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DEVELOPMENT STRATEGY AND GOVERNANCE DIVISION

June 2006

DSGD Discussion Paper No. 34

Moving Up and Moving Down: A New Way of Examining Country Growth Dynamics

Marc Rockmore and Xiaobo Zhang

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ABSTRACT

Do the countries which grow share the same features as those which decline? How can some countries achieve such long-term sustainable growth while others fail so badly? This paper builds on the emerging literature on growth asymmetries by examining movement across income categories in the World Development Reports over a significant period of time. The results confirm the existence of asymmetries and find that the factors which are correlated with movement upwards or downwards are markedly different. Evidence is presented which suggests that growth episodes share some common features while economic collapse may occur for a broader range of reasons.

MOVING UP AND MOVING DOWN: A NEW WAY OF EXAMINING COUNTRY GROWTH DYNAMICS

Marc Rockmore and Xiaobo Zhang¹

I. INTRODUCTION

Despite numerous development policies and programs, relatively few countries have changed income categories over the past several decades. While a small number of countries, like the Asian Tigers, became examples of outstanding success, many more countries, notably Sub-Saharan African countries, have declined or stagnated. Why are some countries able to achieve sustainable growth while others fail so badly?

An emerging body of literature argues that the answer lies in growth asymmetries. (Hausman *et al.* 2005; Jones and Olken, 2005a; Jerzmanowski, forthcoming) This contrasts with the large body of literature examining growth correlates which assumes that all countries lie on the same contour (*inter alia* Barro, 1991; Levine and Renelt, 1992; King and Levine, 1993; Sala-i-Martin, 1997). Therefore, variables are assumed to have the same impact on all the countries no matter the stage of development and regardless of the direction of movement. By looking at growth episodes, the new work finds both that growth accelerations and decelerations have different determinants and that there are asymmetries between growth accelerations and collapses.

In general, however, these growth episodes have been defined on a window of several years in a rather ad hoc way. This paper builds on the emerging literature on growth asymmetries by examining movement across income categories in the World Development Reports (WDR) over a longer period of time. In particular, we investigate the correlates with changes in membership between different income categories from 1981 to 2002. These changes capture both the successful stories of sustainable growth and the declines in wealth over a rather long period. The use of these pre-determined

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categories allows us to avoid some of the arbitrariness in defining growth episodes such as in Hausman *et al.* (2005).

Based upon a literature review of the growth empirics, variables for geography, institutions, trade, conflict, and the initial stage of development are used in the analysis. A logistic model is employed to estimate the correlates of moving up and moving down with a rather good fit. By estimating separate models for movement in either direction, different variables can emerge as correlates for movement upwards or downwards.² The results confirm the existence of asymmetries in the growth process. We find that factors which are correlated with movement upwards or downwards are markedly different. The model also better predicts movement upwards. Our framework suggests that this may be because growth episodes share some common features while economic collapse may occur for a wide range of reasons (“the weakest link”).

While not significant in all of the robustness check, one exception to the asymmetry may be the average ratio of trade to GDP which is generally significantly positive in both directions. This is likely due to the volatility associated with increased trade and the ability of countries to cope with shocks. While integration with the world market brings about tremendous opportunities and potential for growth, it may also exposes the domestic economy to global shocks. For countries which rely on natural resources or other primary goods as the major exports, the volatility of raw material prices in the international market may translate into growth volatility.

The remainder of the paper is structured as follows. Section II reviews the growth literature and presents the framework and the hypotheses underlying the paper. Data is described in Section III. Section IV presents the results while section V concludes.

² This differs from more traditional cross-country regressions which assume that the same variables effect movement in either direction and that this effect is constant regardless of the direction of movement.

II. LITERATURE REVIEW, FRAMEWORK AND HYPOTHESES

There exists an extensive literature which seeks to explain why certain countries develop while others stagnate or decline. This literature has proposed a wide variety of factors (and associated variables) without necessarily agreeing on any broad set of causes or proxies. Rodrik *et al.* (2004) argue that “accumulation and technological change [the traditional focus of growth theory] are at best proximate causes of economic growth... [which in turn raises the question]: why did some societies manage to accumulate and innovate more rapidly than other?” The authors offer three broad answers: geography, integration and institutions (“deep” determinants of economic growth in their terminology).

The first type of answer emphasizes the role of geography in explaining both historical and current differences in growth between developed and developing countries. These explanations generally seek to explain the persisting low levels of development in Africa. Gallup *et al.* (1999) and Bloom and Sachs (1998) argue that geographic factors have been historically underappreciated by economists. For instance, tropical countries tend to be disadvantaged with regards to agricultural productivity due to the length of growing seasons, sunlight, and other factors (Bloom and Sachs, 1998). Technological advances in agriculture historically do not transfer well across ecological zones thereby creating a divide across the North-South axis (Diamond, 1997). Additionally, tropical areas have higher disease burdens as diseases such as malaria are primarily associated with these regions. Moreover, Gallup *et al.* (1999) highlight the role of geography in determining trade by arguing that landlocked economies face higher transportation costs. Landlocked countries, particularly those in Sub-Saharan Africa, are impeded due to the distance from markets and the relatively lower levels of transportation infrastructure in the region.

Some other authors (Collier, 1998; Udry, 1998), however, are not as convinced by the determinant role for geography as outlined above. Udry (1998) disagrees that geography is the primary impediment to Africa’s growth noting that market failure must

play a central role in any explanation. Further, he claims that, to a certain extent, geography is endogenous. For instance, the low agricultural productivity and the lack of a “true” Green Revolution are not solely the result of disadvantageous geography, but rather a combination of geography with “systemic failures of insurance and capital markets.” Additionally, while acknowledging the importance of technology, Udry (1998) maintains that Bloom and Sachs (1998) have overemphasized the point.

A second strand of the literature argues for the importance of integration into the world economy and of openness to trade. Using a mixture of historical review, case studies and econometric analysis, Sachs and Warner (1995), Dollar (1992) and Srinivasan and Bhagwati (1999) argue that for a variety of reasons, both direct and indirect, openness to trade may result in higher growth. For instance, it can lead to increased competition, greater specialization in markets and reduced rent-seeking. Furthermore, as countries become more open, the pressure of international competition results in the government taking further and complementary reforms.

Rodriguez and Rodrik (2000), however, criticize much of this literature on methodological grounds arguing that the openness variables are improperly measured. Likewise, Alesina and Wacziarg (1998) maintain that the extent of the openness to trade may be partially determined by other factors such as country size. Further, when controlling for other factors such as geography and institutions, Rodrik *et al.*, (2004) find that trade does not have a direct effect on per capita GDP. Moreover, while openness to trade and institutions impact one another, quantitatively, institutions have a stronger effect on trade than vice versa.

Institutions have also been advanced as a major determinant for growth. North (1990) argues for the importance of institutions and of the protection of property rights in particular. Advocates note the role of property rights and the rule of law in investments in physical and human capital as well as in the allocation of resources to their most efficient uses (Acemoglu *et al.*, forthcoming). This view also encompasses questions such as whether colonial legacies have lasting effects through, for instance, their legal heritage (La Porta *et al.* 1997, 1998, and 1999). More recently, Acemoglu *et al.* (2001) argue that

colonial institutions shape current institutions particularly with respect to property rights and constraints on the executive. In other words, institutions have a long-term impact on development. Taken to its extreme, growth is path-dependent upon institutions.

Fukuyama (2006) argues that (formal) institutions have a less central role than is currently assumed in the literature and that institutions do not necessarily result in path dependencies for development. In particular, he differentiates between formal and informal institutions. Formal institutions are embedded within informal institutions, norms and traditions which determine their effectiveness. He notes that leadership plays an important role in determining country outcomes by transcending institutional frameworks. This view is supported by the empirical work of Jones and Olken (2005b). While the death of a political leader leads to changes in growth rates, this occurs only in autocratic as opposed to democratic regimes. Moreover, this effect increases as the autocratic leaders have fewer constraints on their power.

In addition to the three broad categories, political and social stability have also been argued to be necessary pre-conditions for economic growth. Although examples of instability and conflict holding back or reversing economic growth and development exist across the world (for example, Afghanistan, Colombia, Liberia, Lebanon, and Haiti), it is pandemic in certain regions. Miguel *et al.* (2004) note that in the 1980s and 1990s, 29 of the 43 countries in Sub-Saharan Africa had episodes of civil conflict. In turn, Fosu (2002) finds a link between political instability (different types of coups) and economic growth in Sub-Saharan Africa, while Murdoch and Sandler (2002) and Collier (1999) establish the strong negative impact of civil wars on economic growth. Additionally, research has linked agricultural productivity and the effectiveness of public investment, two key determinants of development, to the levels of conflict and security (Fulginiti *et al.*, 2004; Zhang, 2004).

While the list can be expanded as a result of a more exhaustive review, no clear consensus has emerged as to which factor is the key to economic growth. Adelman (2001) argues that the search for “silver bullets” strategies that work in all countries is futile. Rather, individual countries face different and often specific constraints. The

possibility that different stages of development may have different drivers of growth and constraints is another reason to doubt the existence of “silver bullets”. For example, Adelman and Morris (1967) show that different development stages face different constraints and challenges. Wan (2004) further argue that the underlying growth mechanisms differ across stages of development. Similarly, Galor *et al.* (2003) propose a model where land abundance is beneficial at early stages of development but later becomes an impediment for further development.

While the above literature helps to identify key determinants of growth, there is also a large body of literature emphasizing the important role of coordination among different factors in preventing growth failures. In the development process, crises are often the result of coordination failures among sectors, agents, regions, or policies. For instance, Bardhan (1984) analyses the coordination failure among various parties in India which resulted in their inability to bear the short run costs inherent of long-run reforms. For rural development in particular, Kydd and Dorward (2003) stress the importance of coordination among different economic actors in addressing problems in rural areas.

Ades and Chua (1997) emphasize the negative impact of regional instability on growth. They further note that policies which resolve territorial disputes may have large beneficial effects for other countries not directly involved in the dispute. In other words, there exist strong spatial effects from instability. Even if the domestic policies are well chosen and appropriate, having the misfortune to be located in a region with conflict greatly reduces the chances for growth.

Kremer (1993) perhaps best illustrates this idea using the analogy of the space shuttle *Challenger* which exploded due to the failure of one of its thousands of components, the o-ring. Using the joint production of skilled and unskilled labors as an example, he shows that total productivity depends upon the performance of each individual. While he considers production functions, this may also be applied to growth more generally. Similar to a space shuttle, economic growth may depend on many different factors working in tandem.

This brief review of the coordination failure literature suggests that growth is an outcome of the coordination of many factors, including those well argued in the growth literature as shown in the above section. Therefore, we tend to observe that the successful stories share similar features which consist of a few core factors. However, deficiencies in a larger set of factors may prevent growth and even cause economic collapse. For example, while institutions may play a critical in economic growth, they cannot function properly under certain conditions (political instability, civil conflict, poor leadership, etc.). Therefore, we draw the following hypothesis to test:

Hypothesis I: There exist asymmetries in the growth process. Upwards and downwards movement have different correlates.

Recent research has found asymmetric determinants of growth. Hausman *et al.* (2005) were the first to follow Pritchett's injunction (2000) to look at growth episodes. The authors find that accelerations are generally correlated with increases in investment and trade, real exchange rate depreciations, and political-regime changes. They find, however, different determinants for unsustained and sustained growth accelerations. While external shocks produced unsustained growth accelerations, economic reform seemed to lead to more sustained growth episodes. Despite the significance of several predictors, the authors conclude that growth episodes are highly unpredictable. For instance, most political changes and economic reforms do not lead to growth accelerations and most growth accelerations occur without any political changes or economic reforms. This may be because the accelerations are the result of small incremental changes which are not captured by the variables (Rodrik, 2004).

Expanding the focus from just growth accelerations, Jones and Olken (2005a) look at both growth accelerations and decelerations. Using structural break theory to identify growth transitions, the authors find different determinants for the growth episodes. Growth accelerations were caused by increases in productivity. In turn, these seem to be the result of the re-allocation of labor across sectors. Accelerations are also linked with growth in trade. Conversely, growth decelerations are due to changes in investment, increased monetary instability and sometimes internal conflict. While

Hausman *et al.* (2005) and Jones and Olken (2005a) differ in some specific determinants, they coincide with regards to the asymmetries in the growth process.

Since growth episodes are often not sustained, it is important to look at growth dynamics over longer periods of time. However, previous research has tended to focus on a window of several years. In this paper, we will draw variables based on the above literature review and make use of the exogenously determined income categories in the World Development Reports to examine growth dynamics over a long time horizon.³ We test for the existence of asymmetries using a logistic model and compare the results of growth and decline episodes.⁴ Differing sets of correlates for the growth and decline episodes will provide evidence of growth asymmetries.⁵ If growth collapses occur for a wide range of reasons, econometrically, it would be more difficult to pinpoint the exact correlates or causes of collapses than for successful episodes. Due to the difficulties in testing this directly, we look for indirect evidence which supports the second hypothesis:

Hypothesis II: For a small set of factors, models for the episodes of economic growth should perform better than for those of declines.

Our methodological approach is similar to that Hausman *et al.* (2005) who use a probit to look at the drivers of growth episodes.⁶ Jones and Olken's (2005a) approach is based upon the standard neoclassical production function. While this approach has merits, since we follow Rodrik *et al.* (2004) in looking at the so-called "deep" determinants and since Jones and Olken (2005a) look at physical and human capital accumulation, we do not use this approach.

³ The number of variables is also limited due to difficulties in obtaining cross-country data for the base year, 1981 and to the limited number of observations in our sample.

⁴ Pritchett (2000) outlines the main reasons for not using average growth rates or similar approaches to look at growth.

⁵ Since we are unable to show causality, the paper only refers to correlates as opposed to drivers of growth. Despite this inability, the results are quite suggestive as the levels are from 1981 and are correlated with the growth performance over the subsequent 22 year period.

⁶ The results presented are essentially unchanged if a probit model is used.

III. SOURCES OF DATA

Economic growth and decline is measured using movement across the income categories in the World Development Reports (WDR). Countries are classified as having growth if they are in a higher income category in the 2004 WDR as opposed to the 1983 WDR. By looking at movement across the 22 year period, we are able to capture growth patterns over a fairly long period and to ignore shorter unsustained episodes of growth and deceleration.

The 1983 WDR is chosen since it is the first WDR to use the now standard classification of low, lower-middle, upper-middle, and high income albeit with two additional categories (high-income oil exporters and East European non-market economies) which we reclassify into the four categories based upon per capita Gross National Income (GNI) levels.⁷ In total, the 1983 WDR contains information on 125 countries with populations of more than 1 million and, in a technical appendix, summary information on a further 34 less populous countries.

Measuring growth in this manner has several advantages and disadvantages. One major advantage is that we do not define growth episodes ourselves. Since the categories were determined by the World Bank in 1983, they reflect the beliefs that were current at the time. Current attempts to reclassify countries upon criteria may be influenced, consciously or otherwise, by biases such as the knowledge of the actual growth experiences of the countries.

The primary disadvantage of using income categories is that country movement within categories may be lost. Despite having the same growth rate, countries in the middle of an income group are less likely to change categories than those closer to the boundaries of the category. In spite of these shortcomings, looking at the movement across categories reveals useful information.

⁷ To be precise, the 1983 WDR has low income, lower-middle, and upper-middle income and industrial market economies categories. In the paper, the last category is assumed to represent high income.

Table 1 shows the average, maximum and minimum growth rates by income category and by type of movement.⁸ In general, the averages broadly confirm what is expected. Countries which move up have higher average growth rates than those which move down. Furthermore, higher income groups have higher growth rates. The concern expressed above is visible in the Min and Max columns as some countries experience high rates of GNI per capita change but do not move across income categories. Table 2 lists the countries with the highest and lowest growth averages by income group and movement category. The rank column shows the distance from the country with the highest GNI per capita in the income category in 1983 with higher scores indicating closer proximity to the top. Some countries, such as Syria, experience decelerations but do not change income categories. Syria began at the top of the income category in 1983 and moved down within the category. While we recognize the loss of information regarding movement within but not across income groups, this will be inherent of any criteria using movement across groups. We try to address this by adding a variable reflecting the relative position of the country within the income category in the subsequent regression analyses.

Due to the size of domestic markets, infrastructure costs and other factors, smaller countries may face different constraints and opportunities than larger countries.⁹ Based upon this, three samples are created. The first sample is limited to the countries in the WDR tables, that is countries with populations of 1 million or more. Since the cutoff point is arbitrary, countries with populations of 0.9 million are added to create a second sample. The third sample contains all of the countries in the WDR and the technical appendix. Because of data constraints, a number of countries are subsequently dropped. The three resultant samples have 108, 110 and 120 countries respectively (a list of the countries by sample can be found in Appendix I).

⁸ Since countries in the low income category cannot move down, no values are reported, the same for countries in the high income category and “move up”. Since data is missing for a number of countries, this data is only suggestive. For instance, there was no data available for the two countries in the high income category which move down. The total number of countries used to generate these numbers is listed in the “total” column. The data is drawn from the 2004 World Development Indicators.

⁹ For example, see Spolaore and Wacziarg (2005) for country size, openness and trade.

Table 1. Summary Growth Statistics for Gross National Income per Capita by Income Category and Movement, 1981-2002

		Average Growth	Min	Max	# of Countries
All	LI	8.5	-81.1	336.4	24
	LMI	26.7	-61.5	189.0	33
	UMI	95.6	-44.3	422.6	22
	HI	93.2	-52.7	217.6	19
Do not move	LI	-13.9	-81.1	62.1	22
	LMI	47.4	-37.6	189.0	19
	UMI	50.4	-44.3	141.6	10
	HI	101.3	-22.8	217.6	18
Move up	LI	255.3	174.2	336.4	2
	LMI	149.0	123.0	175.0	2
	UMI	232.9	112.0	422.6	7
	HI	-	-	-	-
Move down	LI	-	-	-	-
	LMI	-26.6	-61.5	24.6	12
	UMI	-6.1	-29.5	36.1	5
	HI	-52.7	-52.7	-52.7	1

Table 2. Countries with Lowest and Highest Growth Rates of Gross National Income per Capita by Category, 1981-2002

		Average Growth	Group	Rank	% Change
Do not move	Min	-	LI	-	-
	Max	India	LI	43.9	62.1
	Min	Syrian Arab Repub.	LMI	94.0	-37.6
	Max	El Salvador	LMI	28.0	189.0
	Min	Gabon	UMI	75.0	-44.3
	Max	Hungary	UMI	25.0	141.6
	Min	Canada	HI	38.5	88.6
	Max	-	HI	-	-
Move up	Min	Sri Lanka	LI	61.0	174.2
	Max	China	LI	53.7	336.4
	Min	Botswana	LMI	60.0	123.0
	Max	Costa Rica	LMI	86.0	175.0
	Min	Greece	UMI	78.1	112.0
	Max	Korea, Repub	UMI	0.0	422.6
	Min	Nigeria	LMI	50.0	-61.5
	Max	Indonesia	LMI	10.0	24.6
Move down	Min	Iran	UMI	3.1	-29.5
	Max	Brazil	UMI	31.3	36.1
	Min	Saudi Arabia	HI	-52.7	-52.7
	Max	Saudi Arabia	HI	-52.7	-52.7

Within each sample, two different sub-samples are created. One sub-sample consists of countries which move up or could have moved up, that is countries which are not in the high income category. Since there is no further group above the high income category, these countries are omitted from the comparison group for the Up sample. Similarly, the second sub-sample consists of countries which move down or which could have moved down. Table 3 provides the summary statistics for the countries changing categories. Table 4 lists those countries by group.

Table 3. Movement Across Income Categories, by Samples

Position of and Movement of Countries between 1983 and 2004 – Sample 1					
Position in 1983 WDR	Position in 2004 WDR				Total
	LI	LMI	UMI	HI	
Low Income (LI)	29	2	0	0	31
Lower-Middle Income (LMI)	15	19	1	0	35
Upper-Middle Income (UMI)	0	5	9	7	21
High Income (HI)	0	0	2	19	21
Up	-	2	1	7	10
Down	15	5	2	-	22
Total	44	26	12	25	108

Position of and Movement of Countries between 1983 and 2004 – Sample 2					
Position in 1983 WDR	Position in 2004 WDR				Total
	LI	LMI	UMI	HI	
Low Income (LI)	29	2	0	0	31
Lower-Middle Income (LMI)	15	19	3	0	37
Upper-Middle Income (UMI)	0	5	9	7	21
High Income (HI)	0	0	2	19	21
Up	-	2	3	7	10
Down	15	5	2	-	22
Total	44	26	14	25	110

Position of and Movement of Countries between 1983 and 2004 – Sample 3					
Position in 1983 WDR	Position in 2004 WDR				Total
	LI	LMI	UMI	HI	
Low Income (LI)	33	2	0	0	35
Lower-Middle Income (LMI)	15	21	3	0	39
Upper-Middle Income (UMI)	0	6	10	8	24
High Income (HI)	0	0	2	20	22
Up	-	2	3	8	13
Down	15	6	2	-	23
Total	48	29	15	28	120

Table 4. Countries Moving Across Income Categories

Low Income		Lower-Middle Income		Upper-Middle Income		High Income	
Up	Down	Up	Down	Up	Down	Up	Down
China		Botswana	Angola	Cyprus	Algeria		Libya
Sri Lanka		Costa Rica	Cameroon	Greece	Brazil		Saudi Arabia
		Mauritius	Congo, Rep.	Ireland	Fiji		
			Indonesia	Israel	Iran		
			Ivory Coast	Korea, Rep.	Romania		
			Kenya	Portugal	S.h Africa		
			Lesotho	Singapore			
			Mauritania	Spain			
			Mongolia				
			Nicaragua				
			Nigeria				
			Papua New Guinea				
			Senegal				
			Zambia				
			Zimbabwe				

Regardless of the sample, between the two periods, roughly 30% of the countries change income categories. In general, countries moved away from middle-income status as countries in the lower-middle income group moved downwards while those in the upper-middle group moved upwards. As a result, the share of the middle income countries fell from approximately 50 percent to close to 35 percent. In the high income group, only two countries, Libya and Saudi Arabia, moved downward and an additional two low income countries, China and Sri Lanka, moved up to lower-middle income status.

Tropics and the percent of land within 100 kilometers of the coast are used to measure geography. Tropical countries are expected to be both in lower income categories and to have lower growth. Countries are classified as tropical if the absolute value of their latitude is less than or equal to 23. This variable is drawn from Global Development Network Growth database at the New York University Development Research Institute. Proximity to the coast is important for both agro-ecological reasons

and the lowering of transportation costs and consequent increasing of the potential for trade.¹⁰ The data is drawn from the Center for International Earth Science Information Network at Columbia.

Based upon the literature review, we choose generally accepted proxies for each of the “deep” determinants and for the shocks and stage of development: stage of development (initial income group, proximity to highest income level in income group), geography (tropical, percent of land within 100 kilometers of coast), trade (average trade/GDP ratio for 1981-1985). While other proxies exist, the choice and number of variable is constrained by the number of observations and the availability of cross-country data for 1981.

A variable for the constraints on the executive branch will be used to proxy for institutional effects. Since the 1983 WDR is based upon data from 1981, this year is also used for this variable. The variable is drawn from the Polity IV dataset with values of -66, -77, and -88 recoded in the same manner as Polity IV recodes the polity2 variable. Acemoglu *et al.* (2001) suggests that the more constraints on the executive, the higher the growth.

While the literature debates the importance of openness to trade, the actual effects of trade may be just as important. Regardless of their openness to trade, certain countries, for reasons such as country size or remoteness, will always have low levels of trade. Furthermore, using actual levels of trade measures the importance that trade *does* have as opposed to that which trade *could* have. For these reasons and due to data constraints and methodological issues in measuring openness to trade (*inter alia* Rodrik and Rodriguez, 2001), we use actual levels of trade.¹¹

¹⁰ For a small number of countries, such as Ethiopia, the percent of land within 100 kilometers of the coast changes over time. Due to the lack of alternative data and to the extreme rareness of this occurrence, this possibility is consciously ignored.

¹¹ Due to the limited sample size, we do not present the results measuring openness to trade using Lee’s (1993) composite measure of tariff restrictions in the 1980s. While the limited sample size makes it difficult to draw conclusions, the results are broadly consistent with asymmetric correlates of growth. A different approach would be to use gravity-equation trade model (Frankel and Romer, 1999). The lack of pair-wise trade data for 1981 prevents us from using this variable in this paper.

The actual effects of trade are measured using the average ratio of trade to GDP between 1981 and 1985.¹² The data is drawn from the Penn World Table 6.1 (PWT). Where possible, missing data is filled using the World Development Indicators 2004 (WDI). While the PWT and the WDI data are not identical, the differences are generally quite small and the WDI data is used only for a handful of cases.

Variables for the stage of development are also created using the initial income categories as a proxy. Additionally, a variable is created reflecting the proximity of the country to the country with the highest income in the income category.¹³ As countries are closer to the threshold to the next highest income level, the variable takes a higher value. The variable reflects the intuition that countries which are closer to the threshold between income categories are more likely to change categories than those which are further away.

In order to better understand the effects of shocks on the development process, a variable for the number of internal conflicts between 1981 and 2002 is also created. The Armed Conflict database from the Centre for the Study of Civil War at the International Peace Research Institute can be separated, among other ways, by location and by intensity.¹⁴ The intensity reflects the number of deaths as the result of politically motivated violence. As Miguel *et al.* (2004) argue, the higher threshold may exclude events which are significant in smaller countries. Further, the lower threshold may better capture domestic instability which adversely affects economic development through the effectiveness of investments or other factors. Consequently, we use the lowest intensity threshold and only look at internal conflicts.¹⁵

¹² We use the average trade/GDP ratio from the early period of 1981 to 1985 to partly reduce the potential endogeneity problem as the growth is measured in a longer and later period of 1983-2004. Therefore the causality from growth on trade is minimized.

¹³ The per capita GNI is missing for some of the countries in the 1983 WDR. When these countries can be situated relative to other countries, they are included in the sample and their income is assumed to be the average of the country immediately above and below them. Countries can be situated when the country immediately above and below them have non-missing GNI values.

¹⁴ Location: within country or not; intensity: (1) more than 25 deaths in year; (2) more than 25 deaths in year and more than 1,000 deaths total conflict history; (3) more than 1,000 deaths in year.

¹⁵ The significance of the conflict variable depends on the threshold used. When the lowest threshold is used (25 deaths per year and any number of cumulative deaths), then the variable is significant. The other

A potential problem of this threshold is that events such as the Omagh bombing by the Real IRA in 1999 which killed 28 people are sufficient to result in a year being counted as having conflict. The Armed Conflict database does not provide information on the total number of deaths apart from the 25 and 1,000 death thresholds. While the Correlates of War (COW) database does provide information on the number of deaths, there is only one observation per conflict and it therefore does not provide a measure of intensity by year. Furthermore, Sambanis' (2002) detailed critique of the COW data leads us to not use it to test the robustness of the results.

Table 5 compares the means of the variables used in the regression analysis for countries moving up and down. The results show systematic differences between the two sub-samples for many variables. The percentage of land within 100 kilometer from the coast for the Up group is high at 75.6 as compared to the 19.3 for the Down group. Constraints on executive in 1981 are significantly higher for countries moving up. While the comparison provides a basic idea of the difference between the groups, a more rigorous multivariate analysis is needed to quantify the impact of each individual factor on the growth dynamics.

Table 5. Variable Means by Movement Category

Variable	Move Down	Move Up	P Value
Low-middle income (0,1)	0.65	0.15	0.003
Upper-middle income (0,1)	0.26	0.69	0.011
Proximity to next group	34.23	67.87	0.000
Tropical (0,1)	0.65	0.38	0.128
% land <100 km from coast	19.25	75.62	0.000
Avg Trade/GDP, 1981-85	69.69	99.17	0.150
Constraint on Executive, 1981	2.98	5.54	0.001
# years of conflict, 1981-2002	5.09	3.92	0.635

thresholds result in the variable being insignificant more often than not with varying p-values. The location of the conflict does not affect the significance of the variable in any of the logistics. The odds-ratios and level of significance of the other variables are broadly unchanged regardless of the specification.

IV. ESTIMATION OF GROWTH DYNAMICS

Using the variables outlined in the previous section, we estimate a logistic model with robust estimators. The results are presented in Table 6 where rows 1-3 show the odds ratio for the Up model while rows 4-6 show the same for the Down sample. Rows 1 and 4 use the first sample (population of at least 1 million), rows 2 and 5 use the second sample (population of at least 0.9 million), while rows 3 and 6 use the third sample (all countries). Since the first sample is more than ten percent smaller than the third sample, the different samples provide a check on the robustness of the results.

Table 6. Logistic Model for Movement Upwards and Downwards, by Sub-Sample

	(1)	(2)	(3)	(4)	(5)	(6)
	Up	Up	Up	Down	Down	Down
Lower-middle inc	0.000**	0.019**	0.186	1.765	1.415	1.404
	(2.39)	(2.05)	(1.23)	(0.39)	(0.25)	(0.25)
Upper-middle inc	0.000**	0.037	0.283	1.233	1.140	1.720
	(2.31)	(1.64)	(0.88)	(0.15)	(0.09)	(0.43)
Proximity next group	1.068**	1.016	1.011	0.964**	0.965***	0.964***
	(1.99)	(1.13)	(1.00)	(2.53)	(2.81)	(2.96)
Tropical	0.000***	0.026*	0.032**	4.185	3.493	3.489
	(2.91)	(1.81)	(2.14)	(1.51)	(1.38)	(1.57)
% land <100km	1.125***	1.033	1.031	0.948***	0.953***	0.954***
	(3.02)	(1.22)	(1.23)	(3.74)	(3.74)	(3.96)
Trade/GDP	1.066	1.034***	1.018***	1.015***	1.012**	1.008
	(1.60)	(2.90)	(2.93)	(2.84)	(2.43)	(1.28)
Constraints on exec	3.953***	2.169***	1.916***	0.806	0.775	0.905
	(3.52)	(3.59)	(3.59)	(0.91)	(1.06)	(0.51)
# of Conflicts	0.710*	0.885	0.956	1.074	1.082*	1.087*
	(1.90)	(1.43)	(0.48)	(1.47)	(1.70)	(1.70)
Observations	87	89	98	77	79	85
Pseudo R ²	0.747	0.572	0.551	0.460	0.441	0.354

Note: Robust z statistics in parentheses;

** significant at 10% level; ** significant at 5%; *** significant at 1%.*

In general, the models fit reasonably well with relatively higher pseudo R^2 s for the Up sub-samples (0.55-0.75) than for the Down sub-samples (0.35-0.46). As a comparison, our model, which examines a longer period of time, has better predictive power in explaining the country dynamics than Hausman *et al.* (2005). In their probit models, the pseudo R^2 values remain low (between 0.05 and 0.08). Consequently, they note that the models do a relatively poor job of predicting accelerations and argue that “growth accelerations are caused predominately by idiosyncratic, and often small-scale, changes” which presumably cannot be captured by the model or by the variables. By improving the pseudo R^2 s to between 0.37-0.75, we show that, to a certain extent, models are able to predict movement across income groups over longer periods of time.

There are several reasons why the Up model performs better than the Down model. For instance, the variables which are correlated with movement downwards may simply not have been selected for the model. Our framework presents an alternative explanation: while a relatively small number of “deep” determinants are related to upwards movement, a failure in some small set of a large number of areas (macroeconomic, political and social stability, weather, policy, etc.) may lead to downwards movement. This remains a topic for future research since our model does not allow for this to be empirically verified.

The relatively high fit of the model is worth underlining since it uses only fixed factors or variables for the early 1980s. This result is similar to the findings of Temple and Johnson (1998) who find that the social capability index of Adelman and Morris (1967) and its constituent parts predict subsequent growth performances. Likewise, while the values of the variables in the model – as well as many other policies and factors– change over the 22 year period, the measures from 1981 are nonetheless highly correlated with subsequent movement.

Despite the varying samples, the coefficients and significance of variables are relatively constant. Within the Up sub-samples, tropics and constraints of the executive are consistently highly significant with fairly stable coefficients while trade is significant at the 1% level in two of three of the samples with similar coefficients. Variables for the

stage of development are also significant in samples excluding smaller countries. Within the Down sub-samples, the number of significant variables is lower. The percent of land within 100 kilometers of the coast and the initial starting position of a country are consistently significant. Trade is also significant in samples of larger countries (samples 1 and 2). Likewise, conflict appears to increase the likelihood of moving down income categories.

The geographic variable of land within 100 kilometers of the coast is consistently negatively correlated (and with almost identical odds-ratios) with downwards mobility and is at times positively correlated with movement upwards. This likely reflects the ability of countries to participate in the increasingly global trade. Countries without access to the coast and which are far from major trading areas face potentially high infrastructure costs and may be constrained by the inability of neighbors to provide adequate infrastructure.

Countries with domestic instability and violence were more likely to move downwards and, to lesser extent, less prone to move upwards. Each additional year of instability, decreases the likelihood of moving up by 5-20 percent and increases that of moving downwards by roughly 7 to 9 percent. The results suggest that stability is a key pre-condition for long-term growth and that instability may be closely related to economic collapses. While not correlated with downwards movement, constraints on the executive strongly increase the probability of moving up income categories.

The results confirm the existence of asymmetries in the growth process of a broad cross section of countries across a sustained period of time. These findings corroborate those of Jones and Olken (2005a) and, to a lesser extent, those of Hausman *et al.* (2005). We find not only that the coefficients of variables vary between the Up and Down sample, but also that different variables are significant thereby confirming hypothesis I. Further, the ratio of trade to GDP is generally significantly correlated with positive movement in either direction. This has strong consequences for growth literature which assumes that variables have the same impact regardless of the direction of movement. As a result of the asymmetry, much of this work may be misleading and may therefore need

to be revisited. Beyond looking at average growth rates, incidents of acceleration and deceleration may need to be considered separately.

As previously noted, the differing samples of countries provide a measure of the robustness of the results. In general, as evidenced in Table 6, the results are very comparable especially for the main results. There are clear asymmetries between the Up and Down sub-samples regardless of the set of countries used. Further, the Up model consistently outperforms the Down model. While the significance of some variables changes based upon the sample, most variables are significant in at least two of three samples and the coefficients are relatively stable.

In order to further test the robustness, we use a varying coefficients model with two groups: countries with negative GNI per capita growth rates over the period and those with positive rates. The varying coefficient model essentially adds interaction terms between the two groups and each of the independent variables. The results reported in Table 7 show the total effect (the variable plus the interaction term) of each independent variable for each group, (1) for countries moving down and (2) for countries moving up. The standard errors are adjusted to reflect the total effect. The results largely support those from the logistic model. The coefficients from the up model strongly differ from those in the down model providing further clear evidence of asymmetries. Additionally, compared with the countries moving down, more of the variables for the countries moving up are significant. While this does not show that the second hypothesis is true, it is suggestive of it.

The different specifications support the two principle findings of the paper: the asymmetry in the correlates of growth and the greater predictive power of the Up model. The former implies that the underlying determinants of growth and declines may be different. Successful counties may share similar characteristics, while economic collapses, however, may result from a wider range of problems. In some sense, every economic decline is a unique story.

Table 7. Varying Coefficient Model for Percent Growth GNI per Capita, 1981-2002

	(1) Down	(2) Up
Log 1981 GNI per cap	-0.772 (0.08)	-20.322** (2.03)
Tropical	1.126 (0.04)	-52.697*** (2.69)
% land <100km	0.018 (0.04)	0.568** (2.31)
Trade/GDP	0.127 (0.36)	0.399** (2.21)
Constraints on exec	0.950 (0.17)	9.350** (2.01)
Conflict	0.346 (0.16)	-1.184** (2.14)
Constant	-229.615** (2.14)	190.575*** (2.66)
Observations	98	
R ²	0.612	

Note: The symbols *, **, and *** stands for significant at 10%; ** 5%, and 1%, respectively.

V. CONCLUSION

By looking at country dynamics across income categories, as defined in the World Development Reports (WDR), over a significant period of time, we find clear evidence of growth asymmetry. Factors correlated with movement upwards or downwards tend to differ. Our literature review and framework suggests that in part, this may be because countries which experience growth share several common features. Conversely, a great number of problems may lead to economic collapse (“weakest link”). In some sense, the framework suggests that long run growth is like marriage. Successful marriages share a small set of similar qualities but marriages may fail for a wide variety of reasons.

The core findings regarding asymmetry suggest, with serious implications for the growth literature, that a single equation cannot be used to explain economic growth and decline. In general, research has tended to examine success stories to understand why they are successful. Our findings suggest that more research is needed to identify better correlates or determinants of economic decline. In practical terms, economic policies which prevent economic collapse may not lead to economic growth. Consequently, when governments are constrained policies which avoid economic collapse, such as through conditionality, they may also be constrained to avoid great economic growth. Alternately, while these plans may provide the basis for economic growth (by “getting the fundamentals right”), they may only provide the platform; further policies may be needed to launch the growth.

While a narrow set of “deep” determinant variables may be associated with growth, one should be cautious that this does not necessarily imply similar policies for all countries. Many countries have tried to copy the policies of successful countries and have subsequently learned that policy is not necessarily transferable. Rather, these drivers of growth must be adapted to local conditions and the “right” policy in one country may not resemble that in another country. For instance, China has had tremendous economic success despite not following traditional policy recommendations. Few, however, would suggest that China’s strategy is applicable to most countries.

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APPENDIX I. SAMPLE MEMBERSHIP

Sample 1				
<i>Algeria</i>	Denmark	Japan	Pakistan	Trinidad and Tobago
<i>Angola</i>	Dominican Repub	Jordan	Panama	Tunisia
Argentina	Ecuador	<i>Kenya</i>	<i>Papua New Guinea</i>	Turkey
Australia	Egypt	Korea, Repub	Paraguay	Uganda
Austria	El Salvador	Kuwait	Peru	United Arab Emirates
Bangladesh	Ethiopia	Lao	Philippines	United Kingdom
Belgium	Finland	<i>Lesotho</i>	Portugal	United States
Benin	France	<i>Libya</i>	<i>Romania</i>	Uruguay
Bhutan	German, Fed Repub.	Madagascar	Rwanda	Venezuela
Bolivia	Ghana	Malawi	<i>Saudi Arabia</i>	Zaire
<i>Brazil</i>	Greece	Malaysia	<i>Senegal</i>	<i>Zambia</i>
Burkina Faso	Guatemala	Mali	Sierra Leone	<i>Zimbabwe</i>
Burma	Guinea	<i>Mauritania</i>	Singapore	
Burundi	Haiti	Mexico	Somalia	
<i>Cameroon</i>	Honduras	<i>Mongolia</i>	<i>South Africa</i>	
Canada	Hungary	Morocco	Spain	
CAR	India	Mozambique	Sri Lanka	
Chad	<i>Indonesia</i>	Nepal	Sudan	
Chile	<i>Iran</i>	Netherlands	Sweden	
China	Ireland	New Zealand	Switzerland	
Columbia	Israel	<i>Nicaragua</i>	Syrian Arab Repub.	
<i>Congo, Repub</i>	Italy	Niger	Tanzania	
Costa Rica	<i>Ivory Coast</i>	<i>Nigeria</i>	Thailand	
Cuba	Jamaica	Norway	Togo	

Sample 2				
<i>Algeria</i>	Denmark	Japan	Pakistan	Trinidad and Tobago
<i>Angola</i>	Dominican Repub	Jordan	Panama	Tunisia
Argentina	Ecuador	<i>Kenya</i>	<i>Papua New Guinea</i>	Turkey
Australia	Egypt	Korea, Repub	Paraguay	Uganda
Austria	El Salvador	Kuwait	Peru	United Arab Emirates
Bangladesh	Ethiopia	Lao	Philippines	United Kingdom
Belgium	Finland	<i>Lesotho</i>	Portugal	United States
Benin	France	<i>Libya</i>	<i>Romania</i>	Uruguay
Bhutan	German, Fed Repub.	Madagascar	Rwanda	Venezuela
Bolivia	Ghana	Malawi	<i>Saudi Arabia</i>	Zaire
<i>Brazil</i>	Greece	Malaysia	<i>Senegal</i>	<i>Zambia</i>
Burkina Faso	Guatemala	Mali	Sierra Leone	<i>Zimbabwe</i>
Burma	Guinea	<i>Mauritania</i>	Singapore	Botswana
Burundi	Haiti	Mexico	Somalia	Mauritius
<i>Cameroon</i>	Honduras	<i>Mongolia</i>	<i>South Africa</i>	
Canada	Hungary	Morocco	Spain	

CAR	India	Mozambique	Sri Lanka
Chad	<i>Indonesia</i>	Nepal	Sudan
Chile	<i>Iran</i>	Netherlands	Sweden
China	Ireland	New Zealand	Switzerland
Columbia	Israel	<i>Nicaragua</i>	Syrian Arab Repub.
<i>Congo, Repub</i>	Italy	Niger	Tanzania
Costa Rica	<i>Ivory Coast</i>	<i>Nigeria</i>	Thailand
Cuba	Jamaica	Norway	Togo

Sample 3

<i>Algeria</i>	Denmark	Japan	Pakistan	Trinidad and Tobago
<i>Angola</i>	Dominican Repub	Jordan	Panama	Tunisia
Argentina	Ecuador	<i>Kenya</i>	<i>Papua New Guinea</i>	Turkey
Australia	Egypt	Korea, Repub	Paraguay	Uganda
Austria	El Salvador	Kuwait	Peru	United Arab Emirates
Bangladesh	Ethiopia	Lao	Philippines	United Kingdom
Belgium	Finland	<i>Lesotho</i>	Portugal	United States
Benin	France	<i>Libya</i>	<i>Romania</i>	Uruguay
Bhutan	German, Fed Repub.	Madagascar	Rwanda	Venezuela
Bolivia	Ghana	Malawi	<i>Saudi Arabia</i>	Zaire
<i>Brazil</i>	Greece	Malaysia	<i>Senegal</i>	<i>Zambia</i>
Burkina Faso	Guatemala	Mali	Sierra Leone	<i>Zimbabwe</i>
Burma	Guinea	<i>Mauritania</i>	Singapore	Botswana
Burundi	Haiti	Mexico	Somalia	Mauritius
<i>Cameroon</i>	Honduras	<i>Mongolia</i>	<i>South Africa</i>	Bahrain
Canada	Hungary	Morocco	Spain	Comoros
CAR	India	Mozambique	Sri Lanka	Cyprus
Chad	<i>Indonesia</i>	Nepal	Sudan	Equatorial Guinea
Chile	<i>Iran</i>	Netherlands	Sweden	<i>Fiji</i>
China	Ireland	New Zealand	Switzerland	Gabon
Columbia	Israel	<i>Nicaragua</i>	Syrian Arab Repub.	Gambia
<i>Congo, Repub</i>	Italy	Niger	Tanzania	Guinea-Bissau
Costa Rica	<i>Ivory Coast</i>	<i>Nigeria</i>	Thailand	Guyana
Cuba	Jamaica	Norway	Togo	Ireland
				Swaziland

Note: Move up in bold
Move down italicized

APPENDIX II. COUNTRY LEVEL DATA AND GROUP AVERAGES

Country Name	Movement	Income Group	Tropical	# of Internal Disturbances	Avg Trade/GDP Ratio, 1976-80	Constraints on Executive	Percent of Land Within 100km of Coast	Proximity to Top of Income Category
Bhutan	-	Lower	0	0	59.7	2	0.0	2.4
Lao	-	Lower	1	5	11.5	3	7.3	4.9
Chad	-	Lower	1	20	35.8	1	0.0	7.3
Bangladesh	-	Lower	0	12	21.7	2	71.1	9.8
Ethiopia	-	Lower	1	18	26.8	3	2.1	12.2
Nepal	-	Lower	0	7	31.2	3	0.0	14.6
Equatorial Guinea	-	Lower	1	0	100.5	1	63.8	17.1
Burma	-	Lower	1	22	18.5	2	30.7	22.0
Mali	-	Lower	1	3	49.2	1	0.0	24.4
Guinea-Bissau	-	Lower	1	2	53.3	3	85.5	26.8
Malawi	-	Lower	1	0	53.3	1	0.0	29.3
Zaire	-	Lower	0	6	39.2	1	0.6	31.7
Uganda	-	Lower	1	20	27.1	4	0.0	34.1
Burundi	-	Lower	1	11	33.8	1	0.0	36.6
Burkina Faso	-	Lower	1	2	42.8	1	0.0	39.0
Rwanda	-	Lower	1	11	32.5	1	0.0	41.5
India	-	Lower	0	22	14.1	7	16.7	43.9
Somalia	-	Lower	1	18	77.0	1	44.1	46.3
Tanzania	-	Lower	1	0	15.7	3	9.6	48.8
Guinea	-	Lower	1	2	70.3	1	14.9	56.1
Haiti	-	Lower	1	2	46.7	1	100.0	58.5
Benin	-	Lower	1	0	69.0	1	10.7	63.4
CAR	-	Lower	1	2	57.5	1	0.0	65.9
Sierra Leone	-	Lower	1	10	22.4	3	49.5	68.3
Comoros	-	Lower	1	2	67.1	3	100.0	70.7
Madagascar	-	Lower	1	0	31.5	3	57.6	73.2
Niger	-	Lower	1	4	53.7	1	0.0	75.6
Pakistan	-	Lower	0	14	33.8	1	11.9	80.5
Mozambique	-	Lower	1	12	27.2	2	30.4	85.4
Gambia	-	Lower	1	1	108.3	5	75.7	87.8
Sudan	-	Lower	1	20	28.4	3	2.9	92.7
Togo	-	Lower	1	2	102.0	1	16.7	95.1
Ghana	-	Lower	1	2	14.2	1	19.4	97.6
Bolivia	-	L-Middle	1	0	49.7	1	0.0	14.0
Honduras	-	L-Middle	1	0	57.6	5	67.3	16.0
Egypt	-	L-Middle	0	6	64.6	3	22.8	26.0
El Salvador	-	L-Middle	1	11	53.7	4	99.5	28.0
Guyana	-	L-Middle	1	0	120.0	1	26.7	30.0

Swaziland	-	L-Middle	0	0	148	1	28.8	34.0
Thailand	-	L-Middle	1	5	49.2	3	29.0	36.0
Philippines	-	L-Middle	1	22	48.5	2	100.0	38.0
Morocco	-	L-Middle	0	9	50.1	2	34.2	46.0
Cuba	-	L-Middle	1	0	78.5	1	100.0	58.0
Guatemala	-	L-Middle	1	15	31	3	42.4	66.0
Peru	-	L-Middle	1	19	37	6	16.9	68.0
Ecuador	-	L-Middle	1	1	44.7	7	38.9	70.0
Jamaica	-	L-Middle	1	0	101.4	7	100.0	72.0
Dominican Repub	-	L-Middle	1	0	47.7	5	99.8	76.0
Columbia	-	L-Middle	1	22	26.2	6	16.2	82.0
Tunisia	-	L-Middle	0	0	80	1	48.2	84.0
Turkey	-	L-Middle	0	19	29.5	1	38.9	90.0
Syrian Arab Repub.	-	L-Middle	0	2	40.2	1	12.6	94.0
Jordan	-	L-Middle	0	0	122.6	1	11.6	96.0
Paraguay	-	L-Middle	0	1	35.9	1	0.0	98.0
Malaysia	-	U-Middle	1	1	108.1	5	79.3	12.5
Panama	-	U-Middle	1	1	79.1	2	100.0	15.6
Hungary	-	U-Middle	0	0	83.8	3	0.0	25.0
Mexico	-	U-Middle	1	2	31.2	3	38.5	34.4
Argentina	-	U-Middle	0	1	15.6	1	12.5	43.8
Chile	-	U-Middle	0	0	46.5	1	69.3	46.9
Uruguay	-	U-Middle	0	0	42.2	3	37.4	53.1
Venezuela	-	U-Middle	1	1	42.3	6	25.3	56.3
Gabon	-	U-Middle	1	0	105.9	1	27.3	75.0
Trinidad and Tobago	-	U-Middle	1	1	71.8	7	100.0	96.9
Italy	-	Upper	0	0	45.6	7	78.7	3.8
New Zealand	-	Upper	0	0	62.4	7	93.5	7.7
Bahrain	-	Upper	0	0	209.8	1	100.0	15.4
United Kingdom	-	Upper	0	12	53.3	7	95.3	19.2
Japan	-	Upper	0	0	26.7	7	96.8	23.1
Austria	-	Upper	0	0	74.4	7	1.4	26.9
Finland	-	Upper	0	0	60.1	7	33.0	30.8
Australia	-	Upper	0	0	32.3	7	21.3	34.6
Canada	-	Upper	0	0	51.5	7	31.1	38.5
Netherlands	-	Upper	0	0	112.2	7	85.5	42.3
Belgium	-	Upper	0	0	137.2	7	48.0	46.2
France	-	Upper	0	0	45.6	5	34.4	50.0
United States	-	Upper	0	4	18.2	7	16.9	57.7
Denmark	-	Upper	0	0	71.2	7	100.0	65.4
German, Fed Repub.	-	Upper	0	0	56.5	7	21.5	69.2
Norway	-	Upper	0	0	78.1	7	80.8	73.1
Sweden	-	Upper	0	0	66.2	7	40.1	76.9
Switzerland	-	Upper	0	0	71.1	7	0.0	84.6
Kuwait	-	Upper	0	2	104.9	3	97.2	88.5
United Arab Emirates	-	Upper	1	0	95.7	3	73.7	92.3
Kenya	down	L-Middle	1	1	53.8	3	9.1	0.0
Senegal	down	L-Middle	1	9	79.7	3	31.4	2.0

Mauritania	down	L-Middle	1	0	109.1	3	5.7	4.0
Indonesia	down	L-Middle	1	18	49.2	2	77.2	10.0
Lesotho	down	L-Middle	0	1	154.3	2	0.0	12.0
Zambia	down	L-Middle	1	0	68.1	1	0.0	18.0
Angola	down	L-Middle	1	22	67	3	12.0	40.0
Papua New Guinea	down	L-Middle	1	7	94.2	7	73.7	42.0
Nicaragua	down	L-Middle	1	9	47.6	2	61.8	48.0
Nigeria	down	L-Middle	1	2	35	7	9.3	50.0
Zimbabwe	down	L-Middle	1	0	41.2	5	0.0	52.0
Cameroon	down	L-Middle	1	2	64.5	2	10.1	54.0
Congo, Repub	down	L-Middle	1	6	105.5	2	4.6	64.0
Ivory Coast	down	L-Middle	1	1	76.5	1	16.9	74.0
Mongolia	down	L-Middle	0	0	92.8	3	0.0	80.0
Iran	down	U-Middle	0	17	24.2	2.5	15.7	3.1
Fiji	down	U-Middle	1	0	92.4	7	52.5	18.8
Algeria	down	U-Middle	0	12	54.4	1	4.4	28.1
Brazil	down	U-Middle	1	0	19.3	1	9.6	31.3
Romania	down	U-Middle	0	1	52.9	2	7.0	40.6
South Africa	down	U-Middle	0	8	51.8	7	19.1	50.0
Libya	down	Upper	0	1	86.2	1	10.1	11.5
Saudi Arabia	down	Upper	0	0	83.2	1	12.7	53.8
China	up	Lower	0	6	15.8	3	6.3	53.7
Sri Lanka	up	Lower	1	19	69.2	5	98.5	61.0
Botswana	up	L-Middle	1	0	104.8	5	0.0	60.0
Mauritius	up	U-Middle	1	0	100.1	7	99.8	78.0
Costa Rica	up	L-Middle	1	0	76.6	7	99.8	86.0
Korea, Repub	up	U-Middle	0	0	69.6	3	92.2	0.0
Portugal	up	U-Middle	0	0	65.9	6	68.2	37.5
Cyprus	up	U-Middle	0	0	114.5	7	100.0	71.9
Greece	up	U-Middle	0	0	48.7	5	95.1	78.1
Israel	up	U-Middle	0	22	105.9	7	86.4	84.4
Ireland	up	U-Middle	0	0	105.9	7	94.1	87.5
Singapore	up	U-Middle	1	0	373.5	3	99.8	90.6
Spain	up	U-Middle	0	4	38.8	7	43.1	93.8
Group*								
Overall			0.56	4.8	64.9	3.6	40.2	48.8
Up			0.38	3.9	99.2	5.5	75.6	67.9
Could have moved up but did not			0.72	6.0	57.1	2.7	31.3	46.7
Down			0.65	5.1	69.7	3.0	19.3	34.2
Could have moved down but did not			0.39	3.0	74.5	4.5	55.7	54.8

*Averages based upon the third sample

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