ADBI Working Paper Series

GROWTH SLOWDOWNS, MIDDLE-INCOME TRAP, AND DEMOGRAPHIC PROFILE IN SOUTH ASIA

S. P. Jayasooriya

No. 736
May 2017

Asian Development Bank Institute

S. P. Jayasooriya is chartered economist (economic policy) at Innovation4Development Consultants.

Suggested citation:

Jayasooriya, S. P. 2017. Growth Slowdowns, Middle-Income Trap, and Demographic Profile in South Asia. ADBI Working Paper 736. Tokyo: Asian Development Bank Institute. Available:https://www.adb.org/publications/growth-slowdowns-middle-income-trap-demographic-profile-south-asia

Please contact the author for information about this paper.

Email: spj0525@gmail.com

Asian Development Bank Institute
Kasumigaseki Building, 8th Floor
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

The middle-income trap (MIT) is a scenario of rapidly growing economies that experience sudden stops and ultimately lead to stagnation at the middle-income level. Economic growth depends on changes in the demographics of a country. Conversely, the demographic change in economic growth has both positive and negative relationships in the literature. Further, testing a neoclassical model of economic growth is not adequately estimated in the field of demographic and growth slowdowns in South Asia. Therefore, the study uses panel data for understanding the structural change in the demographic changes of South Asian economies. The main approach in middle-income trap literature—the growth slowdowns approach—is used in assessing the MIT fitted into the neoclassical model. The unit root test with a structural break is used for identifying the growth slowdowns. Through this specific approach the current paper is devoted to validating the existence of growth slowdown, hence the middle-income trap. Exploiting Eichengreen, Perkins and Shin (2011, 2013) methodology and adjusting it in order to fit for the South Asian countries, this study identifies numerous slowdown episodes from 1960 to 2014. Thus, a probit model with several indicators is examined to identify which specific factors increase or reduce the likelihood of growth slowdown episodes and consequently drive South Asia into stagnation. The determinants of growth slowdown are: significant negative factors, GDP per capita, lagged growth, trade openness, investment share, demographic profile, and FDI. Further, the study revealed that the demographic transition factors are: fertility rate, dependency ratio, young dependency, labor force, demographic profile, and population density.

Keywords: growth slowdown, MIT, demographics, South Asia

JEL Classification: E13, F43, J11, O11, O47

Contents

1. INTRODUCTION

Apprehensions about the "middle-income trap" (MIT) have recently emerged among many middle-income countries that these countries are concerned about the trap at the middle-income level since the existing economic policies that facilitated earlier growth from low income to middle income may not be encountered with the transition phase to the high-income level. Further, middle-income countries intend to set policies that can help those countries to join the league of high-income countries.

Finding a set of appropriate growth-promoting policies is a complicated task since different countries face different institutional, structural, and demographic constraints. This paper introduces the different growth-promoting factors as a set of stylized facts about South Asian countries and about fundamentals that facilitate the transformation from middle-income countries to high-income countries. Focusing on relative income in US GDP, the growth of the South Asian countries has been studied.

Following Pritchett's (2000) and Hausmann, Pritchett and Rodrik (2005), this study intends to identify the instances of rapid but sustained acceleration in economic growth. The literature suggests that growth slowdown tends to be correlated with increases in investment and trade, and with real exchange rate depreciations. Growth accelerations are also correlated with political regime changes and economic reforms. At the same time, growth accelerations are highly unpredictable; the majority of reforms do not lead to growth slowdown. Recent literature analyzes growth slowdowns and their implication for future growth. Eichengreen, Perkins and Shin (2011) construct a sample of cases where fast-growing economies slow down significantly when their per capita income reaches around US$ 17000 in year 2005 constant international prices.

The outline of the remainder of this paper is as follows. Section 2 provides an explanation of the theoretical literature. Section 3 presents the stylized facts on economic growth and demographics in South Asia. Section 4 presents data and the empirical analysis, in particular the estimation model, and the methodology process, and Section 5 presents the estimation of the results and discussion. Section 6 describes avoidance of the middle-income trap. Finally, in Section 7, conclusions are presented.

2. LITERATURE REVIEW

Numerous insights into the MIT lead to ambiguous results regarding policy recommendations in middle-income countries (ADB, 2010). The main idea of solving this issue is to find the literature that supports the identification and pursuing of various approaches. The specific framework for the middle-income trap is defined and examined in terms of the theoretical background, the definition, the determinants, and the policy implications in order to avoid the MIT.

This study identifies two evaluation approaches with respect to Paus's (2014) study. Paus distinguishes two separate groups of scholars. The first group highlights the need for structural change in middle-income countries, and a productive capabilities gap is considered to be a prerequisite in order to achieve a long-lasting and reliable growth pattern. Further, the study illustrates that productive capabilities contribute significantly to sustaining a strong comparative advantage for a country's industrial sector. Later, it

avoids the trap even if rapid slowdown occurs. In Sutton (2005), and in Hausmann and Hidalgo (2010), capabilities are defined as a quality-productivity combination that subsumes human and physical capital, the legal system, and the institutional quality concerning the production process of a particular country. Felipe, Abdon, and Kumar (2012) study the productive capability gap, proxying it through the products exported by middle-income countries. The study examined whether these products are the same for a trapped and a nontrapped country. Moreover, they used indicators of structural transformation and trade to provide insight into the development progress with the exogenous variables. The results of Felipe, Abdon, and Kumar (2012) are straightforward, as they find clear patterns separating trapped and nontrapped countries for all eight indicators. Later on, Paus (2014) identifies the need for middle-income countries to meet global economic standards and follow current globalization paths through innovation and market-wise competition. In other words, a structural change approach absorbs the globalization process rhetoric concerning policy recommendations, and promotes more proactive and growth-targeted policies in order for structural change to be achieved. Nevertheless, very few studies have been dedicated to the MIT exclusively from the globalization phase.

The second, slowdown approach of this study follows growth slowdown and its theoretical framework, which follows the neoclassical model. Therefore the growth slowdown approach tends to examine slowdown determinants such as baseline setup, macroeconomic environment, demographics, trade, and human capital to recommend policies. The main studies representing the research are Eichengreen, Perkins and Shin (2011, 2013) and Robertson and Ye (2013). The growth slowdown approach is aimed at involving the growth of a neoclassical model economy with correlated slowdowns that occur at specific moments in time.

In a seminal study, Aiyar et. al. (2013) follow the Solow growth model using its theoretical predictions even though conditional convergence is not entirely true. They identify growth slowdowns employing a pair of criteria that take the difference between actual and estimated growth. The Solow-Swan model predicts that the income levels of poor economies converge in time with the income of richer countries, as both should have similar saving rates for human and physical capital. Overall, in Aiyar et. al. (2013), an innovative approach is adopted compared to other studies, invalidating the argument about the existence of the trap. Instead, Eichengreen, Perkins and Shin (2011, 2013) follow a more complex method introduced in empirical growth literature by Hausmann, Pritchett and Rodrik (2005). The study of Hausmann, Pritchett and Rodrik (2005) classifies growth accelerations using three criteria. When those criteria are satisfied, a dummy variable is used as the dependent variable. Eichengreen, Perkins and Shin (2011, 2013) follow the aforementioned method to identify growth slowdowns. Though Aiyar, and Mody (2011) and Eichengreen, Perkins and Shin (2011, 2013) treat the slowdown classification by employing different methods and criteria, both investigate the likelihood of several determinants and their impact on the dependent variable. The studies use a probit model to link growth slowdowns with several variables, examined as possible determinants. Strangely, though, the two studies exhibit major differences in the slowdown episodes identified.

Therefore, the standard growth theory—the neoclassical variant—has limited capacity to explain growth slowdowns or the MIT. The augmented Solow model, which narrowly reduces economic growth down to capital accumulation, labor, and productivity growth, predicts a long-term income convergence rate of 2%, which implies that the economy moves to its steady state in about 70 years (Mankiw, Romer, and Weil 1992). The Growth Slowdown approach, which is more accurate than the convergence studies, have assessed the neo-classical model —either explicitly or implicitly—and equated the growth slowdowns directly with the middle-income trap. This allowed the growth slowdown theorists to define precisely when a country that experienced a growth slowdown fell into the trap.

2.1 Demographic Transition

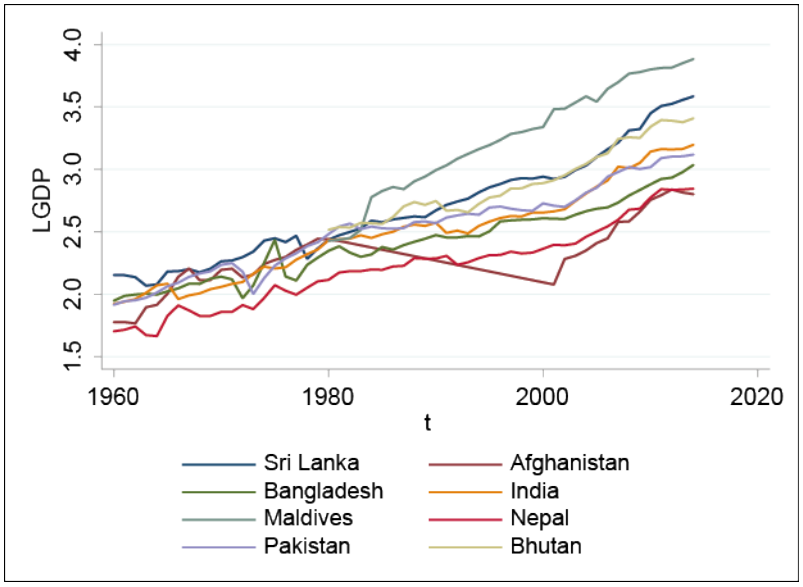
A demographic transition is crucial for building the future blocks of the economy and supporting rapid growth. Aiyar and Mody (2011) discovered that changes in the age structure along with higher labor participation account for a substantial amount of growth acceleration. Bloom and Williamson (1998) specifically attribute the East Asian Miracle largely to this successful transition and reconstruction of the demographic dividend, which, along with trade, became the two main reasons economies grew rapidly and flourished. In other sectors of the economy, demographic changes and characteristics of each specific country are able to withhold growth dynamics. Bloom and Williamson (1998) in their study state that demographic reformation has driven the Asian Tigers upward in growth as the demographic dividend accounts for a large part of their current advanced state.

From a number of literature surveys, numerous demographic variables are considered for the study: demographic profile, fertility, dependency ratio, life expectancy, labor force, young dependency, old dependency, population, and population density. Basic factors in many studies are: fertility rate, and capturing the growth of the domestic workforce by measuring the economic activity of the members of the society. Further, labor force has a very profound role in development economics. A very important demographic variable examined in both Aiyar, and Mody (2011) and Eichengreen, Perkins and Shin (2011, 2013) is age dependency ratio. It reflects the percentile of the population under the age of 15 and over 64 that is financially dependent. Age dependency ratio accounts for a transformation of the working age ratio, while it offers the option to be split into two measures, for young and old ages, respectively. In this study, besides age dependency ratio, demographic profile—the ratio of working to nonworking population—has also been included.

3. STYLIZED FACTS OF ECONOMIC GROWTH AND DEMOGRAPHIC PROFILE IN SOUTH ASIA

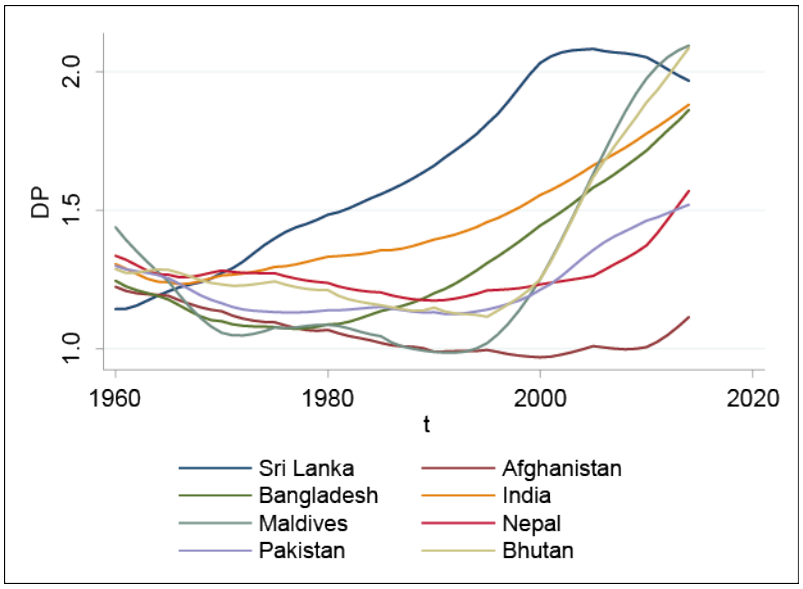
Figure 1 shows the log of GDP growth in South Asian countries over the period 1960 to 2014.

Figure 1: Gross Domestic Product (GDP) of South Asian Countries



Source: Author calculations.

Figure 2: Demographic profile of South Asian countries



Source: Author calculations.

4. DATA AND METHODOLOGY

The data were taken from the PWT 9.0, World Development Indicator (WDI) and Economic Outlook Data of the International Monetary Fund (IMF). The World Bank's growth rate of GDP and GDP per capita based on constant 2011 US dollars are considered for the study.

Due to a lack of multiple unit root tests, the Zivot-Andrews unit root test with a structural break has been used in the study to recognize the structural break of the growth series. Specifically, the presence of the middle-income trap was tested through repeated Zivot-Andrews tests in order to identify structural breaks and consequently identify the points in time where growth slowed down leading to a middle-income trap. According to Robertson and Ye's (2013) methodology, the middle-income trap is a robust phenomenon that fits into theory and models.

The method relates demographic characteristics to economic growth slowdowns on the basis of pooled probit regressions. The binary dependent variables in these regressions are dummy variables, constructed on the basis of data on GDP per capita growth for 1960–2014 from Penn World Table 9.0. These dummy variables have a value of 1 in years that can be identified as growth slowdown years and 0 otherwise. To identify such slowdowns of economic growth, this paper follows the methodology of Eichengreen, Perkins and Shin (2011and 2013) and defines year *t* as a growth slowdown year if the following two conditions are fulfilled:

$$g_{t,t-n} \geq 3.5\%$$

$$g_{t,t+n} - g_{t,t-n} \geq 2\%$$

where $g_{t,t-n}$ is the average annual GDP per capita growth rate between *t–7* and *t*, and $g_{t,t+n}$ is the average annual GDP per capita growth rate between *t* and *t+7*. The comparison of the past seven years with the coming seven years takes a medium-term perspective and is likely to avoid an identification of slowdowns on the basis of business cycle movements.

The analysis of growth slowdowns builds on a symmetrical analysis of growth accelerations by Hausmann, Pritchett, and Rodrik (2005). An episode was identified as a growth slowdown following Hausmann, Pritchett, and Rodrik (set n = 7). The first condition requires that the seven-year average growth rate is 3.5% or greater prior to the slowdown. The second one identifies a growth slowdown with a decline in the seven-year average growth rate of at least 2 percentage points. The third condition limits slowdowns to cases in which per capita GDP is greater than $10,000 in 2011 constant prices. This indicates that the growth slowdowns are not defined in the seven years at the end of the sample, which drop out of the analysis. Eichengreen, Perkins and Shin (2011and 2013), in addition, state that GDP per capita (in 2005 constant PPP US$) should be larger than 10,000, since they intend to identify only middle-income growth traps.

Table 7 (in the Appendix) lists all the slowdowns identified by this approach. In some cases the methodology identifies a string of consecutive years as growth slowdowns. One way of dealing with this is to employ the Zivot-Andrews test for structural breaks to select only one year out of the consecutive years identified. Having a break point, the value of 1 is assigned to three years centered on the year of the growth slowdown. The comparison group consists of the countries that did not experience a growth slowdown in that same year. The sample includes all countries for which the relevant data are available, including countries that have never experienced a growth slowdown. Dropping all data pertaining to years t+2, ... t +7 of the growth slowdown as a way of removing the transition period to which either a 0 or 1 may not be clearly assigned.

The following equation is estimated to determine factors affecting the growth slowdown:

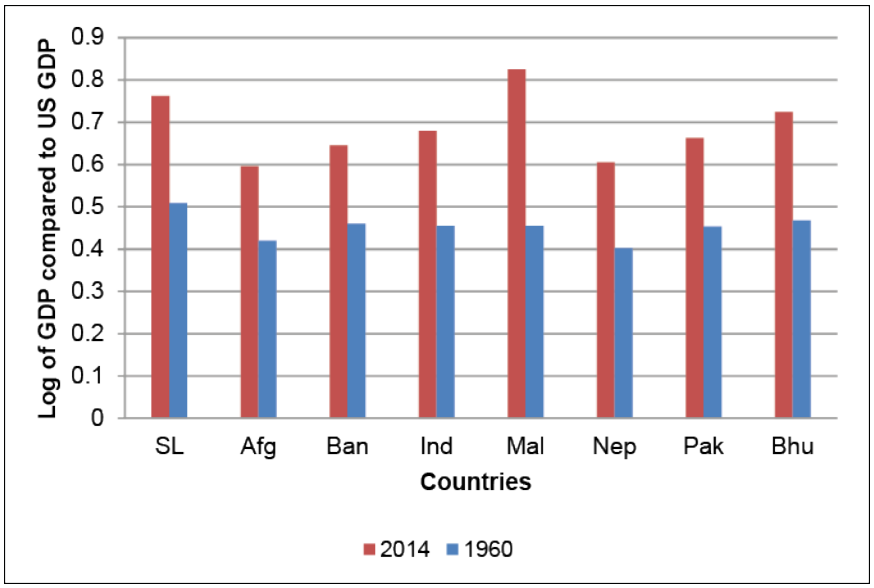
$$\Pr(g\_sdwn = 1) = \Phi(\alpha + \beta X + \gamma D)$$

where *g_sdwn* is the slowdown binary variable (constructed on the basis of economic growth between $t - 7$ and $t + 7$). Φ (.) is the normal cumulative distribution function, X is a vector of control variables, and D is a vector of variables measuring a selection of demographic characteristics. The Xs—control variables—are chosen according to Eichengreen, Perkins and Shin (2011and 2013). Subsequently the probabilities of a country experiencing an economic growth slowdown are likely to depend nonlinearly on the level of economic development in regression control for GDP per capita and its square. Moreover, regression is controlled for the trade openness of a country and human capital index (HCI). Finally, pre-slowdown economic growth is also included as a control variable. Throughout, robust standard errors are reported that take into consideration the panel structure of the probit model.

5. RESULTS AND DISCUSSION

Based on the World Bank classifications, three categories can be identified in South Asia as follows: lower-middle-income countries ($1,026 to $4,035): Bhutan, India, Pakistan, Sri Lanka, Bangladesh; upper-middle-income countries ($4,036 to $12,475): Maldives; and lower-income countries ($1,045 or less): Afghanistan and Nepal.

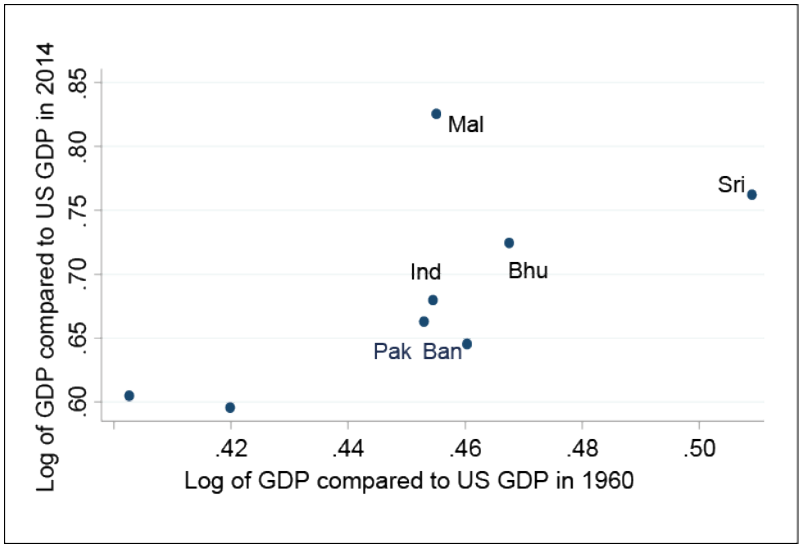
Figure 3: Changes of Income Levels Compared to US GDP in 1960 to 2014



Afg = Afghanistan, Ban = Bangladesh, Bhu = Bhutan, Ind = India, Mal = Maldives, Nep = Nepal, Pak = Pakistan, SL = Sri Lanka.

Source: Author calculations.

Figure 4: Log of GDP of SA countries relative to US GDP from 1960 to 2014



Ban = Bangladesh, Bhu = Bhutan, Ind = India, Mal = Maldives, Pak = Pakistan, Sri = Sri Lanka.

Source: Author calculation.

After identification of the growth slowdown, the results estimate the determinants of growth slowdown in South Asia. The following table provides a basic summary of the baseline model.

Table 1: Summary of Baseline Model

Variables	Observations	Mean	Std. Dev.
GDP per capita	345	1,345.85	2,583.65
Square of GDP per capita	345	1,811,321	6,675,224
Lagged growth	344	726.252	1,128.622
Trade openness	333	55.643	52.356
Investment share	235	26.791	10.436
Industry share	325	22.400	7.241
Service share	330	46.513	13.588

Source: Author calculations.

Table 2 presents the probit analysis results of the break points—Zivot-Andrews structural break—of the baseline model. The four points estimate the independent variables that determine the growth slowdown.

GDP per capita is constantly significant over the structural break points in the analysis, indicating that the GDP growth is highly influential in determining the growth slowdown. In the first point, lagged growth is also significant, predicting the growth slowdown of the South Asian countries. In the second point, the inclusion of trade openness has also been significant in the analysis. In the fourth point, investment share and service share have been significant predictors of the growth slowdown. Therefore, the model estimates at the 5% level that the baseline model variables are significant determinants of the growth slowdown in South Asia.

Table 2: Baseline Model

Variables	Break Point (1)	Break Point (2)	Break Point (3)	Break Point (4)
GDP per capita	–0.25** (1.35)	0.43** (0.94)	–0.29** (2.15)	–0. 84** (0.61)
Square of GDP per capita	1.93 (3.19)	–1. 62 (1.14)	1.36** (1.71)	–1.36** (0.19)
Lagged growth	3.00** (0.06)	0.90 (0.23)	0.32** (0.89)	0.25 (0.09)
Trade openness		3.25*** (0.00)	0.36*** (0.94)	1.26*** (0.69)
Investment share			0.42 (0.29)	8.71** (0.35)
Industry share				0.28 (0.32)
Service share				–0.25** (0.48)
Constant	0.29 (0.79)	0.18** (0.36)	0.21 (0.92)	0.11 (0.35)
Pseudo R^2	0.75	0.48	0.31	0.52
Log likelihood	–11.43	–12.94	–6.08	–4.72

(**) and (***) indicate 5% and 1% level of significance, respectively.

Standard errors are in parenthesis.

Source: Author calculations

5.1 Macroeconomic Environment

The estimates of probit regression for structural break points are displayed above in Table 3. Column (1) is the baseline specification while Column (2) is trying to give an alternative definition of the baseline, by adding economic policies like inflation and exchange rate, and a similar variable to measure with capital formation. The effect of both is positive as expected, and closely associated with higher predicted probability for growth slowdowns. Further, capital formation specification is also significant at the 5% level. Therefore, the regressions in Columns (2)–(3) are adding complementary controls for macroeconomic instability onto the one in Column (1). Those macroeconomic factors are FDI, debt, real consumption, capital stock, and ODA, in addition to demographic profile, service and industry share, and GDP per capita in Column (3).

Following Column (1) as the benchmark specification of macroeconomic variables, it is worth noting the signs and the attributes for each one of its components, with every variable in Column (1) being highly significant except service share and square of GDP per capita. All macroeconomic variability can be estimated when comparing Column (1) with Column (4), indicating that exchange rate, FDI, real consumption, ODA, export share, and HCI are significant predictors of growth slowdown.

Table 3: Macroeconomic Environment Variables

Variables	Break Point (1)	Break Point (2)	Break Point (3)	Break Point (4)
GDP per capita	–7.08**	–7.41**	–2.48**	–2.54**
	(9.70)	(3.29)	(0.35)	(4.78)
Square of GDP per capita	–6.40	–4.03**	2.63	–3.45
	(0.56)	(1.51)	(1.34)	(1.67)
Lagged growth	0.53**	0.31**	0.07	0.09
	(0.69)	(0.07)	(0.53)	(0.00)
Trade openness	0.69**	0.13**	–0.21	–0.44**
	(0.20)	(0.32)	(0.19)	(0.24)
Investment share	–0.15**	–1.32**	–0.27	–0.59**
	(0.23)	(0.77)	(0.63)	(0.12)
Industry share	0.14**	0.23	0.31**	0.75**
	(0.88)	(0.45)	(0.78)	(0.44)
Service share	–0.37	1.43	–0.19**	–0.28
	(0.32)	(0.03)	(0.23)	(0.68)
Demographic profile	–11.42**	–4.32**	–12.99**	–15.56**
	(6.66)	(0.53)	(4.38)	(6.72)
Capital formation		0.42**	0.22	0.46
		(0.71)	(0.98)	(0.28)
Inflation		0.44**	0.65	0.22
		(0.05)	(0.44)	(0.04)
Exchange rate		0.49**	0.46**	–0.32**
		(0.32)	(0.43)	(0.07)
FDI			–10.75**	14.93**
			(3.19)	(4.67)
Debt ratio			0.73**	0.16**
			(0.45)	(0.16)
Real consumption			–1.04**	–0.31**
			(0.36)	(0.67)
Capital stock			2.54**	4.41
			(1.22)	(1.00)
ODA			3.42***	–6.47***
			(0.00)	(0.40)
Export share		0.60**		–0.35**
		(0.47)		(0.75)
HCI		11.52***		–7.49***
		(9.42)		(1.45)
Constant	–5.14	–2.39**	–6.15**	–4.09
	(26.66)	(8.36)	(6.26)	(2.06)
Pseudo R^2	0.53	0.49	0.48	0.43
Log likelihood	–23.72	–2.43	–25.74	–11.35

(**) and (***) indicate 5% and 1% level of significance.

Standard errors are in parenthesis.

Source: Author calculations.

The overall sensitivity of the model is straight, demographic profile, investment share of GDP in the regression have a negative sign, meaning that the higher the percentage of GDP produced, along with the increased demographic profile in SA countries, the lower the probability of experiencing a slowdown. Controversially, trade openness and industry share show a positive relationship, indicating that the higher the percentages of those control variables, the higher the probability of experiencing a slowdown. Lastly, with regard to the main explanatory variables, the demographic profile remains negative in all four regressions, and significant in the benchmark and the alternative columns (2), (3), and (4).

Adding more controls to enrich the model, in Column (4), export share and HCI effects are added, in order to proxy for macroeconomic instabilities that may reveal a development of growth in terms of higher human capital and trade share.

5.2 Demographic Transition

The demographic variables are capable of contributing to reducing the likelihood of growth slowdown, in order for demographic reconstruction in developing countries to be successful. It is an obvious fact that the demographic profile could lead to a huge variation in the growth slowdowns. GDP per capita and lagged growth are also used as the main exogenous variables of the study. As mentioned above, demographic variables can significantly change the societal structure and lead towards sustainment of higher growth. The demographic category aims to proxy for population and societal change, which enables growth-enhancing conditions.

In the baseline model, trade openness is almost negative and significant, implying that the increased trade openness reduces the experience of slowdown. The main effects of demographic variables are highly spontaneous and supported by the literature. Starting with fertility rate, which constitutes an exogenous measure—and proxies for the endogenous labor as a given endowment—the regressions report a significant and negative effect that pushes towards lowering the probability of a growth slowdown. Similarly, demographic profile and population density—proxy for rate of urbanization—have negative effects in the model at a highly significant level. But dependency ratio, young dependency, and labor force have a positive and strong association with growth slowdown.

Age dependency ratio also behaves very consistently across two specifications. In Columns (3) and (4), the age dependency ratio is taken at the total level, where both are positively significant at the 5% level. However, breaking down the total age dependency ratio into young and old age groups, young dependency is positively significant, and old dependency is omitted. Overall, the impact of the age dependency ratio for young ages seems to increase the predicted probability of total dependency.

Table 4: Demographic Variables

Variables	Break Point (1)	Break Point (2)	Break Point (3)	Break Point (4)
GDP per capita	–4.62**	2.65***	3.59	–3.32**
	(1.85)	(0.04)	(1.72)	(1.39)
Square of GDP per capita	1.60	1.63	1.31**	1.39**
	(1.08)	(1.78)	(1.08)	(1.71)
Lagged growth	0.07	0.37	0.39	0.05
	(0.03)	(0.92)	(0.76)	(0.32)
Trade openness	–0.28**	0.07**	–0.82***	–0.26**
	(0.00)	(0.08)	(0.03)	(0.81)
Investment share	0.73	0.43**	–0.47**	–0.04**
	(0.60)	(0.46)	(0.17)	(0.15)
Industry share	0.47**	0.45**	0.74**	0.34**
	(0.67)	(0.97)	(0.93)	(0.03)
Service share	0.37	0.67	0.41**	0.47**
	(0.89)	(0.29)	(0.03)	(0.85)
Demographic profile	–2.76**			–6.23**
	(3.25)			(2.85)
Fertility		–0.90**		–0.19**
		(0.33)		(0.21)
Dependency ratio	0.35**			0.74**
	(0.12)			(0.08)
Life expectancy		–0.42		–0.04
		(0.27)		(0.07)
Labor force		3.27**		1.56**
		(9.53)		(0.86)
Young dependency			0.83**	0.72**
			(0.87)	(0.63)
Old dependency			omitted	omitted
Population				–0.04
				(0.25)
Population density	–1.67***			–1.62***
	(0.86)			(0.64)
Constant	–16.44	–6.89	12.54***	–11.40
	(294.17)	(4.94)	(14.14)	(74.92)
Pseudo R^2	0.18	0.29	0.11	0.15
Log likelihood	–82.88	–5.45	–7.83	–7.97

(**) and (***) indicate 5% and 1% level of significance.

Standard errors are in parenthesis.

Source: Author calculations

5.3 Pool Probit Model

In order to identify the determinants of growth slowdown with respect to all controlled variables, the pool probit regression was estimated. Column (1) provides the baseline case of the variables and Column (4) provides the pool probit regression of all controls. Further, Column (2) provides the macroeconomic environmental conditions and Column (3) provides the comparison for demographic variables.

Table 5: Results of Pool Probit Model

Variables	Break Point (1)	Break Point (2)	Break Point (3)	Break Point (4)
GDP per capita	–8.76**	–4.92**	–2.62**	–1.63**
	(2.79)	(2.35)	(0.72)	(1.35)
Square of GDP per capita	–0.16	–1.53	–2.29	4.92
	(1.18)	(1.34)	(0.49)	(3.42)
Lagged growth	0.04**	0.14	0.39**	0.96**
	(0.48)	(0.36)	(0.12)	(0.48)
Trade openness	–0.06**	–0.38**	0.36**	–0.65**
	(0.61)	(0.21)	(0.62)	(0.24)
Investment share	–0.41**	–0.35	0.62**	–0.48
	(0.87)	(0.93)	(0.84)	(0.09)
Industry share	0.28	0.67**	0.45**	0.47**
	(0.54)	(0.84)	(0.23)	(0.36)
Service share	0.68	0.96	0.08	0.28
	(0.82)	(0.25)	(0.06)	(0.50)
Demographic profile	–12.86**	–18.64**	–2.84**	–5.43**
	(5.19)	(11.00)	(11.52)	(5.32)
Fertility			1.22**	1.78
			(1.33)	(1.90)
Dependency ratio			–2.78***	–4.92**
			(1.85)	(1.23)
Life expectancy			–0.76	0.43
			(0.41)	(0.08)
Labor force			1.14***	6.21**
			(0.56)	(6.72)
Young dependency			0.67	0.41
			(1.17)	(1.67)
Old dependency			omitted	omitted
Population			0.05**	0.32
			(0.43)	(0.48)
Population density			–3.65**	0.48
			(2.76)	(4.32)
Capital formation		0.04**		0.43
		(0.96)		(0.74)
Inflation		–0.15***		–0.73**
		(0.73)		(0.32)
Exchange rate		0.88**		0.72***
		(0.82)		(0.05)
FDI		–1.38**		–3.68**
		(1.78)		(1.67)
Debt ratio		0.75		0.05**
		(0.72)		(0.34)
Real consumption		1.83		–0.29
		(0.08)		(2.65)
Capital stock		9.46**		–8.16
		(2.58)		(3.54)
ODA		–3.19**		–5.42**
		(2.30)		(2.80)
Export share		0.74	0.87**	0.48
		(0.84)	(0.73)	(0.23)
HCI	17.42***	–13.92***	6.47***	–6.89***
	(5.84)	(2.32)	(2.48)	(4.33)
Constant	–16.24	7.76**	–1.74**	–5.35
	(4.16)	(4.17)	(6.17)	(23.75)
Pseudo R2 =	0.17	0.19	0.13	0.19
Log likelihood =	–17.83	–13.53	–6.87	–7.42

(**) and (***) indicate 5% and 1% level of significance.

Standard errors are in parenthesis.

Source: Author calculations.

The model predicts the growth slowdown in relation to the previous literature with some modifications in the pooled model. Starting with demographic profile, which measures the ratio of the working to the nonworking population, it shows a strong negative relationship with growth slowdown. This indicates that the increase of the working age population is lowering the impact on growth slowdown; otherwise the rate of growth increases. When it takes into consideration the fertility, dependency ratio, labor force, and population, all those demographic variables are positively related to growth slowdown and significant at the 5% level. But population density and rate of urbanization have been negatively related to the probability of growth slowdown occurring.

Demographic profile seems to be consistently significant across the four columns with negative remarks. When considering the full model, controlling for all covariates, three factors are related to the slowdown, i.e., demographic profile, dependency ratio, and labor force, at the 5% level of significance. Overall, demographic profile increases the predicted probability of growth slowdown.

6. AVOIDANCE OF MIDDLE-INCOME TRAP

According to Pritchett and Summers (2014), the middle-income trap is becoming authentic. However, the shift of labor from agriculture to industry declines as the capacity of the industrial sector reaches its limits and marginal productivity is embraced. Ohno (2009) states that global industrialization through continuous and higher investment is not adequate, as now the targeting needs to help domestic industry achieve higher growth. The conditions of the middle-income countries are also similar in terms of labor movement from agriculture to industrial or service sectors. Therefore, high-tech growth in terms of industrial and service sector productivity needs to be achieved. Hence, this study provides evidence that growth of FDI, ODA, and HCI will reduce the probability of growth slowdowns.

From the pool model, it can be predicted that a number of variables are significant predictors of the probability of growth slowdown in South Asia. Significant negative indicators are GDP per capita, lagged growth, trade openness, investment share, demographic profile, and FDI, whereas industry share, dependency ratio, labor force, inflation, exchange rate, ODA, and HCI are positively significant.

From the above two scenarios, negative factors reduce the probability of growth slowdown in South Asian economies. Therefore the factors that determine the growth slowdown can be considered for the policy recommendations to avoid the MIT in the South Asian region. Trade openness, investment share, and demographic profile are three main determinants of the slowdown with decreasing probabilities of MIT occurring. Meanwhile, those determinants can be related to the literature on avoidance of growth slowdown.

Ohno (2009) and Kharas and Kholi (2011) define two main conditions for this economic transition. First, specialization refers to high-quality new products based on the productive advantages of firms that must be able to compete with high-skilled producers and low-wage exporters. Second, the significance of education-based growth with respect to advancing the technological factor of the economy is highlighted. Eichengreen, Perkins and Shin (2011, 2013) find that growth slowdowns in rapidly growing economies almost always coincide with a deceleration in total factor productivity (TFP). Better education and higher shares of the GDP on education expenditures become necessary prerequisites for a critical transition of labor that is responsible for producing domestic innovation. TFP slowdowns may be largely

associated with depreciation of human capital, similar to the dynamics of the labor force. Kharas and Kholi (2011) emphasize that knowledge-based growth and constant reconstruction of the educational system are essential in order to compete with high-skilled producers, and ultimately reap the benefits from education-powered innovation. The HCI is one of the key determinants of the growth slowdown in the study.

7. CONCLUSION

The paper aims to develop a relationship between the MIT and growth slowdown in South Asian countries with special emphasis on demographics. Based on the previous literature and seminal studies, the paper examined the growth slowdown and determinants of growth slowdown in South Asian countries. In addition, an episode for identifying growth slowdown and MIT has been developed and the factors that determine the slowdown were estimated with the probit model after identification of structural breaks.

From the findings of this paper, it can be summarized that for economic growth, a number of key indicators are to be considered for inclusive economic growth of South Asian countries. Two sets of determinants of probability of growth slowdown are, in terms of significant negative factors, GDP per capita, lagged growth, trade openness, investment share, demographic profile, and FDI, whereas industry share, dependency ratio, labor force, inflation, exchange rate, ODA, and HCI are positively significant. Some literature suggests that a more attractive domestic environment for foreign investors can significantly improve the value added from foreign direct investment.

Literature defines two main conditions for this economic transition. First, specialization refers to high-quality new products based on the productive advantages of firms that must be able to compete with high-skilled producers and low-wage exporters. Second, the significance of education-based growth with respect to advancing the technological factor of the economy is highlighted. Demographic variables are: starting with fertility rate, which constitutes an exogenous measure—and proxies for the endogenous labor as a given endowment—the regressions report a significant and negative effect that pushes towards reducing the probability of a growth slowdown. Similarly, demographic profile and population density—proxy for rate of urbanization—have negative effects in the model at a highly significant level. But dependency ratio, young dependency, and labor force have a positive and strong association with growth slowdown.

REFERENCES

Aiyar, S. and A. Mody, *The Demographic Dividend; Evidence from the Indian States*. IMF Working Papers No. 11/38 (2011) International Monetary Fund.

Aiyar, S., Romain A. Duval, Damien Puy, Yiqun Wu and Longmei Zhang, *Growth Slowdowns and the Middle-Income Trap.* IMF Working Papers No. 13/71 (2013) International Monetary Fund.

Asian Development Bank (ADB), *The Future of Growth in Asia*, Asian Economic Outlook (2010), 37–89.

Bloom, D. and J. Williamson, *Demographic Transitions and Economic Miracles in Emerging Asia*, World Bank Economic Review, Oxford University Press (1998): 419–55.

Eichengreen, Barry, Dwight Perkins and Kwanho Shin, *Growth Slowdowns Redux: New Evidence on the Middle Income Trap* NBER Working Paper No. 18673 (2013).

———, When fast-growing economies slow down: International evidence and implications for China*. Asian Economic Papers*, 11 (2011): 42–87, 52.

Felipe, J., A. M. Abdon, and U. Kumar, *Tracking the Middle Income Trap: What is it, Who is in it, and Why?* Levy Economics Institute, Working Paper No. 715 (2012).

———, Product complexity and economic development. *Structural Change and Economic Dynamics*, 23 (1) (2012): 36–68.

Hausmann, Ricardo and C. Hidalgo, *Country Diversification, Product Ubiquity, and Economic Divergence*. CID Working Paper No. 201 (2010) Harvard University.

Hausmann, Ricardo, Lant Pritchett and Dani Rodrik, Growth accelerations. *Journal of Economic Growth*, 10 (2005): 303–329.

Kharas, H. and H. Kohli, What is the middle income trap: Why do countries fall into it, and how can it be avoided? *Global Journal of Emerging Market Economies* 3 (30) (September 2011): 281–289.

Mankiw, N. G., D. Romer and D. N. Weil, *A Contribution to the Empirics of Economic Growth,* NBER Working Paper No. 3541. (1992).

Ohno, K., Avoiding the middle income trap: Renovating industrial policy formulation in Vietnam. *ASEAN Economic Bulletin* 26 (1), (2009): 25–43.

Paus, Eva, *Foreign investment, development and globalization.* In: Can Costa Rica become Ireland? New York, Palgrave-Macmillan. (2005).

———, *Latin America and the Middle Income Trap.* ECLAC, Financing for Development Series 250 (2014).

Pritchett, Lant, Understanding patterns of economic growth: Searching for hills among plateaus, mountains and plains, *World Bank Economic Review*, 14 (2000): 221–250.

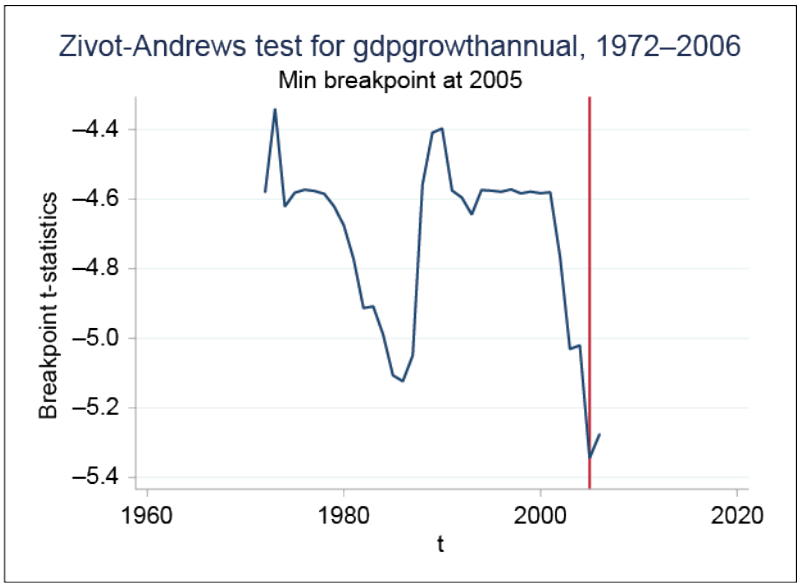
Pritchett, Lant, and Lawrence H. Summers, *Asiaphoria Meets Regression to the Mean*. No. w20573. National Bureau of Economic Research (2014).

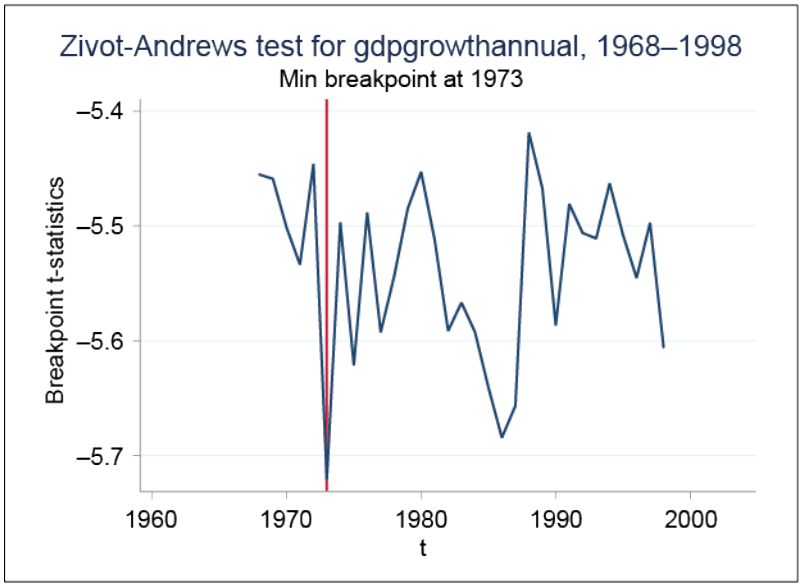
Robertson, Peter and Longfeng Ye, *On the existence of a middle income trap*. Economic Discussion Paper No: 13-12 (2013). University of Western Australia, Perth.

Sutton, J., *Competing in Capabilities: An Informal Overview,* London School of Economics, Manuscript, London (2005).

ANNEX

Structural Break Points using Zivot-Andrews Structural Break Test





continued on next page

Figure continued

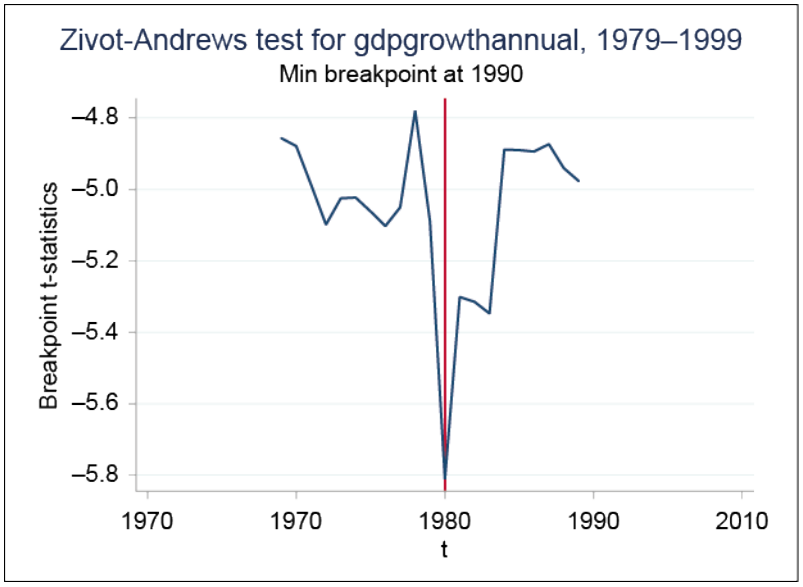


Table 6: Variable Description

Category	Variable Name
Baseline	GDP per capita (current US$)
	Lagged growth
	Trade (% of GDP)
	Total investment
	Industry, value added (% of GDP)
	Services, etc., value added (% of GDP)
Demographic	Demographic profile
	Fertility rate, total (births per woman)
	Age dependency ratio (% of working-age population)
	Life expectancy at birth, total (years)
	Mortality rate, infant (per 1,000 live births)
	Population ages 15–64 (% of total)
	Population ages 0–14 (% of total)
	Population ages 65 and above (% of total)
	Total population
	Population density
Macroeconomic environment	Gross capital formation (% of GDP)
	Inflation, average consumer prices
	Exchange rate
	Foreign direct investment, net outflows (% of GDP)
	Short-term debt (% of total reserves)
	Real consumption
	Capital stock
	Net official development assistance received (current US$)
Trade	Exports of goods and services (% of GDP)
Human capital	Human Capital Index

Growth Slowdown Episode

Table 7: Growth Slowdown Episode

Country	Year t	Growth Before (t-7 through t)	Growth After (t through t+7)	Difference in Growth	Per capita GDP US$ at t
Sri Lanka	1973	3.62	1.51	–2.11	219.66
	1990	4.34	–0.13	–4.47	470.35
	2005	3.91	–0.26	–4.17	1,259.81
Bangladesh	1971	6.41	3.50	–2.91	131.77
	1976	4.90	2.51	–2.39	138.72
	1991	4.22	2.10	–2.12	285.30
India	1971	3.98	–6.12	–10.10	120.95
Maldives	2009	4.02	1.63	–2.39	6,017.58
Nepal	1974	3.91	–6.23	–10.14	93.48
	1984	4.71	2.52	–2.19	158.00
	2002	6.53	2.81	–3.72	246.80
Pakistan	1978	6.13	2.32	–3.81	243.43
	2003	6.64	2.31	–4.33	565.32
Bhutan	1987	4.81	2.53	–2.28	505.40
	1991	3.88	2.11	–1.77	467.66
	2011	4.72	2.01	–2.71	2,485.79