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Quality of Growth Empirics: Comparative Gaps, Benchmarking and Policy Syndromes

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Abstract

This study uses a new dataset to provide comparative gaps, benchmarking with best performers and policy syndromes of growth quality in 93 developing countries with data for the period 1990-2011. Sigma and Beta estimation strategies are used to provide between and within cross-country dispersions. The empirical evidence is based on: time, regions, income levels, resource-wealth, state fragility and time-consistent growth quality (GQ) performance. *First*, for 'within dispersions' the following outcomes are established: (1) GQ dispersions within fundamental characteristics have been decreasing over time, (2) From a time-dynamic view, countries within Asia and the Pacific have experienced the highest reduction in GQ differences while nations in the Middle East and North Africa (Central and Eastern European) region have witnessed the highest (lowest) differences, (3) From an income perspective, upper-middle-income (Low-income) countries have the lowest (highest) differences in GQ. (4) Resource-rich and Non-fragile countries have higher differences relative to their Resource-poor and Fragile counterparts respectively. Second, for 'between dispersions' and policy syndromes, we found two time-consistent extremities. (1) In decreasing need of policy intervention, the following are apparent for the Policy syndrome extreme: Hopeful, Fragile, Sub-Saharan African, Low-income and Resource-rich countries. (2) In the same line of policy inference, the following are apparent for the Syndrome-free extreme: Central and Eastern European, Asia and the Pacific, Latin American, Best Performing and Upper-middle-income countries. Their predispositions are clarified and policy implications discussed.

JEL Classification: O40; O57; I10; I20; I32
Keywords: Quality of growth; Development; Catch-up.

1. Introduction

"*Output may be growing, and yet the mass of the people may be becoming poorer*" (Lewis, 1955). With growing evidence of "immiserizing growth" (Bhagwati, 1958)[1], there is some consensus in the inclusive growth literature on the crucial role of *inequality in poverty-growth transformations* (Adams, 2004; Kalwij & Verschoor, 2007; Fosu, 2011, 2015; Thorbecke, 2013). Accordingly, the narratives are broadly consistent with the need for policy to critically employ growth elasticity instruments (Adam, 2004). These include, inter alia: the role of income distribution in poverty mitigation (Ali & Thorbecke, 2000; Datt & Ravallion, 1992; Kakwani, 1993) and the relevance of inequality in the responses of poverty to growth (Fosu, 2015; Easterly, 2000; Ravallion, 1997; Asongu & Kodila-Tedika, 2017; Asongu, 2016).

Studies substantiating the above narratives range from African nations (Fosu, 2008, 2009, 2010a, 2010b) to broader samples of developing economies (Fosu, 2010c). These studies are in accordance with Lewis (1955) on the imperative for policy to emphasise inequality rather than growth in the fight against poverty: "*The study finds that the responsiveness of poverty to income is a decreasing function of inequality*" (Fosu, 2010b, p. 818); "*The responsiveness of poverty to income is a decreasing function of inequality, and the inequality elasticity of poverty is actually larger than the income elasticity of poverty*" (Fosu, 2010c, p. 1432), and "*In general, high initial levels of inequality limit the effectiveness of growth in reducing poverty while growing inequality increases poverty directly for a given level of growth*" (Fosu, 2011, p. 11).

If we take a minimalistic view that growth enhances processes of industrialisation, then the conjectures of Fosu converge with Piketty's celebrated 'Capital in the 21st century'

[1] Substantial negative externalities could accompany economic growth. Hence, improvements in production possibilities could also lead to disequalizing income distribution. This tendency contradicts Kuznets' (1955, 1971) conjectures on an inverted-U shape nexus between industrialisation and inequality. There is considerable evidence with which to debunk Kuznets' theories in developing countries (Asongu, 2016).

(Piketty, 2014) on the need for policy to focus more on inequality reduction in charting the course of industrialisation (Asongu & Kodila-Tedika, 2017; Kodila-Tedika et al., 2016). This convergence is also consistent with a growing body of literature on achieving post-2015 objectives of inclusive and sustainable development (Ozgur et al., 2013; Timmons et al., 2009; Monika & Bobbin, 2012; Bagnara, 2012; Miller, 2014; Singh, 2014).

In response to these growing narratives, a recent International Monetary Fund (IMF) publication has proposed a Quality of Growth Index (QGI)[2]. Accordingly, the Mlachila et al. (2014) index for developing countries encompasses both the social dimensions and the intrinsic nature of growth. This interesting study leaves room for improvement in at least three main areas. *First*, the paper concludes that the convergence rate among developing nations is relatively slow. Indeed as documented by recent catch-up literature, convergence among a very heterogeneous set of countries is unlikely to occur (Narayan, 2011, p. 2773; Islam, 1995; Asongu, 2013a, p. 46). *Second*, in the same line of thought, the quality of growth (hence QG) determinants presented in Table 3) may vary across non-homogenous panels. Hence, blanket policies may not be appropriate unless they are contingent with fundamental characteristics of QG. *Third,* while the underlying study[3] presents the state of QG in developing countries, policy recommendations often revolve around more interesting insights like gaps in QG for policy syndromes so that countries with the highest gaps or dispersions relative to the benchmarks (or best performers) are entitled to receive more attention.

The present paper aims to fill the above gaps by using fundamental characteristics documented in the underlying study to address the three issues identified above[4]. The deep concerns that matter to us in tackling the issues arise from four practical questions. (1) Are determinants of growth quality (GQ) different across central characteristics of advancement in

[2] See September 16th 2014 IMF publication: http://www.imf.org/external/pubs/cat/longres.aspx?sk=41922.0
[3] We shall use the term 'underlying study' with Mlachila et al (2014) interchangeably throughout the paper.
[4] The fundamental characteristics or homogenous panels documented in Figures 2-3 and Figure 4.

developing countries? (2) What are the convergence and catch-up dynamics in GQ *within* fundamental panels? (3) What are the gaps *between* fundamental panels when benchmarked with best performers? (4) What are the resulting policy syndromes?

To be sure, answers to the above questions contribute to bridging the identified gaps in at least three main ways. *First*, using comparative determinants based on five criteria which represent seventeen fundamental characteristics, we are able to complement the issue of heterogeneity in determinants which is shown in Table 3. *Second,* more evidence on the convergence hypothesis complements the slim indication of catch-up provided in Table 2 of the underpinning study. *Third*, for an in depth assessment, GQ gaps are examined with the more robust methodology of convergence and benchmarks which are used to identify policy syndromes.

While the last-three contributions above stand-out boldly, some criticisms might arise on the robustness of the first contribution. Accordingly, in this underlying paper determinants of GQ have been documented with regard to some fundamental characteristics (Appendix 9). We improve the comparative determinants in at least three ways: *First*, involving 'aggregate institutional quality', 'rule of law' and corruption-control in the same specification results in multicollinearity and overparameterization issues that could substantially bias estimated coefficients. *Second,* we decompose the social spending variable into its health and educational components to provide more policy options. *Third,* while the underlying study provides seven comparative sub-panels, we extend them to seventeen. Accordingly, limiting the comparison to only one dimension of some criteria may not be exhaustive enough for policy. Moreover, we add some documented but unexploited homogenous characteristics of Quality of Growth Index (QGI) performance: Hopefuls, Contenders and Best Performers.

The richness of the dataset has enabled us to disaggregate the information into five fundamental characteristics. These are based on: non-overlapping intervals (1990-1994; 1995-

1999; 2000-2004 & 2005-2011); regions (Sub-Saharan Africa (SSA), Middle East and North Africa (MENA), Asia and the Pacific (AP), Central and Eastern Europe (CEE) and Latin America (LA)); income levels (Low-income (LIC), Middle-income (MIC), Lower-middle-income (LMIC) and Upper-middle-income (UMIC); resource-wealth (Resource-rich (RR), Resource-poor (RP)); State fragility (Fragile (Frag) and Non-Fragile (Non-Fragile) countries) and GQ performance over time (Hopefuls [Hope]), Contenders [Cont]) and Best performers [Best]).

This analytical procedure entails two main steps. *First*, the catch-up and convergence patterns are investigated using *beta* and *sigma* methodologies for panel and cross-sectional specifications respectively[5]. Both the absolute and conditional versions of *beta* convergence are provided. *Second*, benchmarking and 'further identification of gaps' are used to provide the policy syndromes which are much needed for heterogeneous policy initiatives.

As to the anxiety that may arise on the publication status of the paper motivating this inquiry, justifications are presented in Section 2. We understand this study may contravene some scientific orthodoxy because it is not positioned as an extension of a paper published in a journal. The concerns that matter to us are the practical questions and gaps in the literature discussed above. To these ends, we aim to exploit a new database, freshly available to the scientific community in order to provide policy implications on some important, urgent and pressing issues.

The rest of the study is organized as follows. Section 2 briefly presents concepts and measurements of pro-poor growth and intuitions for the empirics. The data and methodology are discussed in Section 3. Section 4 presents the empirical analysis and discusses the results. Concluding implications and further research directions are covered in Section 5.

[5] While it is more technically correct to refer to 'beta catch-up' and 'sigma convergence' because the former is a condition for the latter, we shall use 'beta and "sigma" convergence' interchangeably throughout the paper.

2. Concepts of pro-poor growth and intuition for the empirics

As discussed in the introductory section, there has been a growing strand in the literature on rising inequality as a challenge to 21st century capitalism (Brada & Bah, 2014) and its implications for global economic prosperity (IMF, 2007) and social order (Milanovic, 2010). Two important dimensions in this stream of research have been the measurements and determinants of inclusive growth (Anand et al., 2013). Anand et al. (2013) have proposed an indicator of inclusive growth which captures both the distribution and pace of economic growth. Motivated by the intuition that for growth to mitigate poverty in a sustainable manner it has to be inclusive (Kraay, 2004; Berg et al., 2011ab), they have provided a measurement of economic growth adjusted for inequality. In principle, they rely on the Ianchovichina and Gable (2011) conception of inclusive growth and a definition of inclusiveness that entails employment transitions, market protection, equity and equal opportunities. The adopted concept of inclusive growth consists of increasing growth and expanding the economy through level playing grounds for employment, growing investment and productivity. The measurement provided is consistent with the absolute pro-poor definition of inclusive growth, which sustains that growth is inclusive in so far as the poor benefit from it in absolute terms (Ravallion & Chen, 2003). The authors have argued that relative pro-poor growth which mitigates inequality by benefiting the poor more (Dollar & Kraay, 2002) may engender suboptimal consequences for majority households (poor & non-poor).

Mlachila et al. (2014) have reconciled the concept, definition and measurement of pro-poor growth by: the Commission on Growth and Development (2008), Ianchovichina and Gable (2012) and Anand et al. (2013) respectively into a new indicator of 'quality of growth'. According to the authors, this common denominator of pro-poor growth is all-encompassing in the perspective of growth that is socially friendly, durable and high: "good quality growth". The indicator which derives from Martinez and Mlachila (2013) on the quality of high-growth

in sub-Saharan Africa argues that high growth in many countries over the past decades has not been accompanied with substantial mitigation of unemployment, inequality and poverty (Dollar & Kraay, 2002; Dollar et al., 2013). Hence certain characteristics are needed for growth to be of quality, inter alia: stability, strength, sustainability, growing productivity and socially appealing results like poverty mitigation and higher living standards. Therefore, this study adopts the Mlachila et al. (2014) QGI in the empirics because it combines the intrinsic nature of growth with its social dimensions.

The foundation for these empirics is also consistent with a growing body of literature which has been motivated by the intuition that applied econometrics should not be limited to mere acceptance or refutation of existing theories and practices (Constantini & Lupi, 2005, p. 2; Narayan et al., 2011, p. 2772 ; Asongu, 2014a, p. 336).

We are very aware of the risks of performing measurements on unpublished papers. However we argue that applied econometrics should not be exclusively limited to the extension of published papers. We postulate that extending unpublished papers is also a useful scientific activity. Therefore, the study steers clear of a mainstream informal consensus which suggests that only inquiries positioned on extending published papers are most likely to be published in reputable scientific media[6]. Hence, this empirical exercise also doubles in tackling the highlighted issue of publication bias.

There are at last three other logical justifications for extending the underlying study: reputation of publication medium, nearness to deadline of the MDGs and characteristics of published data. *First,* the IMF Working Paper Series is peer-reviewed. Hence, the published working paper could also be construed as a published journal article. *Second,* nearness to the MDGs deadline implies that researchers cannot afford to wait for the motivating paper to be published in a journal before exploiting the underlying data to provide policy implications

[6] This is a postulate by the authors.

relevant for the post-2015 agenda on sustainable development. *Third*, some published data by international multilateral institutions may not be forwarded for further publication in mainstream journals because they are primarily meant for internal use. Hence, it is only scientifically correct for external researchers to use the available data in further assessing internal findings that are fundamentally used for wide (or global) policy initiatives.

While most empirical papers published in top tier journals are fundamentally based on extending previously published papers, our perspective on this line of inquiry is simply to follow and understand. Theoretically, the present scientific inquiry further highlights the relevance of a crucial policy issue: inclusive human development. By this assertion we do not undermine the value of published papers. Our predominant preoccupation is that applied econometrics should be given a broader scope and not restricted to published papers which may sometimes be characterized with errors.

Accordingly, mainstream consensus should not limit empirics to merely refuting/confirming the conclusions of previously published papers. Some published papers may be too vaguely positioned for practical assessment (Granger, 1999). Empirics in econometrics should have more practical goals (Franses, 2002). The assessed results from published papers may not necessarily be the most interesting (Summers, 1991, p. 129). Moreover, there could even be disturbing incidences when published papers conceal observations from the scientific community (Constantini & Lupi, 2005).

In light of above reasons, we do not position the current inquiry as a direct extension of a published paper. Instead, we aim to exploit new database, freshly available to the scientific community in assessing some important, urgent and pressing issues. The deep concerns that matter to us are the practical questions highlighted in the introduction. The positioning of the inquiry steers clear of recent policy studies on inclusive human development literature which have focused on, *inter alia*: employment protection and wage

inequality (Perugini & Pompei, 2016); perspectives on inclusive and sustainable development in emerging markets (Stiglitz, 2016); economic inequality and optimal redistribution through taxation (Yunker, 2016); the relationship between poverty and deprivation (Renuka & Viet-Ngu, 2016); the redistributive effect of regulation in developing countries (Atsu & Adams, 2015); gender equality (Baliamoune-Lutz & McGillivray, 2009; Anyanwu, 2013a; Elu & Loubert, 2013; Baliamoune-Lutz, 2007; Anyanwu, 2014a), rural-urban inequality (Baliamoune-Lutz & Lutz, 2005), poverty relationships (Anyanwu, 2013b, 2014b), nexuses between finance, growth, employment and poverty (Odhiambo, 2009, 2011), the relevance of financial development in poverty reduction (Odhiambo, 2010a, 2010b, 2013) and linkages between human development, information technology and mobile banking in inclusive development (Asongu & Nwachukwu, 2017; Asongu & Le Roux, 2017).

3. Data and Methodology

3.1 Data and fundamental characteristics

We assess a sample of ninety-three developing countries for the period 1990-2011 with data from Mlachila et al (2014)[7]. The data consists of non-overlapping interval averages: 1990-1994; 1995-1999; 2000-2004 & 2005-2011[8] The variables defined include: the Quality of Growth Index (dependent variable), education spending, health spending, government stability, inflation, private domestic credit, foreign direct investment (FDI), remittances, foreign aid, rule of law and quality of bureaucracy. As emphasized in the motivation of this paper, there are two differences in the choice of variables with respect to the underlying study: (1) we decompose the social spending indicator into its health and educational

[7] The authors obtain their variables from various sources, inter alia: the IMF, World Economic Outlook database, COMTRADE, Xala-i-Martin (2006), Barro & Lee (2010) & the World Bank Development Indicators.
[8] The Mlachila et al (2014) dataset has been recently employed in the development literature, notably; in: assessing inclusive development throughout the conditional distribution of inclusive development (Asongu & Nwachukwu, 2016a), investigating the relationship between mobile banking and inclusive development (Asongu & Nwachukwu, 2017) and examining the role of trust in quality of growth (Asongu & Gupta, 2016).

components and (2) we do not include two variables (*aggregate institutional quality* and *corruption-control*) because of their potentially high correlation with the *rule of law* indicator.

The independent variables of interest which are broadly consistent with Anand et al (2013, p. 16) are expected to have positive effects on the dependent variable for the most part. Discussing the expected signs to elaborate detail could be construed as a repetition of the underlying study and also Anand et al (2013). Justifications provided by these authors for the variables build on an interesting stream of pro-poor growth literature (Anand et al., 2012; IMF, 2007; Barro & Lee, 2000; Dollar & Kraay, 2003; Hausmann, et al., 2007; Mishra, et al., 2011; Calderon & Servén, 2004; Levine, 2005; Seneviratne & Sun, 2013)[9]. Full definition of the variables, summary statistics, correlation matrix and categorization of countries are presented in Appendix 1, Appendix 2, Appendix 3 and Appendix 4 respectively. The summary statistics of the variables show that indicators are comparable and have high degrees of variations. Hence, we can be confident that significant connections would emerge.

The categorization of countries is based on five criteria from the underlying study which represents seventeen fundamental characteristics. This enables us to complement the issue of heterogeneity in determinants which are articulated in Table 3 The vital features or homogenous panels are retrieved from Figures 2-3 and Figure 4 of the underlying study. These include: non-overlapping intervals (1990-1994; 1995-1999; 2000-2004 & 2005-2011); regions (Sub-Saharan Africa (SSA), Middle East & North Africa (MENA), Asia & the Pacific (AP), Central & Eastern Europe (CEE) and Latin America (LA)); income levels (Low-income (LIC), Middle-income (MIC), Lower-middle-income (LMIC) and Upper-middle-income (UMIC); resource-wealth (Resource-rich [RR]), Resource-poor [RP]); State fragility (Fragile

[9] Consistent with Anand et al. (2013) and the IMF (2007), structural change, human capital and macroeconomic stability are crucial drivers of pro-poor growth in developing countries. Structural change includes globalisation, FDI and trade openness while the other two constitute documented determinants in the convergence literature like technological change, fixed investment and educational levels. Other structural factors and macroeconomic fundamentals include moderate output volatility and inflation (Barro & Lee, 2000; Dollar & Kraay, 2003), general financial development (Levine, 2005), moving-up the commodity value chain (Anand, et al., 2012; Hausmann et al., 2007), modernization of manufacturing (Mishra et al., 2011) and improvement of infrastructural quality (Calderon & Servén, 2004; Seneviratne & Sun, 2013).

[Frag] and Non-Fragile (Non-Fragile) countries) and GQ performance (Hopefuls [Hope]), Contenders [Cont] and Best performers [Best]).

3.2 Methodology

As highlighted in the introduction, the analytical procedure here entails two main steps.

First, the catch-up and convergence patterns are investigated using *beta* and *sigma* methodologies for panel and cross-sectional specifications respectively. Both the absolute and conditional versions of *beta* convergence are provided. Due to some inherent issues in the computation of catch-up dynamics[10], we complement the *beta convergence* GMM approach with a less criticised estimation technique of *sigma convergence*[11]. The latter procedure for identifying gaps is consistent with two dimensions of the title: 'benchmarking and policy syndromes'.

Second, benchmarking and 'identification of gaps' are used to provide the policy syndromes much needed for heterogeneous policy initiatives. The procedure consists of first identifying fundamental characteristics with the best QGI across non-overlapping intervals. Then, assessing QGI gaps between the benchmark and sub-panels (for all non-overlapping intervals). *Finally*, the high identified gaps represent the great policy syndromes requiring more policy attention.

The following are steps in the estimation process.

Step 1: *Beta* catch-up

[10] The four non-overlapping intervals (NOIs) used by authors of the underling study (Mlachila et al., 2014, p. 13) are non homogenous, notably: 1990-1994; 1995-1999; 2000-2004 & 2005-2011. While the NOI in the first-three ranges is five, the last range has a seven-year NOI. Hence, using the proposed GMM empirical strategy to provide fresh patterns (convergence rates/half lives, time to full convergence…etc) appears difficult because the coefficient of autoregression (τ) is not constant.

[11] The advantages of *sigma* convergence over *beta* catch-up have been substantially documented. For instance, the latter has more caveats due to issues of initial endowments and multiple equilibria (Asongu, 2014a; Monfort, 2008, p. 4-5; Asongu, 2015a, p. 20).

According to Fung (2009), Eqs (1) and (2) are standard techniques for estimation *beta* convergence.

$$\ln(QGI_{i,t}) - \ln(QGI_{i,t-\tau}) = \alpha + \beta \ln(QGI_{i,t-\tau}) + \sum_{h=1}^{10} \delta_j W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \qquad (1)$$

$$\ln(QGI_{i,t}) = \alpha + \delta \ln(QGI_{i,t-\tau}) + \sum_{h=1}^{10} \delta_j W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \qquad (2)$$

Where: $QGI_{i,t}$ is the Quality of Growth index for country i at period t; α is a constant, W is the vector of determinants, ξ_t is the time-specific effect and $\varepsilon_{i,t}$ the error term. Accordingly, $\delta = \beta + 1$ and, conditions for convergence are $\beta < 0$ in Eq. (1) and $0 < |\delta| < 1$ in Eq. (2). However W_t which needs to exhibit strict exogeneity for convergence to take place is endogenous[12]. We use the procedure suggested by Arellano & Bond (1991) in exploiting all orthogonality conditions between the lagged QGI indicators and the error terms. We prefer the *System* to the *Difference* estimator (Bond et al., 2001, pp. 3-4) and specify it as a *two-step* (instead of *one-step*) procedure because it is consistent with heteroscedasticity (homoscedasticity). The estimation procedure combines Eq (2) above with Eq. (3) below which is in first-difference terms.

$$\ln(QGI_{i,t}) - \ln(QGI_{i,t-\tau}) = \alpha + \partial(\ln(QGI_{i,t-\tau}) - \ln(QGI_{i,t-2\tau})) + \sum_{h=1}^{10} \delta_j (W_{h,i,t-\tau} - W_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + \varepsilon_{i,t-\tau} \qquad (3)$$

Absolute or unconditional convergence is estimated with only the lagged endogenous variable as exogenous indicator while conditional convergence is specified including the vector W as exogenous variables.

Step 2: Sigma or cross-sectional convergence (Panel A of Table 3)

[12] The Hausman test for endogeneity can be provided upon request to the authors.

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(QGI_i - \mu)^2} \qquad (4)$$

where $\mu = \frac{1}{N}\sum_{i=1}^{N} QGI_i$

The procedure for estimating *sigma* convergence denoted by Eq (4) consists of observing the evolution in standard deviations of non-overlapping intervals across time. A decreasing tendency implies convergence.

4. Empirical Results: Catch-up and Convergence in the Quality of Growth

Tables 1 and 2 below present results for absolute and conditional catch-up based on Eqs (2) and (3). The underlying study has reported catch-up betas (β) of -0.066 and -0.068 for the full sample to confirm evidence of convergence. We have reported the lagged endogenous estimates (δ) without any transformation[13]. Hence, since, $\delta = \beta + 1$ and conditions for convergence are $\beta < 0$ or $0 < |\delta| < 1$, our results in Tables 1 and 2 are broadly consistent with the findings of the underlying study[14]. It is important to note however that the convergence patterns are heterogeneous across fundamental characteristics. This is the case for both absolute (Table 1) and conditional (Table 2) convergence dynamics.

There are four major shortcomings that limit our reliance on the *beta* convergence results for policy recommendations. *First*, we are unable to report the AR(2) test for the absence of autocorrelation and estimation beyond a one lag structure renders the matrices 'not positive definite' due to issues in degrees of freedom. *Second*, the issues in degrees of freedom are further confirmed because some of the conditional estimations are not feasible when all the conditioning information set (or control variables) are considered. *Third*, we

[13] Accordingly, δ could also be directly reported (Prochniak & Witkowski, 2012a, p. 20; Prochniak & Witkowski, 2012b, p. 23).

[14] While the absolute convergence findings of the full sample are broadly consistent, differences in the findings of conditional convergence may be traceable to the conditioning information set (or control variables) which is (are) not disclosed by the underlying study.

contacted the IMF to get raw data on which the QGI is based, but we were told that due to issues in degrees of freedom, the dataset that is publicly available is only based on non-overlapping intervals[15]. *Fourth*, we have also seen above that *beta* convergence has shortcomings relative to the *sigma* convergence approach. Moreover, the computations of policy syndromes are consistent with the latter approach. Though our policy implications substantially draw from the *sigma* convergence results, we have nonetheless reported the *beta* convergence findings to unlock the file drawer problem and tackle issues of publication bias in social sciences: of strong results against null results (Franco et al., 1991; Rosenberg, 2005). The focus on sigma convergence for policy implications is consistent with Asongu (2017a, 2017b) who has also preferred the sigma to the beta approach.

[15] We can provide correspondence e-mails upon request.

Table 1: Absolute convergence (Panel). Dependent variable: logQGI

	Regions					Income Levels				Resources		Fragility		Performances			Full
	SSA	**MENA**	**AP**	**CEE**	**LA**	**LIC**	**MIC**	**LMIC**	**UMIC**	**RR**	**RP**	**Frag**	**NFrag**	**Hope**	**Cont**	**Best**	**Sample**
Initial	**0.788*** **	**0.86*** **	**0.707*** **	**-0.042**	**0.618** **	**0.702*** **	**0.62** **	**0.773*** **	**0.621*** **	**0.774*** **	**0.865*** **	**0.901*** **	**0.896*** **	**0.718*** **	**0.923*** **	**0.470*** **	**0.897*** **
	(0.001)	**(0.000)**	**(0.000)**	**(0.968)**	**(0.012)**	**(0.001)**	**(0.022)**	**(0.000)**	**(0.062)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	**-1.070**	**0.465**	**-1.731**	**-0.245**	**-1.121**	**-0.866**	-1.672*	**-1.611**	**-1.550**	**-1.110**	**-1.010**	**-0.506**	-1.684*	**-1.120**	**-0.664**	-1.925*	**-1.540**
	(0.284)	**(0.641)**	**(0.083)**	**(0.806)**	**(0.262)**	**(0.386)**	(0.094)	**(0.107)**	**(0.121)**	**(0.266)**	**(0.312)**	**(0.612)**	(0.092)	**(0.262)**	**(0.506)**	(0.054)	**(0.123)**
AR(2)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Sargan	**6.606**	**5.387**	**2.334**	9.645**	**5.033**	**5.526**	9.844**	**4.603**	**6.364**	**2.489**	12.306**	**5.074**	**5.177**	**4.998**	**2.561**	31.55***	9.530**
	(0.158)	**(0.249)**	**(0.674)**	(0.046)	**(0.283)**	**(0.237)**	(0.043)	**(0.330)**	**(0.173)**	**(0.646)**	(0.015)	**(0.279)**	**(0.269)**	**(0.287)**	**(0.633)**	(0.000)	(0.049)
Wald	**10.86*** **	**81.36*** **	**91.76*** **	0.001	**6.228*** **	**9.765*** **	**5.247** **	**39.16*** **	**3.480***	**123.3*** **	**38.43*** **	**29.46*** **	**346.2*** **	**12.80*** **	**11.0*** **	**3.787***	**175.8*** **
	(0.001)	**(0.000)**	**(0.000)**	(0.968)	**(0.012)**	**(0.001)**	**(0.022)**	**(0.000)**	**(0.062)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.051)**	**(0.000)**
Instruments	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Countries	36	10	12	16	17	36	57	35	22	34	59	14	79	33	16	44	93
Observations	108	30	36	48	51	108	171	105	66	102	177	42	237	99	48	132	279

*,**,**: significance levels of 10%, 5% and 1% respectively. Initial: Lagged dependent variable. AR(1): First-order Autocorrelation test. AR(2): Second-order Autocorrelation test. Sargan: Sargan Overidentifying Restrictions (OIR) test. 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(1) tests and; b) the validity of the instruments in the Sargan OIR test. 90-94: 1990-1994. 95-99: 1995-1999. 00-04: 2000-2004. 05-11: 2005-2011. SSA: Sub-Saharan Africa. MENA: Middle East & North Africa. AP: Asia & Pacific. CEE: Central & Eastern Europe. LA: Latin America. LIC: Low Income. MIC: Middle Income. LMIC: Lower Middle Income. UMIC: Upper Middle Income. RR: Resource Rich. RP: Resource Poor. Frag: Fragile. NFrag: Non-Fragile. Hope: Hopefuls. Cont: Contenders. Best: Best Performers.

Table 2: Conditional convergence (Panel) Dependent variable: logQGI

	Regions					Income Levels				Resources		Fragility		Performances			Full
	SSA	**MENA**	**AP**	**CEE**	**LA**	**LIC**	**MIC**	**LMIC**	**UMIC**	**RR**	**RP**	**Frag**	**NFrag**	**Hope**	**Cont**	**Best**	**Sample**
Initial	**0.850****	n.sa	nsa	nsa	nsa	**0.832****	**1.242*****	**1.182*****	nsa	nsa	**0.938*****	nsa	**1.163*****	**0.520***	nsa	**0.827*****	**1.221*****
	(0.015)					**(0.018)**	**(0.000)**	**(0.000)**			**(0.000)**		**(0.000)**	**(0.095)**		**(0.000)**	**(0.000)**
Constant	0.073					0.037	0.371	0.482			0.024		0.396	-0.376		0.056	0.467
	(0.883)					(0.938)	(0.179)	(0.105)			(0.893)		(0.136)	(0.336)		(0.699)	(0.150)
Edu. Spending	0.015					0.011	0.014	0.018*			0.014		0.008	**0.032*****		0.0002	0.009
	(0.226)					(0.524)	(0.063)	(0.058)			(0.201)		(0.252)	**(0.000)**		(0.980)	(0.224)
Health Spending	**-0.033***					**-0.033***	-0.030	**-0.050****			**-0.024***		**-0.024*****	**-0.04*****		0.0006	**-0.025*****
	(0.056)					**(0.089)**	(0.136)	**(0.032)**			**(0.061)**		**(0.004)**	**(0.000)**		(0.948)	**(0.007)**
Govt. Stab	-0.020					-0.016	-0.010	**-0.018****			-0.008		-0.008	**-0.019***		0.004	-0.009
	(0.246)					(0.151)	(0.545)	**(0.028)**			(0.518)		(0.322)	**(0.052)**		(0.557)	(0.255)
Inflation(log)	0.034					-0.0001	-0.007	-0.020			0.020		0.0003	0.044		-0.001	-0.001
	(0.242)					(0.998)	(0.456)	(0.117)			(0.333)		(0.985)	(0.159)		(0.768)	(0.920)
Credit(log)	-0.051					-0.013	-0.022	-0.019			**-0.034***		**-0.048****	0.004		-0.032	**-0.056***
	(0.349)					(0.776)	(0.440)	(0.545)			**(0.054)**		**(0.036)**	(0.874)		(0.114)	**(0.059)**
FDI	-0.0007					-0.002	**0.010****	**0.010****			-0.0004		0.003	-0.003		0.001	0.004
	(0.920)					(0.708)	**(0.013)**	**(0.013)**			(0.928)		(0.250)	(0.621)		(0.580)	(0.207)
Remittances	-0.003					-0.010	0.003	0.006			0.004		0.001	0.006		0.0009	0.0007
	(0.668)					(0.423)	(0.409)	(0.059)			(0.216)		(0.508)	(0.412)		(0.423)	(0.756)
Foreign Aid	-0.007					-0.002	0.002	0.001			0.003		0.004	-0.005		**-0.005*****	0.005
	(0.283)					(0.790)	(0.725)	(0.530)			(0.405)		(0.374)	(0.387)		**(0.000)**	(0.356)
Rule of Law	**0.058****					0.035	-0.0008	-0.0005			**0.029****		**0.021***	0.015		0.005	**0.023***
	(0.046)					(0.341)	(0.948)	(0.943)			**(0.015)**		**(0.050)**	(0.416)		(0.497)	**(0.052)**
Bureaucracy	-0.022					0.002	-0.022	**-0.043****			-0.004		**-0.051****	0.038		-0.010	**-0.050****
	(0.632)					(0.941)	(0.456)	**(0.086)**			(0.718)		**(0.026)**	(0.351)		(0.502)	**(0.035)**
AR(1)	**-0.502**					**-0.370**	**-0.825**	**-0.759**			**-0.484**		**-0.455**	**-1.152**		**1.620**	**-0.167**
	(0.615)					**(0.710)**	**(0.409)**	**(0.447)**			**(0.628)**		**(0.649)**	**(0.249)**		**(0.105)**	**(0.867)**
AR(2)	na					na	na	na			na		na	na		na	na
Sargan	2.482					4.009	3.043	0.407			5.638		0.904	0.611		11.952**	1.429
	(0.647)					(0.404)	(0.550)	(0.981)			(0.227)		(0.923)	(0.961)		(0.017)	(0.839)
Wald	**459.8*****					**126.3*****	**536.3*****	**2970*****			**2661*****		**470.2*****	**964.7*****		**1203*****	**401*****
	(0.000)					**(0.000)**	**(0.000)**	**(0.000)**			**(0.000)**		**(0.000)**	**(0.000)**		**(0.000)**	**(0.000)**
Instruments	18					18	18	18			18		18	18		18	18
Countries	17					19	18	16			26		36	15		15	37
Observations	47					52	43	39			68		92	42		35	95

*,**,**: significance levels of 10%, 5% and 1% respectively. Initial: Lagged dependent variable. AR(1): First-order Autocorrelation test. AR(2): Second-order Autocorrelation test. Sargan: Sargan Overidentifying Restrictions (OIR) test. 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(1) tests and; b) the validity of the instruments in the Sargan OIR test. 90-94: 1990-1994. 95-99: 1995-1999. 00-04: 2000-2004. 05-11: 2005-2011. SSA: Sub-Saharan Africa. MENA: Middle East & North Africa. AP: Asia & Pacific. CEE: Central & Eastern Europe. LA: Latin America. LIC: Low Income. MIC: Middle Income. LMIC: Lower Middle Income. UMIC: Upper Middle Income. RR: Resource Rich. RP: Resource Poor. Frag: Fragile. NFrag: Non-Fragile. Hope: Hopefuls. Cont: Contenders. Best: Best Performers. Edu: Education. Gov't Stab: Government Stability. FDI: Foreign Direct Investment. HAC: Heteroscedasticity and Autocorrelation Consistent. n.sa: not specifically applicable due to shortage in degrees of freedom (matrix is not positive definite). Log: logarithm.

Table 3: Sigma convergence, benchmarking, gaps and policy syndromes

Panel A: Standard deviations (Dispersions within)

	Regions					Income Levels				Resources		Fragility		Performances			Full
	SSA	**MENA**	**AP**	**CEE**	**LA**	**LIC**	**MIC**	**LMIC**	**UMIC**	**RR**	**RP**	**Frag**	**NFrag**	**Hope**	**Cont**	**Best**	**Sample**
1990-1994	0.103	0.101	0.117	0.056	0.063	0.109	0.087	0.089	0.061	0.145	0.139	0.090	0.135	0.076	0.055	0.050	0.141
1995-1999	0.100	0.112	0.091	0.047	0.044	0.119	0.087	0.093	0.056	0.146	0.140	0.118	0.131	0.079	0.061	0.045	0.142
2000-2004	0.089	0.108	0.076	0.036	0.044	0.118	0.090	0.097	0.064	0.141	0.133	0.124	0.124	0.072	0.060	0.050	0.136
2005-2011	0.084	0.106	0.059	0.046	0.047	0.108	0.087	0.094	0.060	0.136	0.113	0.107	0.109	0.069	0.039	0.046	0.123

Panel B: Benchmarking QGI (Highest Performers): Means

	SSA	**MENA**	**AP**	**CEE**	**LA**	**LIC**	**MIC**	**LMIC**	**UMIC**	**RR**	**RP**	**Frag**	**NFrag**	**Hope**	**Cont**	**Best**	**Sample**
1990-1994	0.422	0.574	0.655	0.644	0.670	0.462	0.638	0.608	**0.686**	0.532	0.570	0.420	0.580	0.398	0.543	0.679	0.556
1995-1999	0.446	0.604	0.688	0.690	0.700	0.459	0.667	0.641	**0.709**	0.567	0.598	0.440	0.613	0.422	0.598	0.706	0.587
2000-2004	0.478	0.632	0.710	**0.738**	0.717	0.503	0.690	0.665	0.729	0.593	0.631	0.479	0.642	0.458	0.644	0.727	0.617
2005-2011	0.534	0.671	0.751	0.748	0.748	0.559	0.718	0.695	**0.754**	0.629	0.672	0.517	0.681	0.512	0.686	**0.754**	0.656

Panel C: Gaps with Highest Performers (Dispersions Between based on Standard deviation of Means)

	SSA	**MENA**	**AP**	**CEE**	**LA**	**LIC**	**MIC**	**LMIC**	**UMIC**	**RR**	**RP**	**Frag**	**NFrag**	**Hope**	**Cont**	**Best**	**Sample**
1990-1994	0.187	0.079	0.022	0.030	0.011	0.158	0.034	0.055	0.000	0.109	0.082	0.188	0.075	0.204	0.101	0.005	0.092
1995-1999	0.186	0.074	0.015	0.013	0.006	0.177	0.030	0.048	0.000	0.100	0.078	0.190	0.068	0.203	0.078	0.002	0.086
2000-2004	0.184	0.075	0.020	0.000	0.015	0.166	0.034	0.052	0.006	0.103	0.076	0.183	0.068	0.198	0.066	0.008	0.086
2005-2011	0.156	0.059	0.002	0.004	0.004	0.138	0.025	0.042	0.000	0.088	0.058	0.168	0.052	0.171	0.048	0.000	0.069

Panel D: Policy Syndromes

Policy Syndromes →																	**Syndrome Free**
1990-1994	Hope	Frag	SSA	LIC	RR	Cont	Sample	RP	MENA	NFrag	LMIC	MIC	CEE	AP	LA	Best	UMIC
1995-1999	Hope	Frag	SSA	LIC	RR	Sample	RP	Cont	MENA	NFrag	LMIC	MIC	AP	CEE	LA	Best	UMIC
2000-2004	Hope	SSA	Frag	LIC	RR	Sample	RP	MENA	NFrag	Cont	LMIC	MIC	AP	LA	Best	UMIC	CEE
2005-2011	Hope	Frag	SSA	LIC	RR	Sample	MENA	RP	NFrag	Cont	LMIC	MIC	CEE	LA	AP	UMIC	Best
Highest Dispersions (Gaps) →																	**Lowest Dispersions (Gaps)**

90-94: 1990-1994. 95-99: 1995-1999. 00-04: 2000-2004. 05-11: 2005-2011. SSA: Sub-Saharan Africa. MENA: Middle East & North Africa. AP: Asia & Pacific. CEE: Central & Eastern Europe. LA: Latin America. LIC: Low Income. MIC: Middle Income. LMIC: Lower Middle Income. UMIC: Upper Middle Income. RR: Resource Rich. RP: Resource Poor. Frag: Fragile. NFrag: Non-Fragile. Hope: Hopefuls. Cont: Contenders. Best: Best Performers. QGI: Quality of Growth Index. Bold numbers in Panel B denote benchmarks.

Table 3 presents the *sigma* convergence findings (Panel A). The benchmarking procedure based on means of fundamental characteristics for corresponding NOIs (Panel B). QGI gaps are computed as the difference between the highest performer (or benchmark) within a NOI and fundamental characteristics (Panel C). Policy syndromes depend on the degrees of dispersions or differences (Panel D)[16]. Figure 1 below presents the QGI dispersions based on regions, income levels, resource availability and state fragility and performance over time. The following are noticeable.

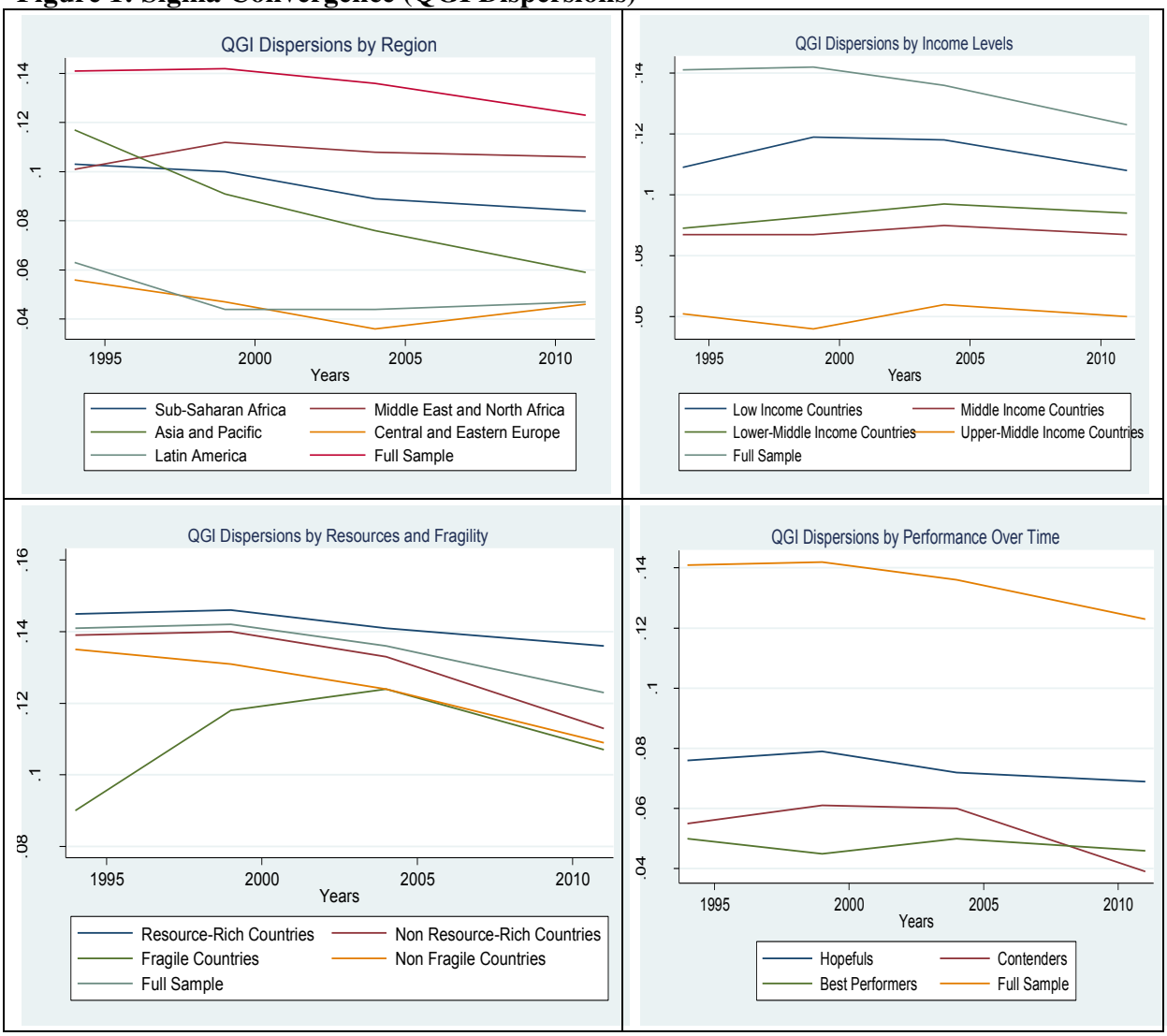
First, QGI dispersions within fundamental characteristics have been decreasing over time. The slight exception is Central and Eastern Europe (CEE) which has witnessed increasing differences in QGI distributions during the last periodic interval (2005-2011). *Second*, from a time-dynamic view, countries within the Asia and the Pacific (AP) have experienced the highest reduction in GQ differences while countries in the MENA (CEE) have witnessed the highest (lowest) differences, based on a regional assessment. *Third*, from an income perspective, Upper-middle-income (Low-income) countries have the lowest (highest) differences in QGI. *Fourth*, Resource-rich and Non-fragile countries have higher differences relative to their Resource-poor and Fragile counterparts respectively. *Fifth*, as expected, in the 'performance over-time' criterion, differences are highest in the Hopefuls and lowest in the Best Performers, with Contenders in the middle.

It should be noted that the above narratives are relevant for dispersions within fundamental characteristics. In order to ascertain the policy syndromes, we proceed to assessing dispersions between the fundamental features. This requires the benchmarking exercise (Panel B) in which the benchmark is the sub-panel with the highest GQI in terms of means for every NOI. 'Between dispersions'[17] in means are then employed to assess gaps

[16] Fosu (2013) from whom the term is borrowed has defined 'policy syndromes' as negative features to economic prosperity.
[17] 'Between dispersions' here implies differences between fundamental characteristics. The *beta* catch-up and *sigma* convergence dispersions have been 'within fundamental characteristics'.

with the benchmarks (Panel C). From this exercise, the dispersions are classified in decreasing order, with the highest representing the most critical/important policy syndromes (Panel D).

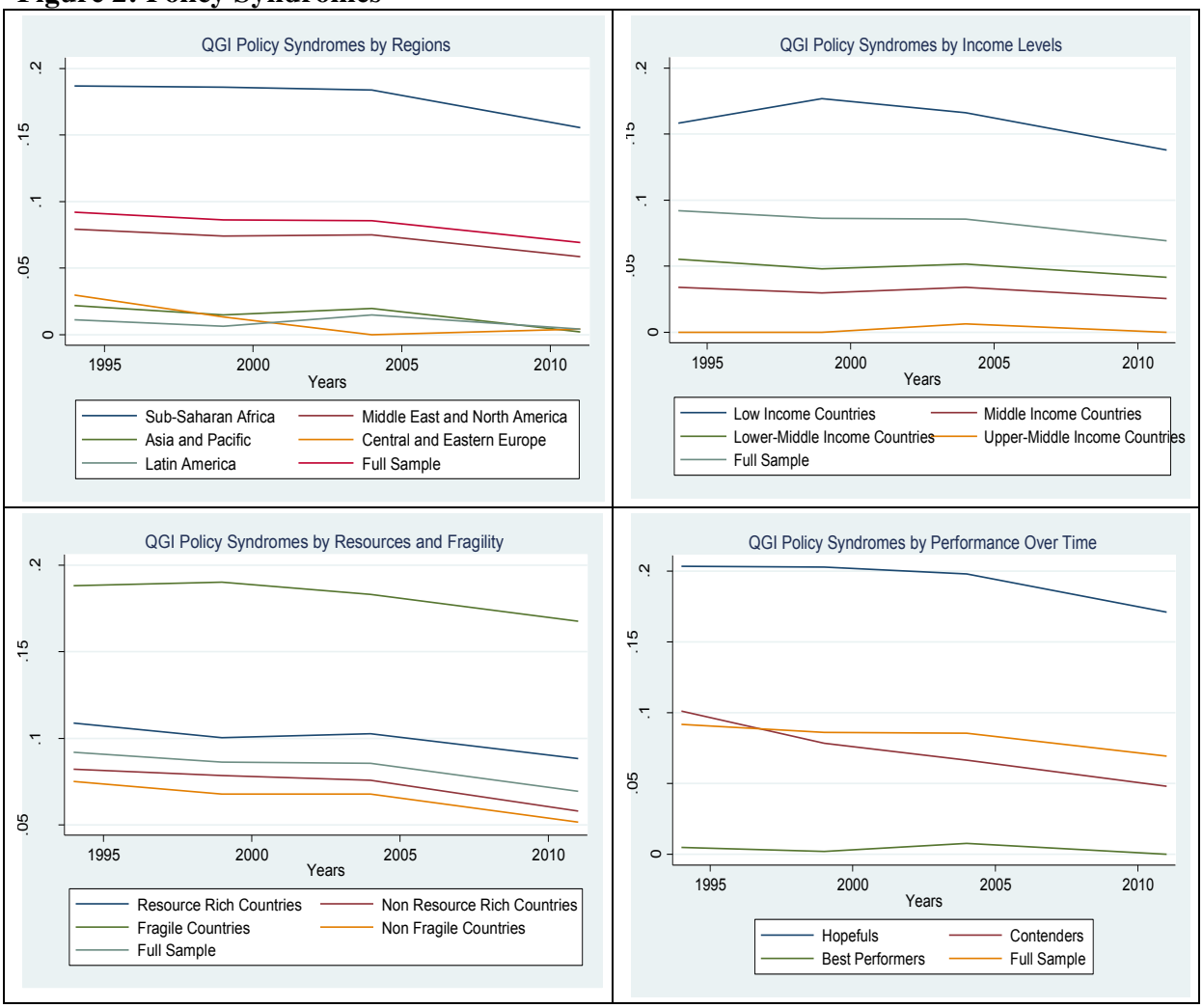
Figure 1: Sigma Convergence (QGI Dispersions)



The identified policy syndromes in terms of regions, income levels, resources & fragility and performance over time are illustrated in Figure 2 below. While the policy syndromes are not time-consistent, certain characteristics which are apparent from both extremities are broadly consistent over time (see Panel D). In decreasing need of policy intervention, the following are apparent for the policy syndrome extreme: Hopeful, Fragile, Sub-Saharan African, Low-income & Resource-rich countries. In the same line of inference, the following are apparent

for the Syndrome-free extreme: Central and Eastern European, Asia and the Pacific, Latin American, Best Performing and Upper-middle-income countries.

Figure 2: Policy Syndromes



5. Concluding implications

The above study has provided, within and between 'Quality of Growth Index' (QGI) dispersions with particular emphasis on the fundamental characteristics identified in Mlachila et al. (2014). The underlying study has left room for improvement in three main areas which we have identified and discussed in the introduction. The deep concerns that have mattered to us have been four practical question: (1) Are determinants of growth quality (GQ) different across fundamental characteristics of development in developing countries? (2) What are the

convergence and catch-up dynamics in GQ *within* fundamental panels? (3) What are the gaps *between* fundamental panels when benchmarked with best performers? (4) What are the resulting policy syndromes? *Beta* catch-up and *sigma* convergence techniques have been employed on data from ninety-three developing countries for the period 1990-2011.

For *within* dispersions that are based on *beta* and *sigma* findings, the following have been established. *First*, the QGI dispersions within fundamental characteristics have been decreasing over time. *Second*, from a time-dynamic view, countries within the Asia and the Pacific region have experienced the highest reduction in GQ differences while countries in the Middle East and North Africa: MENA (Central and Eastern Europe: CEE) have witnessed the highest (lowest) differences based on a regional assessment. *Third*, from an income perspective, Upper-middle-income (Low-income) countries have the lowest (highest) differences in the QGI. *Fourth*, Resource-rich and Non-fragile countries have higher differences relative to their Resource-poor and Fragile counterparts respectively.

Concerning *between* dispersions and policy syndromes, we have found that in decreasing need of policy intervention, the following are apparent for the policy syndrome extreme: Hopeful, Fragile, Sub-Saharan African, Low-income & Resource-rich countries. In the same line of policy inference, the following are apparent for the syndrome-free extreme: Central and Eastern European, Asia and the Pacific, Latin American, Best Performing and Upper-middle-income countries. These syndromes differ from those presented by the underlying study in at least three main ways. *First*, contrary to the static picture presented by the underlying study, our evidence is time-dynamic with more fundamental characteristics. *Second*, we have presented a broad comparative picture, as opposed to segmented perspectives with differing Full sample averages. *Third*, we devote space to discussing how the identified syndromes are reflected in the inclusive development literature in five main strands.

First, the evidence that Sub-Saharan Africa is a substantial policy syndrome in growth quality runs counter to recent narratives of the continent being on time for certain Millennium Development Poverty targets (Pinkivskiy & Sala-i-Martin, 2014). This is essentially because, other descriptions have sustained that growth miracle (Young, 2012) is being marred by burgeoning inequality (Blas, 2014) despite a growing middle class (Shimeles & Ncube, 2015; Ncube et al., 2011, 2014; Kodila-Tedika et al., 2016). It should be noted that immiserizing growth may entail a burgeoning middle-class that is accompanied by negative income-inequality externalities[18]. Despite evidence of a decline in African poverty relative to other regions in the World, the argument depends on periodicity: 1980-2010 versus 1995-2010 (Fosu, 2015). According to Fosu, only findings of the latter period (1995-2010) which have been characterised by growth resurgence substantiate the thesis of declining African poverty relative to other world regions. This inference is broadly consistent with Alan & Carlyn (2015) on African countries catching-up with the USA only after the mid-1990s. Hence, the periodicity of 1990-2011 used in this paper could partly elucidate these contrasting narratives. Moreover, the indicator used to measure extreme poverty also matters because while Pinkivskiy & Sala-i-Martin (2014) have measured extreme poverty as below $1 a day and have concluded that most African countries reached the MDG extreme poverty target, more contemporary literature suggests the contrary (Asongu & Nwachukwu, 2017).

Second, the policy syndrome of Resource-rich countries is substantially based on the mismanagement of resource wealth and capital flight. For instance, while growth in developing countries is substantially driven by Resource-rich countries, it is also characterised by very low social and health ratings. For example, consistent with Ndikumana & Boyce (2012), while the Republic of Congo, Gabon and Equatorial Guinea are among the

[18] The interested reader can refer to Moyo (2013) on why the Beijing model may not be a sustainable development model. This is essentially because, while it has delivered a burgeoning middle class within a record time, it has also done so at the price of rising inequality. This is consistent with the concluding implications of Asongu & Kodila-Tedika (2014).

wealthiest nations in Africa with per capita incomes of $1,253 (15th), $4,176 (5th) and $8,649 (2nd) respectively and massive reserves in oil (ranking, 10th [Equatorial Guinea]), 8th (Congo) and 7th [Gabon]), the majority of citizens in these countries are living in abject poverty. They lack access to decent sanitation and basic social services, health care, elementary schools and drinkable water. Equatorial Guinea and Gabon rank third and second to the last with 51 percent and 55 percent respectively in the rate of immunizing their population against measles. Moreover, a child born in Equatorial Guinea has odds against reaching a fifth birthday, which is higher than the sub-Saharan African average. A close look at the QGI rankings in the underlying paper (p. 27) confirms our stylized facts. A time-dynamic assessment of the performance of these countries for total of 93 developing nations from 1990-1994, 1995-1999, 2000-2004 & 2005-2011, reveals a substantial deterioration in rankings: Gabon (58th, 61st, 67th & 69th); Congo Republic (59th, 70th, 74th & 84th) and Equatorial Guinea (76th, 73rd, 76th & 88th).

Third, the findings on Fragile states and Low-income countries are consistent with intuition. While the former naturally reduces tax revenues and domestic investments, the latter is characterised by a lack of financial means needed for basic educational and social investments.

Fourth, the featuring of Latin American and Asia and the Pacific countries as quasi Syndrome-free, is consistent with the inclusive development literature (Young, 2012; Asongu, 2016; Fosu, 2015). Accordingly, economic growth between 1980 and 2010 has been accompanied by varying regional changes in poverty and inequality levels. Latin American and South East Asian nations have experienced slow growth and substantial inequality reduction, while MENA and Sub-Saharan Africa have experienced growing inequality.

Fifth, the position of High-income countries is broadly in line with the conclusions of Tebaldi and Mohan (2010). Since the quality of institutions has been established as driving

growth quality, the hypothesis that institutions may lead to growth quality (or poverty mitigation) through income-average as opposed to income-equality is broadly confirmed. This inference which is the object of debate may naturally constitute an interesting future line of inquiry. The Tebaldi and Mohan (2010) findings are currently subject to criticisms based on more holistic poverty indicators and evolving currents and debates from post-2010 literature (Asongu & Kodila-Tedika, 2017).

After identifying the policy syndromes, the natural question that arises is how policy can act on them to reduce cross-country differences in growth quality. But before we engage in how to address the identified policy syndromes, it is first of all worthwhile discussing why it is important for policy to act towards decreasing dispersions in growth quality. *First*, consistent with the underpinnings for cross-country common policy initiatives (Asongu, 2013b; Asongu, 2014b), decreasing differences in growth quality among countries implies that common policy initiatives among these states are feasible while complete elimination of cross-country differences suggests that such common initiatives can be applied without distinction of nationality. *Second*, the need for common policy initiatives substantially draws on the post-2015 development agenda which clearly articulates the need for harmonized growth quality (Anand et al., 2013; United Nations, 2013).

Addressing the policy syndromes would require, *inter alia*, tackling concerns associated with structural and institutional differences among countries that are inhibiting the convergence process. It would be out of scope to discuss all the determinants of Quality of Growth in detail because they have already been thoroughly covered in the literature discussed above (Mlachila et al., 2014; Anand et al., 2013). With this scope in mind, we have positioned the present inquiry essentially on: first, presenting *within* and *between* tendencies in growth quality dispersions and then identifying the resulting policy syndromes. The reader can explore literature on determinants of quality of growth in Section 2 of this paper. While

discussing determinants could be construed as a repetition of what Mlachila et al. (2014) have already documented, it would however be interesting to deal with the two negative determinants: inflation and foreign aid. We devote space to discussing these two because the underlying paper has provided no explanation on how these could be reinvented to promote growth quality.

First, how can we fight inflation to boost the quality of growth? The relevant literature argues that monetary and exchange rate policy responses were ineffective at addressing the 2008 food price inflation (Asongu, 2013c, p. 41). This is consistent with the narrative of the Director General of the International Food Policy Research Institute (Von Braum, 2008). Hence, national food security strategies are essential because globalization and current policies of trade are substantially undermining livelihoods (Asongu & Nguena, 2015; Osabuohien, 2014). An interesting literature on how to address food policy issues resulting from foreign land acquisitions has been documented by Osabuohien (2015).

Second, foreign aid could contribute to inclusive growth by orientating less developed countries towards industrialization not in the perspective of Kuznets (1955), but in the view of Piketty (2014). Hence, by focusing more on inequality instead of GDP growth, the negative effect of foreign aid on growth quality would become positive. This intuition is fundamentally based on the findings of Fosu discussed in the introduction: the effect of growth on poverty is a decreasing function of inequality because the inequality elasticity of poverty is higher than the growth elasticity of poverty[19].

On policy lessons that peripheral countries in terms of quality of growth can learn from frontier countries, two facts are apparent from the QGI classifications. On the one hand, China was on average the best performing frontier country during the period 2004 to 2011. On the other hand, Chad and the Central African Republic are the worst performing countries

[19] The reader can have brief insights into the economics of foreign aid for inclusive human development in Asongu (2014c).

for the same period and, by extension, most bottom performing countries are in Sub-Saharan Africa. Two resulting important questions are relevant for policy: are the QGI performance measures from Mlachila et al (2014) consistent with recent literature based on data closer to our time and what are the lessons of China to Sub-Saharan African countries?

With regard to the first question, the statistics from the Mlachila et al. (2014) are consistent with more contemporary literature because a recent World Bank report on the MDG extreme poverty target has revealed that extreme poverty has been decreasing in all regions of the world with the exception of Africa where close to 50 percent of countries in Sub-Saharan Africa were substantially off-course from achieving the MDG extreme poverty target, despite the sub-region enjoying more than two decades of growth resurgence (Asongu & Nwachukwu, 2016a). The benefits of globalization over the past decades in developing countries have fundamentally been reaped by China.

Concerning the second question, a valuable lesson for laggard countries in growth quality is that prioritizing economic governance over political governance, as China has done over the past decades, could lead to more inclusive growth. Political governance is the election and replacement of political leaders while economic governance is the formulation and implementation of policies that deliver public commodities (Asongu & Nwachukwu, 2016b). Hence, by prioritizing economic governance over political governance, most countries in Sub-Saharan Africa can improve avenues of increasing inclusive growth in the post-2015 sustainable development era[20]. By extension, such priority in economic governance cannot be fully respected when conditions for delivering public services, increasing social mobility and decreasing unemployment vulnerability are not conducive to this. Accordingly, civil wars and political strife have characterized the least performing countries which we have

[20] For brevity and lack of space, we invite the reader to consult Asongu and Ssozi (2016) for the relevant literature motivating this policy inference. These authors have surveyed more than 110 studies on Sino-African relations to define the model applied by China as encompassing three main features: de-emphasized democracy, state capitalism and priority in economic rights.

highlighted (i.e. Chad and the Central African Republic) over the past decades. Peace is essential for quality of growth. Therefore, it is no coincidence that during the sample periodicity most of the conflict-torn countries in the world were in SSA[21].

[21] "*In summary, seven of the nine cases of total chaos and societal breakdowns known in recent history have been registered in Africa (with the exceptions of Afghanistan and Syria): Angola, Burundi, Sierra Leone, Liberia, Zaire/Congo, Somalia, and Sudan* " (Asongu, 2014d, p. 1569).

Appendices

Appendix 1: Definition of variables

Variable(s)	Definition(s)	Source(s)
Quality of Growth Index (QGI)	"*Composite index ranging between 0 and 1, resulting from the aggregation of components capturing growth fundamentals and from components capturing the socially-friendly nature of growth. The higher the index, the greater is the quality of growth*" (p. 25).	Mlachila et al. (2014)
Educational Spending	"*Public resources allocated to education spending, as percent of GDP*" (p. 25)	Mlachila et al. (2014)
Health Spending	"*Public resources allocated to heath spending, as percent of GDP*" (p. 25)	Mlachila et al. (2014)
Government Stability	"*Index ranging from 0 to 12 and measuring the ability of government to stay in office and to carry out its declared program(s).The higher the index, the more stable the government is*" (p. 25).	Mlachila et al. (2014)
Inflation	Inflation rate based on the Consumer Price Index (CPI)	Mlachila et al. (2014)
Credit to private sector	"*Domestic credit to private sector, namely credit offered by the banks to the private sector, as percent of GDP*" (p. 25).	Mlachila et al. (2014)
Foreign Direct Investment	"*Net Inflows of Foreign Direct Investments, as percent of GDP*" (p. 25)	Mlachila et al. (2014)
Remittances	"*Workers' remittances and compensation of employees (Percent of GDP), calculated as the sum of workers' remittances, compensation of employees and migrants' transfers*" (p. 25).	Mlachila et al. (2014)
Foreign Aid	"*Official development Aid actually disbursed, as percent of GDP*" (p. 25)	Mlachila et al. (2014)
Rule of Law	"*Index assessing the strength and the impartiality of the legal system, as well as the popular observance of the law. The index ranges from 0 to 6, with a higher value of the index reflecting a higher institutional Quality*" (p. 25).	Mlachila et al. (2014)
Quality of Bureaucracy	"*Index of the institutional strength and quality of the bureaucracy, ranging from 0 to 4. The higher the index, the stronger the quality of the bureaucracy*" (p. 25)	Mlachila et al. (2014)

Appendix 2: Summary Statistics

	Mean	S. D	Minimum	Maximum	Obs
Quality of Growth Index (QGI)	0.604	0.140	0.258	0.849	372
Quality of Growth Index (QGI)(log)	-0.535	0.260	-1.354	-0.163	372
Educational Spending	0.612	0.263	0.000	1.000	372
Health Spending	0.676	0.208	0.089	0.995	372
Government Stability	18.518	165.55	2.666	2873.8	303
Inflation (log)	2.331	1.358	-0.637	8.767	339
Domestic Credit (log)	3.355	0.798	0.529	5.131	345
Foreign Direct Investment	3.225	4.867	-4.172	62.264	366
Remittances	4.117	7.391	0.001	63.295	322
Foreign Aid	4.921	5.771	-9.546	36.317	226
Rule of Law	3.290	1.060	0.666	5.933	301
Quality of Bureaucracy	1.693	0.772	0.000	4.000	301

S.D: Standard Deviation. Obs: Observations.

Appendix 3: Correlation Matrix

Educ	Health	GovStab	Infl(log)	Credit(log)	FDI	Remit	Aid	Law	Bureau	QGI	QGI(log)	
1.000	0.594	0.024	-0.007	0.152	0.048	0.419	-0.014	0.219	0.214	0.098	0.119	Educ
	1.000	0.036	0.032	0.231	0.133	0.265	-0.070	0.214	0.228	0.340	0.331	Health
		1.000	-0.002	-0.007	-0.050	-0.046	0.160	0.355	0.025	-0.119	-0.130	GovStab
			1.000	-0.103	-0.111	-0.058	0.088	-0.100	-0.071	-0.003	0.015	Infl(log)
				1.000	-0.047	-0.018	-0.230	0.235	0.464	0.551	0.539	Credit(log)
					1.000	0.134	-0.062	0.130	-0.069	0.038	0.038	FDI
						1.000	-0.027	-0.040	-0.058	-0.033	-0.020	Remit
							1.000	-0.059	-0.304	-0.572	-0.581	Aid
								1.000	0.256	0.352	0.347	Law
									1.000	0.493	0.491	Bureau
										1.000	0.991	QGI
											1.000	QGI(log)

Educ: Educational Spending. Health: Health Spending. GovStab: Government Stability. Infl: Inflation. Credit: Domestic Credit. FDI: Foreign Direct Investment. Remit: Remittances. Aid: Foreign Aid. Law: Rule of Law. Bureau: Bureaucracy. QGI: Quality of Growth Index.

Appendix 4: Categorization of countries

Categories	Panels	Countries	Number
Income Levels	Low Income	"Burundi, Benin, Burkina Faso, Bangladesh, Central African Republic, Ethiopia, Ghana, Guinea, The Gambia, Equatorial Guinea, Kenya, Kyrgyz Republic, Lao PDR, Madagascar, Mali, Mozambique, Mauritania, Malawi, Niger, Nigeria, Nepal, Pakistan, Rwanda, Senegal, Sierra Leone, Chad, Togo, Tajikistan, Tanzania, Uganda, Uzbekistan, Vietnam, Yemen, Congo Democratic Republic, Zambia".	36
	Middle Income	"Albania, Argentina, Armenia, Azerbaijan, Bulgaria, Belarus, Bolivia, Brazil, Botswana, Chile, China, Cameroon, Congo Republic, Colombia, Costa Rica, Cuba, Djibouti, Algeria, Ecuador, Egypt, Gabon, Georgia, Guatemala, Honduras, Indonesia, India, Iran, Jordan, Kazakhstan, Sri Lanka, Lesotho, Lithuania, Latvia, Morocco, Moldova, Mexico, Mongolia, Malaysia, Namibia, Nicaragua, Panama, Peru, Philippines, Poland, Paraguay, Romania, Russia, Sudan, El Salvador, Swaziland, Syria, Thailand, Tunisia, Turkey, Uruguay, Venezuela, South Africa".	57
	Lower Middle Income	"Albania, Armenia, Azerbaijan, Bolivia, China, Cameroon, Congo Republic, Colombia, Djibouti, Algeria, Ecuador, Egypt, Georgia, Guatemala, Honduras, Indonesia, India, Iran, Jordan, Sri Lanka, Lesotho, Morocco, Moldova, Mongolia, Namibia, Nicaragua, Peru, Philippines, Paraguay, Sudan, El Salvador, Swaziland, Syria, Thailand, Tunisia"	35
	Upper Middle Income	"Argentina, Bulgaria, Belarus, Brazil, Botswana, Chile, Costa Rica, Cuba, Gabon, Kazakhstan, Lithuania, Latvia, Mexico, Malaysia, Panama, Poland, Romania, Russia, Turkey, Uruguay, Venezuela, South Africa"	22
Regions	Asia & Pacific	"Bangladesh, China, Indonesia, India, Lao PDR, Sri Lanka, Mongolia, Malaysia, Nepal, Philippines, Thailand, Vietnam".	12
	Central & Eastern Europe	"Albania, Azerbaijan, Bulgaria, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Lithuania, Latvia, Moldova, Poland, Romania, Russian Federation, Tajikistan, Turkey, Uzbekistan".	16
	Latin America	"Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Honduras, Mexico, Nicaragua, Panama, Peru, Paraguay, El Salvador, Uruguay, Venezuela".	17
	Middle East &	"Djibouti, Algeria, Egypt, Iran, Jordan, Morocco, Pakistan,	10

	North Africa	Syria, Tunisia, Yemen".	
	Sub-Saharan Africa	"Burundi, Benin, Burkina Faso, Botswana, Central Africa Republic, Côte d'Ivoire, Cameroon, Congo Republic, Ethiopia, Gabon, Ghana, Guinea, The Gambia, Equatorial Guinea, Kenya, Lesotho, Madagascar, Mali, Mozambique, Mauritania, Malawi, Namibia, Niger, Nigeria, Rwanda, Sudan, Senegal, Sierra Leone, Swaziland, Chad, Togo, Tanzania, Uganda, South African, Congo Democratic Republic, Zambia".	36
Fragility	Fragile	"Burundi, Central Africa Republic, Côte d'Ivoire, Congo Republic, Georgia, Guinea, Nepal, Sudan, Sierra Leone, Chad, Togo, Tajikistan, Yemen, Congo Democratic Republic".	14
	Non Fragile	"Albania, Argentina, Armenia, Azerbaijan, Benin, Burkina Faso, Bangladesh, Bulgaria, Belarus, Bolivia, Brazil, Botswana, Chile, China, Cameroon, Colombia, Costa Rica, Cuba, Djibouti, Algeria, Ecuador, Egypt, Ethiopia, Gabon, Ghana, The Gambia, Equatorial Guinea, Guatemala, Honduras, Indonesia, India, Iran, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Lao PDR, Sri Lanka, Lesotho, Lithuania, Latvia, Morocco, Moldova, Madagascar, Mexico, Mali, Mongolia, Mozambique, Mauritania, Malawi, Malaysia, Namibia, Niger, Nigeria, Nicaragua, Pakistan, Panama, Peru, Philippines, Poland, Paraguay, Romania, Russia, Rwanda, Senegal, El Salvador, Swaziland, Syria, Thailand, Tunisia, Turkey, Tanzania, Uganda, Uruguay, Uzbekistan, Venezuela, Vietnam, South Africa, Zambia".	79
Resources	Resource-rich	"Albania, Azerbaijan, Bolivia, Botswana, Chile, Côte d'Ivoire, Cameroon, Congo Republic, Algeria, Ecuador, Gabon, Guinea, Equatorial Guinea, Indonesia, Iran, Kazakhstan, Lao PDR, Mexico, Mali, Mongolia, Mauritania, Niger, Nigeria, Peru, Russia, Sudan, Syrian, Chad, Uzbekistan, Venezuela, Vietnam, Yemen, Congo Democratic Republic, Zambia".	34
	Non resource-rich	"Argentina, Armenia, Burundi, Benin, Burkina Faso, Bangladesh, Bulgaria, Belarus, Brazil, Central African Republic, China, Colombia, Costa Rica, Cuba, Djibouti, Egypt, Ethiopia, Georgia, Ghana, The Gambia, Guatemala, Honduras, India, Jordan, Kenya, Kyrgyz Republic, Sri Lanka, Lesotho, Lithuania, Latvia, Morocco, Moldova, Madagascar, Mozambique, Malawi, Malaysia, Namibia, Nicaragua, Nepal, Pakistan, Panama, Philippines, Poland, Paraguay, Romania, Rwanda, Senegal, Sierra Leone, El Salvador, Swaziland, Togo, Thailand, Tajikistan, Tunisia, Uganda, Uruguay, South Africa".	59
Performance	Hopefuls	"Burundi, Benin, Burkina Faso, Bangladesh, Central African Republic, Côte d'Ivoire, Cameroon, Congo Republic, Djibouti, Ethiopia, Gabon, Guinea, The Gambia, Equatorial Guinea, Lesotho, Madagascar, Mali, Mozambique, Mauritania, Malawi, Niger, Nigeria, Pakistan, Rwanda, Sudan, Senegal, Sierra Leone, Swaziland, Chad, Togo, Uganda, Yemen, Congo Democratic Republic".	33
	Contenders	"Azerbaijan, Bolivia, Georgia, Ghana, Guatemala, Iran, Lao PDR, Morocco, Mongolia, Namibia, Nicaragua, Nepal, Tajikistan, Tanzania, Uzbekistan, Zambia".	16
	Best Performers	"Albania, Argentina, Armenia, Bulgaria, Belarus, Brazil, Botswana, Chile, China, Colombia, Costa Rica, Cuba, Algeria, Ecuador, Egypt, Honduras, Indonesia, India, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Sri Lanka, Lithuania, Latvia, Moldova, Mexico, Malaysia, Panama, Peru, Philippines, Poland, Paraguay, Romania, Russia, El Salvador, Syria,	44

		Thailand, Tunisia, Turkey, Uruguay, Venezuela, Vietnam, South Africa".	
Non-overlapping intervals	1990-1994	Full Sample	93
	1995-1999	Full Sample	93
	2000-2004	Full Sample	93
	2005-2011	Full Sample	93

The sub-regions which do not add-up to 93 are entirely an issue with the database of Mlachila et al. (2014) and not a calculation mistake by the authors.

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