<b>-1.536</b>	<b>0.844</b>
Sargan OIR	<b>13.517</b>	<b>13.266</b>	<b>13.723</b>	<b>12.965</b>	<b>10.229</b>	<b>3.968</b>
Wald (joint)	1.553	<b>700***</b>	<b>284***</b>	<b>269***</b>	<b>4.547**</b>	<b>1089***</b>
Countries	14	14	14	14	12	5
Observations	70	70	70	70	57	23
<b>Panel B: Conditional Catch-up</b>						
Initial(-1)	<b>0.49***</b> (0.000)	<b>0.89***</b> (0.000)	<b>0.76***</b> (0.000)	<b>0.84***</b> (0.000)	0.189 (0.201)	2.592 (0.146)
AR(2)	1.654*	<b>-1.457</b>	<b>0.186</b>	<b>-0.380</b>	<b>-1.815*</b>	<b>-1.273</b>
Sargan OIR	<b>4.115</b>	<b>6.304</b>	<b>5.979</b>	<b>8.553</b>	<b>7.494</b>	n.a
Wald (joint)	<b>71.08***</b>	<b>34559***</b>	<b>604***</b>	<b>679***</b>	<b>23.2***</b>	<b>652***</b>
Countries	14	14	14	14	12	5
Observations	65	65	65	65	54	23

\*, \*\*, \*\*\*: significance levels of 10%, 5% and 1% respectively. Initial (-1): Lagged dependent variable. AR(2): Second Order Autocorrelation test. OIR: Overidentifying Restrictions test. Z-statistics for AR(2) and Chi-square statistics for Sargan OIR and Wald (joint). The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(2) tests and; b) the validity of the instruments in the Sargan OIR test. P-values in brackets. The small number of countries in the last column is due to missing observations in the outcome variable. Though inconsistent, the corresponding estimates are expositional and do not significantly influence the broad findings.

In light of the above, from a projection date of 2007, the Arab Spring should occur between January 2011 and April 2012. In other words, in the latter interval, cross-country differences in signals that could spark revolutions are inexistent, such that a social unrest in one country due to the underlying signals can spread to other nations without distinction of



locality or nationality. Under these conditions, the possibility of revolts is harmonized completely across countries. This inference is in accordance with the recent bulk of catch-up literature on IPR harmonization against software piracy (Andrés & Asongu, 2013; Asongu, 2013a), *inter alia*.

On cautions and caveats, four points are worth noting. First, findings of conditional catch-up are contingent on the variable we choose and empirically test. Hence, the conditioning information set may not reflect all determinants of signals in cross-country revolutions. Therefore, using alternative variables is not likely to produce different results. Nonetheless, the consistency of absolute and conditional catch-up results inherently demonstrates less misspecification in the conditioning information set. Moreover, the findings are also contingent on the year of forecast because we are unlikely find the same results if 2008 or 2009 became the year of forecast.

Second, signaling is crucial for a good appreciation of the dependent variables, since the occurrences of revolutions and social unrests are most likely with negative information. Whereas inflation in consumer prices and rising unemployment represent negative signal indicators, governance variables may be seen to reflect positive signals. This does not represent a major concern for the empirics because governance indicators are skewed to the left.

Third, critics of the *beta*-convergence approach have emphasized two main shortcomings that could render the catch-up hypothesis unfeasible: (1) differences in initial endowments on or conditions in the signals of social unrests, such that movement of the dispersion is contingent on the initial distribution of the variables and; (2) the possibility of multiple equilibria that negates the hypotheses of long-run convergence towards the same path.

Last, the employment of econometrics to accomplish beyond testing the validity of existing theories has its own shortcomings. While the intuition ground of this paper has been



solidly justified by the substantial bulk of a recent strand of studies in the convergence literature, it is no less true that theories could originate from consistent empirics.

#### **4. Conclusion**

This paper contributes to the rising scholarly debates about whether the Arab Spring came as a spontaneous phenomenon or could have been predicted by social sciences with almost mathematical precision. It has practically answered the key concerns on whether politico-economic trends were common in the MENA countries prior to the Arab Spring. We have modeled core demands for better governance, less consumer price inflation and more employment using a methodological innovation on the complete elimination of cross-country dispersion in potential signals of social revolts. The empirical evidence based on 14 MENA countries shows that the Arab Spring was predictable in 2007 to occur between January 2011 and April 2012. While the findings predict the wave of cross-country revolutions with almost mathematical precision, caveats and cautions have been discussed for the scholar to understand the expositional dimensions of the empirics.



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