Comparative Determinants of Quality of Growth in Developing Countries

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Abstract

This study explores a new dataset in order to present the comparative determinants of growth quality in 93 developing countries for the period 1990-2011. We employ both cross-sectional and panel estimation techniques with contemporary and non-contemporary specifications. The determinants are quite heterogeneous in significance and magnitude with substantial inclinations to specifications and estimation techniques. We present and discuss the findings in increasing magnitude of significance so as to ease comparative readability. We also discuss how specificities in the modelling techniques are relevant for targeting growth quality. The results are timely and relevant for the post-2015 inclusive and sustainable development agenda.

1. Introduction

The study on determinants of the quality of growth index (QGI) documented by Mlachila et al. (2014) leave room for improvement in three areas: (i) data, (ii) methodology and (iii) need to report and interpret estimated coefficients (Asongu & Nwachukwu, 2017a)[1]. First, the relevance of improving data is threefold. (i) We provide determinants based on 17 fundamental characteristics (or sub-panels) of development as opposed to the 7 documented by the underlying study (p. 30)[2]. In addition to those clearly articulated but unexploited by the underlying paper[3], we also derive three sub-panels based on time-consistent 'quality of growth' performance that are not explicitly circumvented (p. 16). These include: *Best Performers*, *Hopefuls* and *Contenders* in growth quality[4]. The interest of doing so is to provide more options to policy makers. (ii) The dimension of social spending used in the paper is decomposed into its educational and health components to provide more room for policy implications. (iii) The underlying study introduces the 'rule of law', 'corruption-control' and 'aggregate institutional quality' into the same specifications. This results in issues of multicollinearity owing to high degrees of substitutions among the variables. We avoid this specification issue in order to prevent estimated coefficients (with a high degree of substitution) emerging with unexpected signs.

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[1] The QGI is composed of two main components, notably: (i) growth fundamentals (strength, volatility, sectoral composition and demand composition) and (ii) social outcomes (health and education). Hence, the proposed QGI entails both social dimensions and the intrinsic nature of economic growth. Accordingly, the QGI goes beyond the well established Human Development Index (HDI) developed by the United Nations by not exclusively concentrating on the levels of incomes, but also on the very nature of growth.

[2] The 17 fundamental characteristics are sub panels by which the dataset is disaggregated. This include Growth Quality (GQ) performance (Hopefuls (Hope), Contenders (Cont) and Best performers (Best)); State fragility (Fragile (Frag) and Non-Fragile (Non-Fragile) countries); resource-wealth (Resource-rich (RR), Resource-poor (RP)); income levels (Low-income (LIC), Middle-income (MIC), Lower-middle-income (LMIC) and Upper-middle-income (UMIC); regions (Sub-Saharan Africa (SSA), Middle East & North Africa (MENA), Asia & Pacific (AP), Central & Eastern Europe (CEE) and Latin America(LA)) and non-overlapping intervals (1990-1994; 1995-1999; 2000-2004 & 2005-2011).

[3] Fundamental sub-panels are depicted in Figures 2-3 (pp. 13-14) and Figure 4 (p. 16). We employ 'underlying study' and Mlachila et al. (2014) interchangeably.

[4] Best Performers, Hopefuls and Contenders are respectively groups of countries with high, intermediate and low performance in terms of growth quality. The qualification is based on Figure 4 of Mlachila et al. (2014, p. 16).

Second, on the methodological front, the regressions employed are one lagged non-contemporary Ordinary Least Squares (OLS) estimations for the Full sample (p. 21) and contemporary estimations for 7 sub-samples (p. 30). We improve this dimension in three main areas: data structure, time-oriented specifications and a complementarity of OLS. (1) Both cross-sectional and panel specifications are employed in the current study. The former is time-dynamic to enable an appreciation across time. (2) The specifications are both contemporary and non-contemporary to offer more insights into the linkages. (3) OLS are complemented with Fixed Effects (FE) or Random-Effects (RE) regressions depending on the outcome of the Hausman test for endogeneity. The adopted FE regressions control for the unobserved heterogeneity.

Third, we do not limit the reporting and interpretation of estimated coefficients to their signs (p. 30). Hence, we also discuss their magnitudes across specifications and fundamental characteristics. Building on the above, this study investigates the determinants of quality of growth in developing countries with particular emphasis on fundamental characteristics of inclusive growth.

The policy relevance of the study builds the fact that the conception, definition and measurement of 'inclusive growth' employed as the outcome indicator in this study is in line with at least six of the seventeen Sustainable Development Goals (SDGs), namely: Goal 1('end poverty in all its forms everywhere'), Goal 2 ('end hunger, achieve food security and improved nutrition and promote sustainable agriculture'); Goal 3 ('ensure healthy lives and promote well-being for all ages'); Goal 4 ('ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'); Goal 8 ('promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all') and Goal 10 (reduce inequality within and among countries) (see Asongu & Le Roux, 2017).

The remainder of the paper is organized in the following manner. Contemporary issues on growth and inclusive development are covered in Section 2. Section 3 discusses the data and methodology. The empirical analysis and discussion of results are covered in Section 4. Section 5 presents concluding implications.

2. Contemporary issues in growth and inclusive development

The transition from Millennium Development Goals (MDGs) to SDGs after 2015 calls for inclusive growth strategies because sustained growth is sustainable when it is inclusive: "*In fact, sustained growth plus inclusive growth is sustainable growth, which is the objective dimension of sustainable development*" (Asongu et al., 2014, p.11). This narrative is consistent with the substantially documented critical dimension of income-inequality in growth-poverty relationships (Thorbecke, 2013). In essence, because the growth elasticity of poverty is lower than the inequality elasticity of poverty, the poverty-growth nexus is a decreasing function of inequality (Fosu, 2015; Asongu & Nwachukwu, 2016a). The assertion has been consistently verified and confirmed in developing countries[5].

The association of output with negative income externalities or "immiserizing growth" reminds scholars of Lewis: "*Output may be growing, and yet the mass of the people may be becoming poorer*" (Lewis, 1955). "*Lewis led all developing countries to water, proverbially speaking, some African countries have so far chosen not to drink*" (Amavilah, 2014, p. 2). In essence, the recent evidence of Africa 'being on time' for some MDGs extreme poverty targets (Pinkivskiy & Sala-i-Martin, 2014) is also being contrasted with stylized facts

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[5] The conclusions are valid for African (Fosu, 2008, 2009, 2010a, 2010b) as well as a broader sample of developing nations (Fosu, 2010c). The interested reader can refer to, *inter alia*: "*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).

documenting that inequality is limiting the equal distribution of fruits from economic prosperity (Blas, 2014)[6].

Recent inclusive growth literature has focused on, *inter alia*: gender inequality (Anyanwu, 2014a, 2013a; Baliamoune-Lutz, 2007; Baliamoune-Lutz, 2007 & McGillivray, 2009; Elu & Loubert, 2013), relationships between finance, growth, employment and poverty (Odhiambo, 2009, 2011), the role of finance in poverty eradication (Odhiambo, 2010a, 2010b, 2013; Asongu & Nwachukwu, 2017b, 2017c), linkages between mobile banking, human development and information technology in inclusive development (Asongu & Nwachukwu, 2017c; Asongu & Le Roux, 2017), correlates of poverty (Anyanwu, 2014b, 2013b), debates over absolute pro-poor (Ravallion & Chen, 2003) versus relative pro-poor growth (Dollar & Kraay, 2002) and measurements and determinants of inclusive growth (Anand et al., 2013; Mlachila et al., 2014). The last strand is closest to the present inquiry which assesses determinants of inclusive growth in developing countries.

An inclusive growth indicator that accounts for inequality has been proposed by Anand et al. (2013). It is motivated by an underlying literature on the need for inclusive growth to encompass growth that reduces poverty sustainably (Kraay, 2004; Berg et al., 2011ab). The adopted concept of growth in the measurement is *absolute pro-poor growth*, maintains that for growth to be inclusive it must benefit the poor absolutely (Ravallion & Chen, 2003). The authors have argued that the alternative version or *relative pro-poor growth* which maintains that growth is inclusive only when it mitigates inequality through positive income benefits for the poor (see Dollar & Kraay, 2002), could be associated with sub-optimal externalities for majority of poor and rich households. Moreover, the definition of inclusiveness and conception of inclusive growth encapsulate characteristics, like: equal

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[6] It is also important to note that, narratives of the African growth miracle are contingent on the periodicity of study (Young, 2012). Therefore, compared to the 1980-2010 period, the continent's relative better poverty decline with respect to other regions of the World depends on its growth resurgence which began in the mid-1990s (Fosu, 2015, p. 44). A narrative that is consistent with recent evidence on countries in the continent converging with the USA only from the mid-1990s (Alan & Carlyn, 2015, p. 598).

opportunities, equity, employment transitions and market protection. Hence, the inclusive growth measurement entails increasing growth and economic expansion via level-playing fields of employment, evolving investment and productivity (Anand et al., 2013).

Mlachila et al. (2014) have complemented Anand et al. (2013) by combining previous concepts, definitions and appreciations of pro-poor growth into a new indicator, termed 'quality of growth'. The index also builds on an evolving literature on inclusive growth (see Ianchovichina & Gable, 2012; Commission on Growth & Development, 2008). Building on the evidence that growth in sub-Saharan Africa has not been associated with reduction in inequality, poverty and unemployment (Dollar & Kraay, 2002; Martinez & Mlachila, 2013; Dollar et al., 2013; Ola-David & Oyelaran-Oyeyinka, 2014), the indicator considers inclusive growth as pro-poor growth that is high, durable and socially friendly. Therefore, according to the narrative, certain features are essential for growth quality, among others: strength, stability, growing productivity, sustainability and socially-friendly outcomes like better living standards and poverty reduction. The present inquiry extends Mlachila et al. (2014) because it has incorporated social dimensions into the intrinsic value of growth.

The positioning of the inquiry complements the literature which has criticised Piketty's literature by emphasising the need to include developing countries in the debate. Piketty's celebrated '*capital in the 21st century*' (Piketty, 2014) has substantially debunked the Kuznets' (1955, 1971) orthodoxy on an inverted U-shaped nexus between inequality and industrialization, paving the way to many evolving strands in the literature. (i) The causes of inequality, *inter alia*: globalization-driven debts, theorized by Azzimonti et al. (2014) in OECD[7] nations and partially confirmed in African countries (Asongu et al., 2015) and adulterated democracy (Stiglitz, 2014). (ii) The consequences of inequality, like increasing poverty and diminishing growth (Ncube et al., 2014). (iii) Commentary-based responses such

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[7] The Organization for Economic Co-operation and Development.

as cross-checking of facts (Branko, 2014; Krusell & Smith, 2014), reviews (Allen, 2014; Homburg, 2014) and data quality analysis (Reynolds, 2014). (iv) The neglect of developing countries where the poor by Piketty's standard is super-rich in some developing countries (Asongu & Nwachukwu, 2016b).

3. Data and Methodology
3.1 Data and fundamental characteristics

We investigate a sample of 93 developing nations with data from Mlachila et al. (2014) for the period 1990-2011. The publicly available dataset is in non-overlapping averages: 1990-1994; 1995-1999; 2000-2004 and 2005-2011. The authors have computed the quality of growth index (QGI) using data from various sources, among others: World Development Indicators of the World Bank, Barro and Lee (2010), Sala-i-Martin (2006), the International Monetary Fund's (IMF's) World Economic Outlook database and the United Nation's (UN's) COMTRADE database.

Two steps are followed in the construction of the QGI, notably: the first set of variables are standardized to produce indices of symmetric scale and (ii) then aggregated using different weights to derive a single composite index. It is important to note that the plethora of indicators used is not expressed in the same units in order to achieve the aggregated single index. Two main approaches are employed to tackle the concern of different measurement units, namely: the Min-Max approach and the Z-score or centered-reduced normalization approach.

The dependent variable is the QGI while determinants which are consistent with the underlying study include: *health spending, education spending, inflation, government stability, foreign direct investment (FDI), private domestic credit, remittances, quality of bureaucracy, foreign aid,* and *rule of law*. A complete definition of the variables is presented in Appendix 1.

As discussed in the introduction, two main differences characterize the dataset, relative to the underlying study. First, we have disaggregated the variable of *social spending* into its education and health components. Second, we do not incorporate indicators with a high degree of substitution[8]. Hence, we have used the *rule of law* indicator and dropped *corruption-control* and *aggregated institutional quality* because the three are highly correlated.

The independent variables used by the underlying study which are in accordance with Anand et al. (2013, p. 16) are justified by a bulk of inclusive growth literature. With the exception of inflation which should naturally mitigate growth quality because of decreasing purchasing power, other determinants should have expected positive signs for the most part. It should be noted that only high inflation potentially mitigates growth quality. Accordingly, low/stable inflation may have positive income-equalization effects because it stimulates private consumption and investment needed to boost economic growth (Asongu, 2013). The justifications provided for the positive signs are based on a broad stream of inclusive growth literature (Barro & Lee, 2000; Anand et al., 2012; Mishra, et al., 2011; Calderon & Servén, 2004; Dollar & Kraay, 2003; Seneviratne & Sun, 2013; Levine, 2005; IMF, 2007; Hausmann et al., 2007).

As maintained by the IMF (2007) and Anand et al. (2013), macroeconomic stability, structural change and human capital are important pro-poor growth drivers in developing nations. While the second (or structural change) embodies globalisation (trade openness & FDI) the first and third entail features that have been documented as growth factors in the catch-up literature (educational levels, fixed investment and technological change). Other macroeconomic fundamentals and structural features entail: financial development (Levine,

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[8] It is important to note that social spending is used by Mlachila et al. (2014). (Please see Table 3 on page 21 of the study). Accordingly, in the assessment of the determinants by Mlachila et al. (2014), the two (health and education) dimensions are considered as a social composite component. We steer clear by using the education and health components independently.

2005); inflation and volatility of output (Dollar & Kraay, 2003; Barro & Lee, 2010); improving status in the value chain ladder of commodities (Hausmann et al., 2007; Anand et al., 2012); infrastructural quality improvement (Seneviratne & Sun, 2013; Calderon & Servén, 2004) and modernizing production processes (Mishra et al., 2011).

Appendix 2 presents the summary statistics which shows that the variables are comparable based on some considerable degree of variation. Hence, we can be certain that some reasonable estimated linkages would emerge. Potential concerns of multicollinearity are mitigated with the correlation matrix in Appendix 3. Sub-panels are based on five criteria from which we derive 17 fundamental features[9]. The multiple characteristics enable us to extend concerns about heterogeneity in factors presented in Table 3 (p. 21) of the underlying study. The additional features which are derived from Figures 2-3 (pp. 13-14) and Figure 4 (p. 16) include: GQ performance (Hopefuls (Hope), Contenders (Cont) and Best performers (Best)); State fragility (Fragile (Frag) and Non-Fragile (Non-Fragile) countries); resource-wealth (Resource-rich (RR), Resource-poor (RP)); income levels (Low-income (LIC), Middle-income (MIC), Lower-middle-income (LMIC) and Upper-middle-income (UMIC); regions (Sub-Saharan Africa (SSA), Middle East & North Africa (MENA), Asia & Pacific (AP), Central & Eastern Europe (CEE) and Latin America(LA)) and non-overlapping intervals (1990-1994; 1995-1999; 2000-2004 & 2005-2011).

3.2 Methodology

Contemporary and non-contemporary comparative determinants are assessed from both cross-sectional and panel specifications. While panel specifications are contemporary and non-contemporary, cross-sectional regressions are only non-contemporary owing to the nature of the data structure. In the former specifications, Heteroscedasticity and Autocorrelation Consistent (HAC) standard errors OLS are used to complement Fixed Effects

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[9] For lack of space, a table on the fundamental characteristics can be provided upon request.

(FE) regressions. A Hausman test is employed to assess the presence of endogeneity prior to the FE specifications that control for the unobserved heterogeneity. The cross-sectional contemporary regressions are Heteroscedasticity-consistent.

The following are steps in the estimation process.

Step 1: Cross-sectional contemporary determinants (Table 1)

$$QGI_i = \alpha + \sum_{j=1}^{10} \delta_j W_{j,i} + \varepsilon_i \qquad (1)$$

This OLS estimation is based on Heteroscedasticity consistent standard errors (SE)

Step 2: Baseline Panel contemporary determinants (Table 2)

$$QGI_{i,t} = \alpha + \sum_{j=1}^{10} \delta_j W_{j,i,t} + \varepsilon_{i,t} \qquad (2)$$

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 and $\varepsilon_{i,t}$ the error term.

Step 3: Baseline Panel non-contemporary determinants (Table 3)

$$QGI_{i,t} = \alpha + \sum_{j=1}^{10} \delta_j W_{j,i,t-1} + \varepsilon_{i,t} \qquad (3)$$

Eqs (2) and (3) are based on HAC standard errors OLS.

Step 4: Panel Fixed Effects contemporary determinants (Table 4)

$$QGI_{i,t} = \alpha + \sum_{j=1}^{10} \delta_j W_{j,i,t} + \eta_i + \xi_t + \varepsilon_{i,t} \qquad (4)$$

Where, η_i is the country-specific effect and ξ_t is the time-specific effect.

Step 5: Panel Fixed Effects non-contemporary determinants (Table 5)

$$QGI_{i,t} = \alpha + \sum_{j=1}^{10} \delta_j W_{j,i,t-1} + \eta_i + \xi_t + \varepsilon_{i,t} \qquad (5)$$

Eqs (4) and (5) are based HAC standard errors with control for both country-specific and time effects. The choice of the Fixed Effects model is justified by a significant Hausman test for endogeneity.

4. Empirical results

4.1. Cross-sectional determinants

Table 1 below which presents cross-sectional regressions based on Eq. (1), broadly confirms findings of the underlying study, with the exception of *inflation* (*rule of law*) that has a positive (negative) effect. It provides three clarifications in relation to the underlying paper, notably: (i) the positive correlation of *domestic credit* is most apparent in the period 2005-2011; (ii) the positive correlation of *FDI* is more visible in the periods 1995-1999 and 2000-2004; (iii) the negative correlation of *foreign aid* is not apparent during the 2005-2011 interval and (iv) the *rule of law* is negatively linked to growth quality in the initial period (1990-1994).

"Insert Table 1 here"

4.2 Panel determinants

Table 2, Table 3, Table 4 and Table 5 below respectively present 'baseline contemporary determinants in HAC SE OLS'[10], 'baseline non-contemporary determinants in HAC SE OLS', 'HAC SE Panel FE'[11] contemporary determinants' and 'HAC SE Panel FE' non-contemporary determinants. Tables 2-5 are also respectively consistent with Eqs. (2)-(5). Our three-step line of interpretation is simple to follow. For every table and in chronological order, we discuss: (i) expected and unexpected signs; (ii) the findings in relation to the underling paper and (iii) comparative evidence between sub-samples in terms of signs and magnitudes.

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[10] Heteroscedasticity and Autocorrelation Consistent (HAC) Standard Errors (SE) Ordinary Least Squares (OLS).

[11] Heteroscedasticity and Autocorrelation Consistent (HAC) Standard Errors (SE) Panel Fixed Effects (FE).

The following can be established for Table 2. First, the estimated coefficients in terms of expected signs are very heterogeneous. Second, the findings are also not broadly consistent with the underlying paper. Third, we compare the estimates in chronological (or from education to bureaucracy) and increasing order of magnitude in significance. (i) *Education spending* is positively (negatively) significant for LIC, SSA and Contenders (LA & Best Performers). (ii) *Health spending* is consistently positive in: LA, RP, UMIC, NFrag, Full Sample and Contenders. (iii) With the exception of LA, *government stability* is positive in: {NFrag, Full Sample}[12], Contenders, LIC, SSA, Hopefuls and AP. (iv) The effect of *inflation* is consistently positive: MIC, {NFrag, Full Sample}, Hopefuls, {RP, LIC}, SSA and AP. (v) With the exception of Contenders, the impact of *domestic private credit* is also overwhelmingly positive: SSA, {RP, Hopefuls}, LIC, {NFrag, Full Sample}, LIMC, RR and MENA. (vi) The impacts of *FDI* are also consistently positive: Full Sample, {LA, LMIC, NFrag, Contenders}, {Best Performers & MIC}. (vii) On the incidence of *remittances*, but for LA, the following are appealing: RP, Contenders, {Hopefuls, LIC} and UMIC. (viii) Excluding AP, *foreign aid* has a negative impact in: Hopefuls, {SSA, LIC}, LMIC, {RP, NFrag, Full Sample}, RR and UMIC. (ix) The *rule of law* is sparingly negative in: Hopefuls and Contenders. (x) The impact of *bureaucratic quality* is consistently positive in: Hopefuls, SSA, LIC, RR, RP, Full Sample, LA, NFrag and UMIC.

"Insert Table 2 here"

In Table 3 below showing non-contemporary OLS regressions, we have failed to provide findings for the CEE and Fragile countries because of issues in degrees of freedom. We use 'nsa' (not specifically applicable) to denote this concern. This further highlight the issues of publication bias in social sciences raised in the introduction (Rosenberg, 2005).

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[12] Two or more fundamental characteristics in '{}' denote sub-panels with the same sign and magnitude.

Within this framework, the concern of the bias is based on strong results versus null results (Franco et al., 1991). In what follows, we discuss the findings with particular emphasis on the comparative element of the line of inquiry. Hence, in addition to following our simple three-step line of interpretation, we also present comparative evidence with respect to Table 2.

The following can be established for Table 3. First, the estimated coefficients in terms of expected signs are very heterogeneous. Second, the findings are also not broadly consistent with the underlying paper. Third, with additional emphasis on Table 2, we compare the estimates in chronological (or from education to bureaucracy) and increasing order of magnitude in significance.

(i) *Education spending* is positively (negatively) significant for LIC, Hopefuls and SSA (Best Performers, LA & UMIC). In relation to Table 2, Hopefuls replace Contenders in a previously third place of positive effects; while UMIC appears in the rankings and the effect in Best Performers is now less negative in relation to LA.

(ii) *Health spending* is consistently positive in: {Full Sample, NFrag}, UMIC, LA, RR and AP. In relation to Table 2, RP and Contenders are now replaced by RR and AP. The order of increasing positive magnitude has also changed substantially (previously: LA, RP, UMIC, NFrag, Full Sample & Contenders).

(iii) With the exception of UMIC, *government stability* is positive in {NFrag, Full Sample}, LIC, SSA, Hopefuls, RR and AP. UMIC replaces LA in the negative effect while Contenders (RR) leaves (enters) the rankings. But the order of magnitude in significance remains unchanged (previously, {NFrag, Full Sample}, Contenders, LIC, SSA, Hopefuls & AP).

(iv) With the exception of UMIC, the effect of *inflation* is consistently positive: SSA, Hopefuls, MIC, {LMIC, RP, NFrag} and Full Sample. Now the effect in one of the regions is

negative (UMIC), LMIC replaces MIC while AP leaves the rankings. The corresponding order in Table 2 was: MIC, {NFrag, Full Sample}, Hopefuls, {RP, LIC}, SSA and AP.

(v) *Domestic private credit* is consistently positive in {SSA, RP}, MIC, NFrag, Full Sample, Hopefuls, UMIC, LIC, NFrag, LIMC, RR and MENA. In relation to the previous table: the negative effect of Contenders is no longer apparent, UMIC and MIC enter into the rankings, while the MENA leaves (previously: SSA, {RP, Hopefuls}, LIC, {NFrag, Full Sample, LIMC}, RR and MENA).

(vi) But for AP, the effect of *FDI* is positive in: Full Sample, NFrag, MIC, RP, UMIC and MENA. In relation to the contemporary findings, a substantial number of sub-panels enter (leave) RP, UMIC & MENA (LA, LMIC, Contenders & Best Performers) the rankings. The previous rankings are consistently positive in increasing order of: Full Sample, {LA, LMIC, NFrag, Cont}, {Best Performers & MIC}.

(vii) The impact of *remittances* is now: positive in the Hopefuls and negative in LA & UMIC, it was previously negative in LA and positive in RP, Contenders, {Hopefuls, LIC} & UMIC.

(viii) In addition to AP, the *foreign aid* effect is now also positive in UMIC, and negative in SSA, {LIC, Hopefuls}, {NFrag, Full Sample}, RP, RR, LMIC and MIC. Hopefuls and MIC now enter into the rankings while, the impact in UMIC becomes positive.

(ix) The *rule of law* which was sparsely negative (in Hopefuls & Contenders) is now more apparently negative (in Hopefuls, MENA, Contenders & LA) and positive in UMIC.

(x) Similar to the contemporary findings, the effect of *bureaucratic quality* is also consistently positive with fewer sub-panels: SSA, LA, Full Sample, NFrag, RP and UMIC. Accordingly, Hopefuls, LIC and RR leave the rankings.

"Insert Table 3 here"

Due to substantial issues in degrees of freedom in the specification of some panels in Tables 4-5, we relax the third point of the three-step line of interpretation and discuss comparative findings of both tables simultaneously. In addition, for more subtlety in the policy implications, we relate Tables 2-3 to the corresponding discussions in the light of how the modeling technique actually affects the positive significance of the results. Overall, the results substantially differ from those in Tables 2-3. This implies 'country specific'- and time-effects significantly influence the determinants in their effects on the QGI. As stated earlier, the choice between the Fixed Effects (FE) and Random Effects (RE) model is determined by the outcome of the Hausman test. A rejection of the null hypothesis of the underlying test implies the FE model is a better fit. In spite of issues in degrees of freedom that have affected some specifications and the Hausman test, we still present the available findings to mitigate any issues of publication bias towards null findings in social sciences.

The following can be established for Tables 4-5. First, the estimated coefficients in terms of expected signs are very heterogeneous. Second, the findings are also not broadly consistent with the underlying paper. Third, we compare the estimates of both tables in chronological (or from education to bureaucracy) and increasing order of magnitude in significance.

(i) *Education spending* is positively (negatively) significant for Best Performers (LA). The effects of education are more apparent in non-contemporary Fixed Effects (FE) where they are positive in: {NFrag, Full Sample}, {LIC, LMIC}, RP, {SSA & Hopeful}.

(ii) *Health spending* is positive (negative) in Hopefuls & LA (RR & Contenders) while there are no significant results in Table 5. Hence, FE modeling does not lead to positive effects.

(iii) But for LMIC, *government stability* is positive in {NFrag, & Full Sample} and there are no significant results in Table 5. We notice that the determinant in NFrag & Full Sample has also been positive in Tables 2-4.

(iv) *Inflation* is only positive (negative) for LA (MIC) in Table 4 (5). This implies that accounting for FE does not improve the inflation determinant because we have seen overwhelming positive effects in Tables 2-3.

(v) But for a positive effect in LA, the impact of *domestic private credit* is consistently negative in RP, {NFrag, Full Sample} & Best Performers. There are no significant results in Table 5. This implies modeling with FE overwhelming changes the signs from positive to negative.

(vi) *FDI* has positive impacts in RR, Best Performers, Contenders & LA while in Table 5 it appears positive only for RP. Two broad policy implications results: contemporary modeling leads to more positive effects and FE modeling should also be contemporary.

(vii) The effect of *remittances* is consistently negative in {RP, NFrag, Full Sample}, SSA & Contender for Table 4 and in LIC and SSA for Table 5. Overall, a change in modeling technique and contemporary character does not substantially affect the negative effect of *remittances*.

(viii) The impact of *foreign aid* is negative in Contenders, Best Performers & LA for Table 4 but overwhelmingly positive in Table 5 for {RP, NFrag}, Full Sample; Hope, {SSA, LIC} & LMIC. The fact that non-contemporary effects of *foreign aid* are positive implies modeling with FE regressions has more significant and positive effects for *foreign aid*.

(ix) The rule of law is positive (negative) for RP & Best Performers (Contenders & LA) and is positive for SSA in Table 5. Hence, in light of preceding tables, modeling the *rule of law* with FE has some appealing results.

(x) But for LMIC & RR that are negative, the effects of *bureaucratic quality* are consistently positive for contemporary FE regressions ({NFrag, Full Sample}, Hopefuls, {SSA, Best Performers}, RP, Contenders & LA) and only positive in for Best Performers in the corresponding non-contemporary regressions. It follows that the latter set of regressions with FE substantially mitigates the positive effect of this determinant that has been overwhelming in the preceding tables.

"Insert Table 4 here"

"Insert Table 5 here"

5. Concluding implications and future research directions

We set-out to explore a new database in order to present the comparative determinants of growth quality in 93 developing countries for the period 1990-2011. We have employed both cross-sectional and panel estimation techniques with contemporary and non-contemporary specifications. The empirical evidence has been based on 17 fundamental features of growth quality derived directly and indirectly from the underlying study motivating the inquiry (Mlachila et al., 2014). It is important to note that the impacts of the full sample and corresponding effects on each region are not homogenous. It is essentially for this reason that we summarize the main results in the concluding section with particular emphasis on clarifications of such heterogeneity. In what follows, we discuss concluding implications with emphasis on the inclusive development literature. Unless stated otherwise, the use of 'effect' or 'impact' below technically implies the effect or impact on growth quality across sub-panels.

We have established the following findings. First, from a cross-sectional perspective, the four interesting results have been noticeable to elucidate complementary findings to the underlying paper. (1) The positive correlation of *domestic credit* is most apparent in the

period 2005-2011. Two factors may explain this correlation. On the one hand, "*Banking credit to the private sector in Latin America has on average increased by 7 percent of GDP from primo 2004 to ultimo 2011, with real credit in some countries growing by up to 20 percent per year*" (Hansen & Sulla, 2013, p. 1). On the other hand, relative to other regions, Latin American countries have experienced higher levels of inequality mitigation over the past decade (Asongu et al., 2014, p.10). (2) The positive correlation of *FDI* is more visible in the periods: 1995-1999 and 2000-2004. While less visibility in the prior-1995 period could be traceable to a substantial drop in Global FDI (Olise et al., 2013, p.1), its absence in the post-2004 period could be explained by the recent global financial/economic crises. (3) The negative correlation of *foreign aid* is not apparent during the '2005-2011' interval. This may be due to the substantial drop in official development assistance due to the 2007-2008 global financial crises that later led to economic crisis which persisted through 2011 (Asongu, 2014b, p. 461). (4) The *rule of law* is negatively linked to growth quality in the initial period (1990-1994). This could be explained by the documented U-shaped nexus between democratisation (or governance) and economic growth in developing countries (Fosu, 2001, p.289) and growth resurgence in Africa which was experienced only in the mid-1990s (Fosu, 2015, p.44). Overall in terms of the signs of estimated coefficients, the results broadly confirm findings of the underlying study, with the exception of *inflation* (*rule of law*) that is positive (negative).

Second, results based on contemporary and non-contemporary OLS are very interesting in articulating the relevance of considering the contemporary character of determinants. The determinants are quite heterogeneous in significance and magnitude. They have been presented in increasing magnitude of significance so as to ease comparative readability. In articulating the comparative relevance of the determinants, which we cannot

reproduce here for space constraint, we have enhanced readability by ensuring that the findings are simply summarised and easy to follow.

Third, the findings of contemporary and non-contemporary panel FE have been further compared with those of the two-preceding tables to provide policy makers with some broad tendencies on how specification affects the outcome of the 10 determining factors. The following have been established. (i) The positive effect of *education* is most apparent in non-contemporary FE. (ii) Modelling with FE sparingly produces positive effects from *health spending*. (iii) In almost all the panel models and specifications, we observe that the effects of *government stability* are consistently positive in Non-Fragile states and the Full sample. (iv) The positive effect of low and stable *inflation* is not very apparent with FE modelling. (v) Specifying *private domestic credit* with FE overwhelming changes the sign of the determinant from positive to negative. (vi) On the *FDI* determinant, one interesting implication is noticeable: contemporary modeling results in more positive effects. (vii) Changes in modeling technique and the contemporary specification character do not overwhelmingly affect the negative effect of *remittances*. (viii) The overwhelmingly negative effects of *foreign aid* become consistently positive in non-contemporary FE. (ix) Also, modeling the *rule of law* with FE regressions reveals more positive results. (x) But for non-contemporary FE regressions, the impact of *bureaucratic quality* is overwhelmingly positive.

In light of the above, we clarify two corresponding implications that are relevant to policy makers: contemporary versus non-contemporary and baseline modeling versus FE regressions. First, the contemporaneous elements of the specifications are a critical policy direction on how to influence growth quality relative to given determinants. Accordingly, we have observed that some determinants are positively significant when they are contemporary than non-contemporary and vice-versa. Hence, the time-dynamic character of the determinants should be given the relevant considerations when targeting growth quality.

Second, we have also found that controlling for country- and time-effects substantially influences signs and magnitudes of significance across specifications. Accordingly certain variables do correlate better with time- and country-effects than others in the explanation of growth quality.

Due to space constraints, we further discuss only the unexpected positive signs of inflation and foreign aid which are the only determinants in the underlying study with negative signs. First, the puzzle with inflation is the rate of inflation. Accordingly, low and stable inflation are needed for sustainable economic growth. Monetarists term it 'constant inflation' (Congdon, 2014). Stable inflation has also been documented to be favorable to inclusive development. Albanesi (2007) has established that high inflation has a disequalizing income-distribution impact while according to Lopez (2004) and Bulir (1998), low inflation has the opposite effect. Second, foreign aid can be used as an instrument of inclusive human development (Asongu & Nwachukwu, 2017d). This would require *inter alia*: rethinking current development assistance models and orienting developing countries towards industrialization according to Piketty (2014), as opposed to Kuznets' (1955) conjectures on the nexus between inequality and industrialization.

We set-out to present comparative determinants of growth quality. Given the interesting results we have found, there is certainly room for more inquiries with alternative methodologies and specification techniques. Moreover, as more data become available, estimation approaches that account for the dynamic character of growth quality like the Generalised Method of Moments (GMM) are worthwhile. This is essentially because at least five data points are needed to employ the GMM. Unfortunately, the dataset is based on four data points.

Table 1: Cross sectional regressions (Contemporary determinants)

	90-94	95-99	00-04	05-11	90-94	95-99	00-04	05-11
	Without Heteroscedasticity Consistency				With Heteroscedasticity Consistency			
Constant	0.221	**0.442****	**0.381*****	0.145	0.221	**0.442*****	**0.381****	0.145
	(0.398)	**(0.020)**	**(0.000)**	(0.365)	(0.439)	**(0.000)**	**(0.020)**	(0.510)
Edu. Spending	0.004	0.015	0.003	0.001	0.004	0.015	0.003	0.001
	(0.916)	(0.151)	(0.710)	(0.907)	(0.911)	(0.136)	(0.700)	(0.892)
Health Spending	0.067	0.003	0.002	0.024	0.067	0.003	0.002	0.024
	(0.220)	(0.819)	(0.819)	(0.145)	(0.245)	(0.761)	(0.753)	(0.188)
Govt. Stab	0.029	-0.014	-0.005	0.001	0.029	-0.014	-0.005	0.001
	(0.251)	(0.505)	(0.683)	(0.886)	(0.293)	(0.407)	(0.695)	(0.907)
Inflation (log)	0.052	**0.036****	0.019	0.008	0.052	**0.036****	0.019	0.008
	(0.260)	**(0.016)**	(0.218)	(0.796)	(0.340)	**(0.020)**	(0.223)	(0.848)
Credit (log)	0.027	0.019	0.026	**0.081***	0.027	0.019	0.026	**0.081*****
	(0.721)	(0.476)	(0.196)	**(0.056)**	(0.729)	(0.460)	(0.198)	**(0.007)**
FDI	-0.037	**0.019****	**0.010***	-0.002	-0.037	**0.019*****	**0.010*****	-0.002
	(0.305)	**(0.012)**	**(0.063)**	(0.659)	(0.365)	**(0.001)**	**(0.000)**	(0.669)
Remittances	0.014	0.005	**0.005****	-0.002	0.014	0.005	0.005**	-0.002
	(0.172)	(0.124)	**(0.033)**	(0.582)	(0.197)	(0.100)	(0.035)	(0.512)
Foreign Aid	**-0.011****	**-0.016*****	**-0.014*****	-0.005	**-0.011***	**-0.016*****	**-0.014*****	-0.005
	(0.042)	**(0.000)**	**(0.000)**	(0.275)	**(0.069)**	**(0.000)**	**(0.000)**	(0.138)
Rule of Law	**-0.097***	-0.002	0.009	0.017	**-0.097***	-0.002	0.009	0.017
	(0.061)	(0.834)	(0.362)	(0.413)	**(0.057)**	(0.807)	(0.338)	(0.339)
Bureaucracy	**0.059***	**0.041***	**0.060*****	**0.062****	**0.059****	**0.041****	**0.060*****	**0.062*****
	(0.084)	**(0.059)**	**(0.006)**	**(0.026)**	**(0.047)**	**(0.015)**	**(0.003)**	**(0.005)**
Adjusted R²	0.658	0.823	0.693	0.517	0.658	0.823	0.693	0.517
Fisher	**4.664****	**15.95*****	**10.52*****	**4.435*****	**6.407*****	**25.80*****	**28.297*****	**8.019*****
Observations	20	60	43	33	20	60	43	33

*,**,**: significance levels of 10%, 5% and 1% respectively. Edu: Education. FDI: Foreign Direct Investment. Gov't: Government. Log: logarithm. 90-94: 1990-1994. 95-99: 1995-1999. 00-04: 2000-2004. 05-11: 2005-2011. Edu: Education. Gov't: Government. FDI: Foreign Direct Investment.

Table 2: Baseline contemporary determinants (HAC SE OLS)

	Regions					Income Levels				Resources		Fragility		Performances			Full
	SSA	MENA	AP	CEE	LA	LIC	MIC	LMIC	UMIC	RR	RP	Frag	NFrag	Hope	Cont	Best	Sample
Constant	0.029 (0.610)	0.353 (0.153)	0.080 (0.720)	nsa	0.710*** (0.000)	-0.022 (0.804)	0.396*** (0.006)	0.345* (0.053)	0.129 (0.346)	-0.028 (0.833-)	0.225*** (0.000)	nsa	0.133 (0.163)	0.085 (0.295)	0.536*** (0.000)	0.651*** (0.000)	0.137 (0.141)
Edu. Spending	0.016** (0.014)	-0.0004 (0.978)	0.015 (0.699)		-0.008* (0.055)	0.014** (0.029)	-0.010 (0.146)	-0.014 (0.106)	-0.035 (0.129)	-0.010 (0.376)	0.0008 (0.901)		-0.001 (0.846)	0.012 (0.070)	0.017*** (0.000)	-0.014** (0.032)	-0.0006 (0.920)
Health Spending	0.001 (0.818)	0.0307 (0.113)	0.073 (0.225)		0.012* (0.060)	0.007 (0.382)	0.015 (0.102)	0.020 (0.141)	0.015** (0.025)	0.030 (0.215)	0.014** (0.049)		0.019** (0.013)	-0.0006 (0.879)	0.022** (0.016)	0.013 (0.131)	0.019** (0.011)
Govt. Stab	0.023*** (0.000)	-0.009 (0.579)	0.04** (0.013)		-0.006** (0.030)	0.017*** (0.000)	0.001 (0.841)	0.004 (0.683)	0.014 (0.423)	0.014 (0.275)	0.007 (0.111)		0.012* (0.053)	0.024*** (0.000)	0.014** (0.012)	0.001 (0.804)	0.012** (0.048)
Inflation (log)	0.030*** (0.000)	-0.004 (0.869)	0.094** (0.019)		-0.003 (0.337)	0.029*** (0.009)	0.019* (0.092)	0.023 (0.152)	0.033 (0.112)	-0.014 (0.478)	0.029*** (0.000)		0.023** (0.032)	0.025*** (0.002)	-0.018 (0.144)	-0.003 (0.555)	0.023** (0.022)
Credit (log)	0.036*** (0.002)	0.155** (0.037)	-0.027 (0.544)		-0.014 (0.458)	0.058*** (0.001)	0.043 (0.116)	0.068* (0.077)	0.040 (0.229)	0.118*** (0.000)	0.041*** (0.007)		0.058*** (0.000)	0.041*** (0.000)	-0.027** (0.019)	0.011 (0.535)	0.058*** (0.000)
FDI	0.0004 (0.863)	0.011 (0.203)	-0.017 (0.199)		0.006*** (0.002)	0.001 (0.779)	0.008*** (0.001)	0.006** (0.026)	0.010 (0.209)	0.0007 (0.861)	0.003 (0.381)		0.006** (0.046)	-0.002 (0.343)	0.006** (0.015)	0.008** (0.012)	0.005* (0.067)
Remittances	0.004 (0.135)	-0.000 (0.994)	-0.004 (0.283)		-0.003*** (0.003)	0.008** (0.025)	0.0001 (0.925)	-0.001 (0.689)	0.024* (0.097)	0.007 (0.143)	0.003* (0.080)		0.002 (0.362)	0.008*** (0.001)	0.005*** (0.000)	-0.001 (0.203)	0.002 (0.266)
Foreign Aid	-0.006*** (0.000)	-0.022 (0.207)	0.027** (0.054)		-0.005 (0.118)	-0.006*** (0.000)	-0.006 (0.123)	-0.008* (0.072)	-0.031* (0.090)	-0.014*** (0.001)	-0.009*** (0.000)		-0.009*** (0.000)	-0.005*** (0.000)	-0.002 (0.141)	-0.004 (0.283)	-0.009*** (0.000)
Rule of Law	0.007 (0.444)	-0.013 (0.280)	-0.001 (0.962)		-0.001 (0.828)	0.014 (0.241)	-0.0003 (0.966)	-0.003 (0.700)	-0.008 (0.564)	0.028 (0.150)	-0.001 (0.778)		-0.002 (0.736)	-0.015*** (0.003)	-0.021*** (0.000)	0.007 (0.413)	-0.001 (0.809)
Bureaucracy	0.036*** (0.000)	-0.122 (0.183)	0.034 (0.347)		0.053*** (0.000)	0.037*** (0.001)	0.028 (0.150)	0.010 (0.662)	0.134*** (0.006)	0.044* (0.051)	0.048*** (0.000)		0.056*** (0.000)	0.031**** (0.003)	0.013 (0.242)	0.001 (0.932)	0.051*** (0.000)
Adjusted R²	0.741	0.152	0.547		0.776	0.711	0.275	0.165	0.477	0.726	0.730		0.690	0.707	0.751	0.185	0.688
Fisher	19.055***	1.270	0.945		8.659***	16.778***	3.396***	1.990*	2.098	11.61***	24.60***		28.16***	14.29***	7.353***	2.139**	29.23***
Hauman test	17.015** (0.074)	n.s.a	nsa		nsa	59.82*** (0.000)	27.31*** (0.000)	16.837 (0.206)	nsa	327.9*** (0.000)	82.17*** (0.000)		90.45*** (0.000)	50.04*** (0.000)	nsa	24.86** (0.024)	93.72*** (0.000)
Countries	23	7	7	9	21	30	22	8		19	32		47	19	9	23	51
Observations	64	16	18	23	65	64	51	13		41	88		123	56	22	51	129

*,**,**: significance levels of 10%, 5% and 1% respectively. 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 SE: Heteroscedasticity and Autocorrelation Consistent Standard Errors. n.sa: not specifically applicable due to shortage in degrees of freedom (matrix is not positive definite). Log: logarithm.

Table 3: Baseline non-contemporary determinants (HAC SE OLS)

	Regions					Income Levels				Resources		Fragility		Performances			Full Sample
	SSA	MENA	AP	CEE	LA	LIC	MIC	LMIC	UMIC	RR	RP	Frag	NFrag	Hope	Cont	Best	
Constant	0.070	-1.318	-0.754	nsa	0.713***	0.014	0.495***	0.382**	0.570***	-0.110	0.330***	nsa	0.222**	0.07****	0.712***	0.599***	0.217**
	(0.269)	(0.174)	(0.123)		(0.000)	(0.892)	(0.000)	(0.031)	(0.003)	(0.553)	(0.000)		(0.022)	(0.000)	(0.000)	(0.000)	(0.017)
Edu. Spending(-1)	0.027***	0.079	0.162		-0.017**	0.022**	-0.002	-0.010	-0.044***	-0.018	0.007		0.0040	0.025***	0.007	-0.015*	0.004
	(0.000)	(0.107)	(0.151)		(0.016)	(0.027)	(0.647)	(0.232)	(0.001)	(0.286)	(0.286)		(0.570)	(0.005)	(0.598)	(0.052)	(0.538)
Health Spending(-1)	-0.008	-0.037	1.227*		0.021**	-0.000	0.009	0.019	0.018***	0.055*	0.007		0.015*	0.000	0.002	0.016	0.015*
	(0.206)	(0.247)	(0.097)		(0.023)	(0.991)	(0.267)	(0.180)	(0.002)	(0.074)	(0.225)		(0.055)	(0.983)	(0.707)	(0.122)	(0.051)
Govt. Stab(-1)	0.021***	0.068	0.082*		-0.001	0.02***	-0.008	-0.0001	-0.026***	0.025*	0.003		0.011**	0.024***	0.007	0.005	0.011**
	(0.000)	(0.286)	(0.052)		(0.854)	(0.000)	(0.415)	(0.992)	(0.006)	(0.097)	(0.542)		(0.042)	(0.000)	(0.235)	(0.553)	(0.049)
Inflation (log)(-1)	0.014**	0.053	-0.256		-0.007	0.015	0.020**	0.023*	-0.002**	0.006	0.023***		0.023***	0.017**	-0.062	-0.0003	0.024***
	(0.038)	(0.183)	(0.163)		(0.182)	(0.187)	(0.034)	(0.079)	(0.043)	(0.737)	(0.001)		(0.006)	(0.051)	(0.148)	(0.947)	(0.004)
Credit (log)(-1)	0.038**	-0.037	-0.107		0.022	0.065***	0.050**	0.096***	0.064***	0.135***	0.038**		0.050***	0.056***	0.015	0.016	0.051***
	(0.027)	(0.609)	(0.486)		(0.315)	(0.002)	(0.040)	(0.002)	(0.002)	(0.002)	(0.040)		(0.002)	(0.000)	(0.692)	(0.466)	(0.001)
FDI(-1)	0.009	0.074*	-0.370*		0.001	0.004	0.013**	0.002	0.025***	-0.004	0.017***		0.011**	-0.002	-0.002	0.009	0.010**
	(0.124)	(0.082)	(0.085)		(0.754)	(0.538)	(0.012)	(0.631)	(0.002)	(0.651)	(0.001)		(0.034)	(0.667)	(0.630)	(0.115)	(0.036)
Remittances(-1)	-0.002	-0.017	-0.041		-0.005***	0.003	0.003	0.001	-0.006**	0.005	0.002		0.002	0.006*	-0.004	-0.001	0.002
	(0.530)	(0.185)	(0.117)		(0.004)	(0.560)	(0.172)	(0.657)	(0.018)	(0.125)	(0.198)		(0.254)	(0.071)	(0.638)	(0.418)	(0.208)
Foreign Aid(-1)	-0.003***	0.030	0.09**		-0.005	-0.004*	-0.014**	-0.013*	0.023**	-0.012	-0.01***		-0.009***	-0.004**	0.008	-0.003	-0.009***
	(0.009)	(0.383)	(0.024)		(0.235)	(0.061)	(0.031)	(0.050)	(0.011)	(0.057)	(0.000)		(0.000)	(0.015)	(0.283)	(0.629)	(0.000)
Rule of Law(-1)	0.008	-0.021*	0.020		-0.024*	0.010	-0.001	-0.014	0.002*	0.015	-0.005		-0.005	-0.014*	-0.023**	0.003	-0.004
	(0.451)	(0.080)	(0.409)		(0.059)	(0.476)	(0.868)	(0.107)	(0.064)	(0.491)	(0.450)		(0.442)	(0.074)	(0.046)	(0.692)	(0.542)
Bureaucracy (-1)	0.026**	0.593	0.061		0.032**	0.021	0.008	-0.014	0.092***	0.017	0.036***		0.036***	0.019	-0.012	0.009	0.035***
	(0.010)	(0.109)	(0.096)		(0.039)	(0.200)	(0.656)	(0.426)	(0.002)	(0.536)	(0.007)		(0.005)	(0.145)	(0.395)	(0.561)	(0.003)
Adjusted R²	0.705	0.371	0.406		0.494	0.560	0.350	0.273	0.999	0.695	0.730		0.683	0.573	0.494	0.186	0.684
Fisher	11.797***	1.651	1.820		2.663	6.608***	3.697***	2.432**	4845***	7.393***	18.91***		20.83***	6.245***	2.269	1.937*	21.58***
Hauman test	33.154***	nsa	nsa		nsa	45.26***	4.728**	26.9***	nsa	132.8***	112.8***		85.15***	31.52***	nsa	20.39***	89.62***
	(0.000)					(0.000)	(0.029)	(0.007)		(0.000)	(0.000)		(0.000)	(0.001)		(0.000)	(0.000)
Countries	21	6	6		9	19	28	20	8	16	31		45	17	8	22	47
Observations	46	12	13		18	45	51	39	12	29	67		93	40	14	42	96

*,**,**: significance levels of 10%, 5% and 1% respectively. 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 SE: Heteroscedasticity and Autocorrelation Consistent Standard Errors. n.sa: not specifically applicable due to shortage in degrees of freedom (matrix is not positive definite). Log: logarithm.

Table 4: Contemporary determinants (HAC SE Panel Fixed effects)

	Regions					Income Levels				Resources		Fragility		Performances			Full Sample
	SSA	MENA	AP	CEE	LA	LIC	MIC	LMIC	UMIC	RR	RP	Frag	NFrag	Hope	Cont	Best	
Constant	0.392*** (0.000)	nsa	0.425 (0.142)	nsa	0.168 (0.146)	0.425*** (0.000)	0.618*** (0.000)	0.591*** (0.000)	nsa	0.521*** (0.000)	0.465*** (0.000)	nsa	0.484*** (0.000)	0.384*** (0.000)	0.582*** (0.000)	0.794*** (0.000)	0.485*** (0.000)
Edu. Spending	0.002 (0.742)		0.033 (0.681)		-0.063** (0.018)	0.004 (0.430)	-0.004 (0.361)	-0.003 (0.556)		-0.004 (0.408)	0.009** (0.050)		0.003 (0.484)	0.005 (0.236)	0.015 (0.369)	0.009* (0.052)	0.002 (0.496)
Health Spending	-0.005 (0.512)		0.031 (0.418)		-0.081* (0.061)	-0.005 (0.362)	0.031 (0.103)	0.029 (0.162)		0.046** (0.027)	-0.004 (0.481)		0.001 (0.81)	-0.015** (0.013)	0.072** (0.012)	-0.024 (0.141)	0.0003 (0.952)
Govt. Stab	0.0045 (0.504)		-0.006 (0.388)		0.0005 (0.624)	0.006 (0.331)	-0.005 (0.305)	-0.009** (0.022)		-0.001 (0.848)	0.003 (0.363)		0.008** (0.026)	-0.003 (0.400)	0.027 (0.010)	-0.0003 (0.932)	0.007** (0.031)
Inflation(log)	0.009 (0.552)		-0.039 (0.215)		0.057** (0.030)	0.008 (0.547)	-0.001 (0.793)	-0.012 (0.187)		-0.016 (0.271)	0.005 (0.483)		0.005 (0.481)	0.012 (0.494)	0.063 (0.120)	-0.002 (0.333)	0.004 (0.503)
Credit(log)	-0.027 (0.103)		-0.0003 (0.994)		0.203** (0.032)	-0.038 (0.003)	0.003 (0.888)	0.029 (0.233)		0.0003 (0.988)	-0.019* (0.085)		-0.021* (0.085)	-0.013 (0.479)	-0.080 (0.100)	-0.043** (0.027)	-0.021* (0.081)
FDI	-0.001 (0.662)		0.004 (0.799)		0.006** (0.045)	-0.004 (0.176)	0.003 (0.117)	0.002 (0.187)		0.003* (0.073)	-0.0006 (0.847)		0.002 (0.401)	-0.000 (0.981)	0.005** (0.027)	0.004** (0.038)	0.002 (0.352)
Remittances	-0.004* (0.099)		0.013 (0.252)		-0.003 (0.144)	-0.005 (0.026)	-0.0006 (0.432)	-0.001 (0.201)		0.001 (0.799)	-0.002*** (0.007)		-0.002* (0.080)	-0.002 (0.288)	-0.013* (0.068)	-0.002 (0.186)	-0.002* (0.055)
Foreign Aid	-0.0004 (0.710)		0.003 (0.777)		-0.006** (0.047)	-0.0004 (0.748)	0.001 (0.300)	0.002 (0.267)		-0.003 (0.125)	-0.0009 (0.443)		0.0001 (0.846)	-0.0003 (0.710)	-0.001** (0.034)	-0.005*** (0.009)	-0.000 (0.966)
Rule of Law	0.013 (0.173)		0.024 (0.310)		-0.157** (0.017)	0.014 (0.044)	0.001 (0.795)	-0.003 (0.664)		0.006 (0.416)	0.013** (0.011)		0.008 (0.135)	0.005 (0.500)	-0.125** (0.012)	0.013** (0.025)	0.008 (0.109)
Bureaucracy	0.026** (0.048)		0.049 (0.371)		0.458** (0.020)	0.030 (0.001)	-0.016 (0.238)	-0.023* (0.055)		-0.024** (0.018)	0.034*** (0.000)		0.018** (0.014)	0.023* (0.094)	0.141** (0.045)	0.026** (0.018)	0.018** (0.012)
Time effects	Yes	No	Yes		Yes	Yes	Yes			Yes	Yes		Yes	Yes	No	Yes	Yes
Within R²	0.817	0.957	0.998		0.865	0.831	0.878			0.922	0.818		0.795	0.875	0.969	0.867	0.794
Fisher	17.40***	9.169	123.22*		33.88***	20.24***	23.51***			58.20***	41.13***		51.34***	19.51***	9.307**	18.15***	49.63***
Countries	23	7	9		21	30	22			19	32		47	19	9	23	51
Observations	64	18	23		65	64	51			41	88		123	56	22	51	129

*,**,**: significance levels of 10%, 5% and 1% respectively. 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 SE: Heteroscedasticity and Autocorrelation Consistent Standard Errors. n.sa: not specifically applicable due to shortage in degrees of freedom (matrix is not positive definite). Log: logarithm.

Table 5: Non-contemporary determinants (HAC SE Panel Fixed effects)

	Regions					Income Levels				Resources		Fragility		Performances			Full
	SSA	MENA	AP	CEE	LA	LIC	MIC	LMIC	UMIC	RR	RP	Frag	NFrag	Hope	Cont	Best	Sample
Constant	**0.389*****	nsa	nsa	nsa	nsa	**0.406*****	**0.643*****	**0.912*****	nsa	2.019	**0.458*****	nsa	**0.561*****	**0.31*****	nsa	**0.646*****	**0.513*****
	(0.000)					**(0.000)**	**(0.000)**	**(0.001)**		(0.124)	**(0.000)**		**(0.000)**	**(0.000)**		**(0.000)**	**(0.000)**
Edu. Spending(-1)	**0.019*****					**0.015****	0.001	**0.015***		-0.008	**0.016*****		**0.011****	**0.019*****		-0.002	**0.011*****
	(0.003)					**(0.011)**	(0.742)	**(0.060)**		(0.422)	**(0.000)**		**(0.011)**	**(0.005)**		(0.677	**(0.006)**
Health Spending(-1)	0.002					-0.000	0.020	-0.001		0.267	0.003		0.003	-0.0005		0.027	0.004
	(0.680)					(0.997)	(0.187)	(0.942)		(0.118)	(0.410)		(0.487)	(0.923)		(0.174)	(0.400)
Govt. Stab(-1)	-0.007					0.002	-0.001	0.003		-0.060	0.006		0.006	-0.005		-0.004	0.006
	(0.392)					(0.747)	(0.736)	(0.590)		(0.122)	(0.183)		(0.135)	(0.445)		(0.549)	(0.130)
Inflation(-1)(log)	-0.004					-0.002	**-0.009*****	-0.001		0.297	-0.0009		-0.003	-0.005		-0.006	-0.002
	(0.751)					(0.845)	**(0.005)**	(0.945)		(0.119)	(0.850)		(0.512)	(0.764)		(0.064)	(0.552)
Credit(-1)(log)	-0.016					-0.021	-0.002	-0.116		-0.671	0.0003		-0.013	0.015		0.029	-0.014
	(0.454)					(0.260)	(0.914)	(0.210)		(0.160)	(0.984)		(0.407)	(0.474)		(0.221)	(0.361)
FDI(-1)	0.005					0.012	-0.005	-0.0004		0.028	**0.009***		0.0009	0.006		-0.0002	0.0008
	(0.378)					(0.107)	(0.054)	(0.875)		(0.208)	**(0.092)**		(0.807)	(0.348)		(0.928)	(0.826)
Remittances(-1)	**-0.007****					**-0.006****	0.001	-0.0003		-0.115	-0.003		-0.002	-0.002		0.001	-0.002
	(0.032)					**(0.048)**	(0.262)	(0.881)		(0.101)	(0.171)		(0.383)	(0.541)		(0.318)	(0.271)
Foreign Aid(-1)	**0.005*****					**0.005*****	0.009	**0.007***		-0.044	**0.002****		**0.002***	**0.004*****		0.005	**0.003***
	(0.003)					**(0.002)**	(0.080)	**(0.093)**		(0.156)	**(0.045)**		**(0.078)**	**(0.007)**		(0.190)	**(0.068)**
Rule of Law(-1)	**0.024***					0.007	0.010	0.027		0.140	**0.011***		0.012	0.006		0.003	0.011
	(0.057)					(0.478)	(0.204)	(0.192)		(0.142)	**(0.093)**		(0.163)	(0.634)		(0.430)	(0.176)
Bureaucracy (-1)	-0.008					-0.002	-0.016	0.009		0.015	0.005		-0.007	0.0002		**-0.020***	-0.006
	(0.538)					(0.849)	(0.147)	(0.587)		(0.527)	(0.384)		(0.474)	(0.980)		**(0.065)**	(0.504)
Time effects	Yes					Yes	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Within R²	0.877					0.901	0.781	0.758		0.937	0.872		0.766	0.879		0.898	0.765
Fisher	**18.19*****					**29.16*****	**17.77*****	**12.33*****		**16.2*****	**52.42*****		**42.25*****	**13.18*****		**18.69*****	**41.97*****
Countries	21					19	28	20		16	31		45	17		22	47
Observations	46					45	51	39		29	67		93	40		42	96

*,**,**: significance levels of 10%, 5% and 1% respectively. 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 SE: Heteroscedasticity and Autocorrelation Consistent Standard Errors. n.sa: not specifically applicable due to shortage in degrees of freedom (matrix is not positive definite). Log: logarithm.

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

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.

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