EFFECT OF SOUTH ASIAN FREE TRADE AREA AGREEMENT ON ECONOMIC GROWTH OF THE REGION

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Abstract

South Asian Free Trade Area (SAFTA) is regarded as an undesirable trade agreement merely failing to encourage intra-regional trade expressively. According to the dynamic theory of trade integration, even a trade agreement like SAFTA can enlighten the integrated region's macroeconomic factors and boost economic growth. Therefore, it is essential to consider the dynamic efficiency of SAFTA when assessing its desirability. However, due to the lack of prior studies concentrating on its dynamic efficiency, the assessment of SAFTA is not impeccable. Thus, how macroeconomic factors mediate SAFTA in carrying its economic growth effects are investigated with this study. In this regard, a structural equation model is employed over the period 2003 to 2018. The results confirmed the dynamic efficiency of SAFTA because it leads to stabilizing the region's macroeconomic policies, reducing price distortion, encouraging physical investments, attracting FDIs, and furthering technology transmission. Meanwhile, macroeconomic policy credibility and physical investment are found as the two macroeconomic factors that significantly carry positive growth effects of SAFTA. Therefore, it is recommended to bring SAFTA to its full potential by further reducing tariffs and removing sensitive lists.

Keywords: Dynamic Efficiency, Economic Growth, Macroeconomic Factors, SAFTA, Trade Integration

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Introduction

The South Asian cooperative economic growth model, South Asian Free Trade Area (SAFTA), is regarded as a real outcome of the region's recent policy reforms. Its potential in achieving the region's policy interest is heavily questioned mainly because of inconsequential intra-regional trade expansions following the agreement. Lower developments in intra-regional trade would certainly hesitate its potential in static efficiency[1] . However, this study challenges this traditional assessment of SAFTA by emphasizing the necessity of considering dynamic efficiency when assessing its desirability.

A trade agreement may become dynamically efficient, even though it is statically inefficient (Balassa, 1961, Peiris et al., 2015). Balassa (1961) indicates that, as a result of entering into a Regional Trade Agreement (RTA), "an increase in the rate of growth can be considered as equivalent to an improvement in dynamic efficiency." Meanwhile, Schiff and Winters (1998) indicate that macroeconomic factors that increase economic growth rate following a trade agreement comprise dynamic efficiency. This suggests that, for SAFTA to be dynamically efficient, it should improve the region's macroeconomic factors, thereby boosting economic growth. However, empirical knowledge on the dynamic efficiency of SAFTA is yet to reach a peak due to the lack of prior studies. Most of the previous studies that examined the desirability of SAFTA were limited to its static efficiency. Thus, this study fills the literature gap by investigating the macroeconomic factors that mediate SAFTA in boosting the region's economic growth.

The rest of the sections of this study are structured as follows. Section 2 outlines the potential growth channels of SAFTA, while section 3 explains the methodology adopted in this study. Section 4 outlines the findings and discussion. Section 5 provides the conclusion for the task.

Potential Growth Channels of SAFTA

SAFTA may improve the credibility of government policies due to the threat of capital flight and the terms and conditions of the agreement (Whalley, 1996; Wacziarg, 2001). RTAs, by definition, lead to equalize the factor prices and encourage the factor movements. Thus, a high risk of capital flight may exist from countries with unstable macroeconomic policies to other member countries with stable policies because inconsistent macroeconomic policies would, however, encourage capital flight (Pastor, 1990; and Hermes and Lensin, 2001). This, in turn, would ask domestic policymakers to have credibility in government policies. Meanwhile, the terms and conditions of SAFTA would enhance the policy credibility of member countries as further domestic policy reforms are difficult to implement (Whalley, 1996). Fischer (1993) reported that government policy credibility might favorably affect economic growth by "reducing price uncertainty and moderating public deficit and debt levels.

[1] According to Viner (1950), a trade agreement is statically efficient when trade creation outweighs the trade diversion. Trade creation occurs when trade shifts from a high-cost supplier member country to a low-cost supplier member country. Trade diversion occurs when trade shifts from a low-cost supplier nonmember country to a high-cost supplier member country.

Thereby it reduces crowding out and the likelihood of future tax increases and furthering the ability of domestic firms to compete on global markets" (cited from Wacziarg, 2001).

SAFTA also discourage price distortion (PD) because this may influence countries to specialize in production according to their comparative advantage. Reduced price distortion would, in turn, leads to lowering price levels of goods that are traded internationally (Dollar, 1992). Also, open economies tend to maintain price levels of internationally traded goods at a competitive level. Alvarez and Braun (2006) indicate that PD is negatively associated with the degree of openness and the volume of exports and imports. Also, the extent of production reallocation is positively related to the relative price changes during liberalization periods. According to Easterly (1989, 1993), price distortions adversely affect both factor accumulation and growth, and thus, the potential of SAFTA in lowering PD would be a significant dynamic channel of economic growth.

Besides, SAFTA may influence factor accumulation, basically through the increased market size effect. Wacziarg (2001), following Adams Smith, indicates that larger markets tend to diversify the labor more and thus, provide increasing returns to scale. Hence, it may lead to a "big push effect" to capital accumulation, leading these less developed countries to boost their growth rates. Meanwhile, Wacziarg (1998) states that market size enhancements influence new firms to have significant fixed investments. Therefore, SAFTA may affect economic growth by influencing the domestic rate of physical investment (PI). Further, it may encourage Foreign Direct Investments (FDI) to the region. The potential to reduce trade costs, increase market size, improve policy credibility, and lower PD would significantly attract FDI. In turn, these FDI may favorably affect economic growth through channels like technology transfer, human capital, learning-by-doing, labor force, and international trade (Nabende, Ford, and Slater, 2001). Javorcik (2010) further indicates that the spillover effect of tacit knowledge, know-how, management techniques, and marketing strategies of multinationals' may be equally crucial for the FDI recipients. Hence, the potentiality of SAFTA in attracting FDI to the region would be another dynamic channel of economic growth.

Technology transfer (TT) is also considered as a significant RTA-specific dynamic effect. It may occur in several ways. On the one hand, the trade expansion effect of RTAs may lead to a substantial technology transfer, primarily due to the reverse engineering process (Saggi, 2002). On the other hand, as FDI theories indicate, FDI provides a significant TT effect to the host countries through horizontal and vertical processes. Moreover, endogenous growth models confirm the potentiality of new technology in shifting a country to a long-run growth path (Barro and Sala-i-Martin, 1997; Grossman and Helpman, 1991). Thus, SAFTA should have the potential to improve economic growth through the effect of TT as well. Finally, the accumulation of human capital (HC) can be considered another channel that links RTAs and economic growth. If RTAs increase relative returns to factors, they may accumulate HC (Wacziarg, 2001). For instance, among other possible ways, if SAFTA encourages technology transmission and if technology and labor skills are complements, then SAFTA would improve

HC through technology improvements. SAFTA may also enhance the HC of member countries through increased competition, inward FDI, learning by doing, know-how, and reverse engineering processes. Conversely, Economic growth models evidence that an increase in HC would positively affect economic growth (Barro, 1991; Levine and Renelt, 1992). Hence, the potential of SAFTA in accumulating HC may lead to fastening member countries' growth rates.

Methodology

In this study, the growth effects of SAFTA are investigated by examining how macroeconomic factors mediate SAFTA to boost economic growth. Six macroeconomic variables have been identified in this regard. These are government policy credibility (GPC), price distortion (PD), physical investment (PI), inward FDIs (IFDI), technology transfer (TT), and human capital (HC). A structural equation model is used to measure the mediation effect.

The Structural Model

The basic framework for the structural model consists of M (m = 1….M = 7) structural relationships (endogenous variables = y) and L (l = 1….L) exogenous variables (x). Endogenous equations include a cross-country growth equation and another six equations for each of the macroeconomic variables. This structural relationship is measured over a T time period (from 2003 to 2018) for N (eight) countries (i = 1….N). Thus, a set of TM equations can be identified for the most unrestricted version of the model;

$$\beta_{11}^{tm} y_{i11} + ... + \beta_{T1}^{tm} y_{iT1} + ... + \beta_{1M}^{tm} y_{i1M} + ... + \beta_{TM}^{tm} y_{iTM} + \lambda_{11}^{tm} x_{i11} + ... + \lambda_{T1}^{tm} x_{iT1} + ... + \lambda_{1L}^{tm} x_{i1L} + ... + \lambda_{TL}^{tm} x_{iTL} = \varepsilon_i^{tm} \quad (1)$$

Where all the superscripts indicate equations and subscripts indicate variables. However, as the above model is far too general, following Tavares and Wacziarg (2001), several restrictions were introduced. To ensure the model is not dynamic, the non-contemporary coefficients were made equal to zero ($\beta_{sm}^{tm} = \lambda_{sm}^{tm} = 0$ for all s different from t). A cross-time parameter restriction was imposed to equalize coefficients across time, that is; $\beta_{tm}^{tm} = \beta_{tm}^{sm}$ *and* $\lambda_{tm}^{tm} = \lambda_{tm}^{sm}$. To specifically identify the mth variable as the dependent variable for the mth equation β_m^m was equated to one. According to the restrictions imposed so far, each set of T equations for one of the available M relationships would be;

$$y_{im} = \varepsilon_i^m - \beta_1^m y_{i1} - ... - \beta_M^m y_{iM} - \lambda_1^m x_{i1} - ... - \lambda_L^m x_{iL} \quad (2)$$

Where, y_{im}, x_{il}, and ε_i^m are the (T x 1) vectors that stack each endogenous variable m = 1….M, each exogenous variable l = 1….L, and each disturbance m = 1.…M, over the T periods. Thus, equation (2) depicts the properties of the panel data model, where the data for each of the individual countries have been stacked over time.

The joint estimation of the above system of equations would generate a large covariance matrix for the ε_i^m errors. This can be stacked into a vector of ε_i where, $E(\varepsilon_i) = 0$ and $E(\varepsilon_i \varepsilon_i') = \sum$. Cross-period and cross-equation error covariances of the system are represented by the off-diagonal elements of $\sum$. Allowing these off-diagonal elements to differ from zero would ensure the estimates' efficiency (Wacziarg, 2001). Further, varying these cross-period error covariances from zero is similar to allowing the error terms to represent country-specific effects independent from the right-hand side variables (Tavares and Wacziarg, 2001; and Wacziarg, 2001). Thus, the system would form an approach equivalent to the random effects model (Tavares and Wacziarg, 2001).

Estimation of Structural Parameters

Parameter bias is a significant concern in the above structural model as several endogenous variables appear on the structural equation's right-hand side. Therefore, these (TM) equations were jointly estimated by using three-stage least squares (3SLS) estimator, introduced by Zellner and Theil (1962). 3SLS estimator combines two-stage least squares (2SLS) properties and seemingly unrelated regression (SUR) estimators. Thus, it is an Instrumental Variable-generalized least squares (IV-GLS) technique that guarantees consistency and efficiency through instrumenting and appropriate weighting.

Identification of Model Specifications

When determining the appropriate determinants for the system of equations, specifications commonly used in the empirical literature are chosen. For the growth equation, a neoclassical production function was augmented to include the mediator variables as the growth regresses. However, the effect of SAFTA is not directly included in the growth equation; instead, it is adjusted in the mediator equations. To further emphasize the foundation of this mediation analysis, a neoclassical production function can be considered as follows;

$$Y = AK^{\alpha} H^{\beta} L^{1-\alpha-\beta} \quad (3)$$

Where, A denotes the technology, K physical capital, H human capital, and L labor. α and β are the elasticity of respective variables.

The traditional Solow decompositions for the equation (3) above are obtained by dividing it by L and differentiating concerning the time. Thus, equation (4) provides the Solow decompositions.

$$\frac{\dot{y}}{y} = \frac{\dot{A}}{A} + \alpha \frac{\dot{k}}{k} + \beta \frac{\dot{h}}{h} \tag{4}$$

Where lowercase letters stand for the per capita values. $\dot{y}$ indicates the per capita output growth. $\dot{A}$ indicates the technology growth. $\dot{k}$ indicates the per capita physical capital growth. $\dot{h}$ indicates the per capita HC growth.

The above Solow decompositions indicate that technology, physical capital, and HC are the ultimate drivers of per capita growth. Thus, this mediation analysis should examine the effect of SAFTA through these ultimate drivers without directly including it in the growth regression. However, on the one hand, the estimation of the mediation effect through other variables like MPC, PD, and inward FDIs would lead to a complicated system of equations. Also, this would involve estimating a large number of parameters, lowering the efficiency of estimates, because such a system requires the sequential estimation of three steps. On the other hand, Wacziarg (2001) stated that limiting the growth determinants only to technology, physical capital, and human capital would oversimplify the growth model. Therefore, to allow for the effects of SAFTA on growth through such other variables demands the augmentation of the list of growth determinants in the growth regression. Further, following cross-country growth literature (for instance: Barro, 1991; Barro and Sala-i-Martin, 1997; Wacziarg, 2001; and Tavares and Wacziarg, 2001), an augmented Solow model is developed as the growth equation. As all mediator variables appear jointly in the growth regression, any effect of SAFTA on growth will be reflected through these mediator variables.

$$Y_{it} = \beta_0^Y + \beta_1^Y II_{it} + \beta_2^Y MPC_{it} + \beta_3^Y PD_{it} + \beta_4^Y PI_{it} + \beta_5^Y IFDI_{it} + \beta_6^Y TT_{it} + \beta_7^Y HC_{it} + \varepsilon_{it} \tag{5}$$

Where Y_{it} indicates the per capita growth of county i in the period t. II_{it}^{Y} indicates initial income of county i in the period t. MPC_{it} indicates the macroeconomic policy credibility of county i in the period t. PD_{it} indicates the price distortion of county i in the period t. PI_{it} indicates the physical investment of county i in the period t. $IFDI_{it}$ indicates the inward FDI of county i in the period t. TT_{it} indicates the technology transfer of county i in the period t. HC_{it} indicates the human capital of county i in the period t. ε_{ij} is the error term.

Model specifications for the six macroeconomic variables are determined based on the empirical literature. MPC equation is mainly borrowed from Wacziarg (2001), and Tavares and Wacziarg (2001).

$$MPC_{it} = \beta_0 + \gamma_1 SAFTA_{it} + \beta_1 PD_{it} + \beta_2 II_{it} + \beta_3 GS_{it} + \beta_4 PoP_{it} + \beta_5 TofT_{it} + \varepsilon_{it} \tag{6}$$

Where $SAFTA_{it}$ is the trade expansion effect of SAFTA. PD_{it} indicates the price distortion of county i in the period t. II_{it} indicates the initial income of county i in the period t. GS_{it} indicates

the government size of county i in the period t. PoP_{it} is the population of county i in the period t. $TofT_{it}$ is terms of trade of county i in the period t. ε_{ij} is the error term.

Equation (7) represents the model specifications for PD, which are based on Tavares and Wacziarg (2001), and Wacziarg (2001).

$$PD_{it} = \beta_0 + \gamma_1 SAFTA_{it} + \beta_1 II_{it} + \beta_2 GS_{it} + \beta_3 TofT_{it} + \beta_4 Demo_{it} + \beta_5 PoPDen_{it} + \varepsilon_{it} \quad (7)$$

Where $Demo_{it}$ is the democracy of county i in the period t. $PoPDen_{it}$ is the population density of county i in the period t. Other variables are the same as in equation (6).

Equation (8) represents the model specifications for PI, which are based on Barro and Sala-i-Martin (1995), Tavares and Wacziarg (2001), and Wacziarg (2001).

$$PI_{it} = \beta_0 + \gamma_1 SAFTA_{it} + \beta_1 II_{it} + \beta_2 PD_{it} + \beta_3 MPC_{it} + \beta_4 PoP65_{it} + \beta_5 PoP15_{it} + \varepsilon_{it} \quad (8)$$

Where $PoP65_{it}$ is the population over age 65 for county i in the period t. $PoP15_{it}$ is the population under age 15 for country i in time t. Other variables are the same as in equation (6).

Equation (9) represents the model specifications for IFDI, which are based on Nabende, et al. (2001), Tavares and Wacziarg (2001), and Wacziarg (2001).

$$IFDI_{it} = \beta_0 + \gamma_1 SAFTA_{it} + \beta_1 GS_{it} + \beta_2 PD_{it} + \beta_3 TofT_{it} + \beta_4 Demo_{it} + \beta_5 Infra_{it} + \varepsilon_{it} \quad (9)$$

Where $Infra_{it}$ is the infrastructure of county i in the period t. Other variables are the same as in equations (6) and (7) above.

Equation (10) represents the model specifications for TT, which are based on Nabende, at el. (2001), Tavares and Wacziarg (2001), and Wacziarg (2001).

$$TT_{it} = \beta_0 + \gamma_1 SAFTA_{it} + \beta_1 II_{it} + \beta_2 PD_{it} + \beta_3 PoP_{it} + \beta_4 Infra_{it} + \beta_5 SSE_{it} + \varepsilon_{it} \quad (10)$$

Where SSE_{it} is Secondary School Enrolment of county i in the period t. Other variables are the same as in equations (6) and (9) above.

Equation (11) represents the model specifications for HC, which are based on Nabende, at el. (2001), and Tavares and Wacziarg (2001).

$$HC_{it} = \beta_0 + \gamma_1 SAFTA_{it} + \beta_1 II_{it} + \beta_2 GS_{it} + \beta_3 IDFI_{it} + \beta_4 Demo_{it} + \beta_5 SSE_{it} + \beta_6 LB_{it} + \varepsilon_{it} \quad (11)$$

Where LB_{it} is the labor force of country i in time t. Other variables are the same as in equations (6), (7), and (10) above.

Estimating the Mediation Effect

In estimating the mediation effect of SAFTA on economic growth, a procedure developed by Sobel (1982), which is commonly known as Sobel test, is employed in this study. Herein, the interested parameters are the ones that describe the effect of SAFTA on each of the mediator variables (γ_1^{MPC}, γ_1^{PD}, γ_1^{PI}, γ_1^{IFDI}, γ_1^{TT}, and γ_1^{HC}) and the parameters that describe the effect of each mediator variable on growth (β_2^Y, β_3^Y, β_4^Y, β_5^Y, β_6^Y, and β_7^Y). Then, the product of the corresponding parameters on a particular growth path would provide the respective mediation effect. For instance, a product of the coefficients that indicates the effect of SAFTA on MPC (γ_1^{MPC}) and the effect of MPC on growth (β_2^Y), that is $\gamma_1^{MPC}\ \beta_2^Y$, indicates the mediation effect of SAFTA on growth through MPC. When testing the statistical significance of the above mediation effect, the standard error of $\gamma_1^m\ \beta_m^Y$ (S_{ab}) can be obtained from the following equation (Aroian, 1944; Baron and Kenny, 1986 and Sobel, 1982);

$$S_{ab} = \sqrt{b^2 S_a^2 + a^2 S_b^2 + S_a^2 S_b^2} \quad (12)$$

Where S_{ab} is the standard error of the $\gamma_1^m\ \beta_m^Y$. b indicates β_m^Y. a indicates γ_1^m. S_a^2 is the variance of the equation that describes the effect of SAFTA on the mediator variable. S_b^2 is the variance of the equation that describes the effect of the mediator variable on growth.

Measurement of Mediator Variables

When quantifying the mediator variables identified with this study, most commonly used proxies in the empirical literature are used for some of the variables as they are not straightforward, while the rest are grabbed directly from the sources. For instance, PI or the domestic investment rate and IFDI can be captured quite certainly without using proxies through various data sources directly, but other mediator variables are measured through appropriate composite indices or approximations.

The government effectiveness index provided by Kaufmann, Kraay, and Zoido (1999) is used to proxy the macroeconomic policy credibility. According to Kaufmann, et al. (1999) it "captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5". Relative rate of assistance (RRA) values provided by Anderson, and Nelgen (2013) are used to proxy price distortion. As aggregate values for the region are given, they are proportionate according to the population in arriving at the values for individual countries. Equation 13 provides the estimates for RRA.

$$RRA = \left[\frac{1 + NRAag^{t}}{1 + NRAnonag^{t}} - 1 \right] \quad (13)$$

Where NRAag indicates the nominal rate of assistance of tradable only in the agricultural sector. NRAnonag indicates the nominal rate of assistance of tradables in nonagricultural sectors. NRA is the summation of the nominal rate of assistance to output conferred by border market price support, the nominal rate of assistance to output conferred by domestic market price support, and the nominal rate of assistance to input.

According to Wacziarg (2001), on the one hand, a country's competitive capacity in the world market would largely depend on how well that particular country incorporates modern technology into the production processes. On the other hand, for the TT to truly exist, new technological advances and new knowledge from various sources should embody in the production processes. Therefore, the share of manufactured goods exports in the total merchandise exports can be validly approximated to TT. In measuring HC, this study assumes that higher average years of secondary and tertiary schooling mean a higher accumulation of human skills. Therefore, following Barro and Lee (1) and Tavares and Wacziarg (2001), HC is approximated to the Barro-Lee: average years of secondary and tertiary schooling over age 25.

Measurement of Mediation Variable

Following Peiris et al. (2017) the mediation variable, “SAFTA”, is proxied by the trade expansion effect of SAFTA, which is predicted by using an augmented gravity equation (equation 14). A gravity model is used, because it is considered as one of the most successful empirical methods with the good fit (Anderson, 2011), high level of explanatory power, (Ivus and Strong, 2007; Bergstrand and Egger, 2011), and also "have produced some of the clearest and most robust empirical findings" (Leamer and Levinsohn, 1995).

$$\ln T_{ijt} = \alpha_t + \alpha_{ij} + \alpha_i + \alpha_j + \lambda \ln(T_{ijt-1}) + \beta_1 \ln(GDP_{it} * GDP_{jt}) + \beta_3 \ln(PGDP_{it} * PGDP_{jt})$$
$$+ \beta_3 \ln(DIS_{ij}) + \sum_{l=1}^{3} \chi_l (X_{ij}) + \varphi_1 PPF_{it} + \theta_1 PPF_{jt} + v_{ijt} \quad (14)$$

Where, λ is the coefficient of lagged effect of trade, (GDP_{it}*GDP_{jt}) represents the interaction term of GDPs in country i and country j. ($PGDP_{it}$*$PGDP_{jt}$) represents the interaction term of per capita GDPs in country i and country j. X_{ij} represents a vector of dummy variables that represent common language (l = 1), colonial ties (l = 2), and landlock (l = 3). PPF is the common component of governance indicators estimated by Kaufmann, at el. (1999). PPF is used to proxy

the political factors. α_t is supposed to represent omitted variables that capture any common shocks that affect trade in a particular year and the time trends in trade. α_{ij} denotes country pair fixed effects. α_i denotes exporter country-specific fixed effects. Importer country-specific fixed effects are denoted by α_j. v_{ij} is the error term.

The gravity equation is estimated using a two-step System-GMM estimator over the period 2003 to 2018. The data set covers 87 commonly traded partner countries, which includes only seven (07) South Asian countries. Bhutan is not considered due to a lack of data. The sample size is limited to 87 countries considering the commonness of trading partners and availability of data. According to Magee (2008), it is possible to predict the trade expansion effect by comparing actual levels of trade with predicted levels. The issue of obtaining consistent predictions when the dependent variable is given as a log value is handled following Wooldridge (2006). He points out the following equation in this regard. That is; $\hat{T}_2 = \alpha_0 \times \exp\left(\hat{lnT}\right)$. Where, α_0 is the coefficient in linear regression (without an intercept) of T_{ijt} on $\exp\left(\hat{lnT}\right)$. Thus, the difference between actual trade (T_{ijt}) and $\hat{T}_{ijt}$ would provide the trade expansion effect of SAFTA.

Robustness Analysis

The 3SLS model implemented with this study is tested for robustness based on the estimation method, model specification, and the level of development of the countries. The robustness of the estimation method is tested by employing a Seemingly Unrelated Regression (SURE) estimator, which is considered less consistent but highly efficient. However, it may provide a good indication of the model's robustness. In addition to the SURE model, mediation analysis under structural equation modeling (SEM) is also used to provide robustness to the estimation method. Next, the model specifications are adjusted to account for time-invariant region-specific fixed effects. In this regard, a dummy variable is introduced to each of the equations in the system. This dummy would take a value of one for the period 2006 to 2013 and zero for the rest of the years. Final robustness is done by restricting the sample only to the developing countries within the region (India, Maldives, Pakistan, and Sri Lanka.), because the absorption of dynamic effects might vary depending on the levels of development.

Results and Discussion

The influence of SAFTA on six theoretically chosen growth determinants was tested to measure its dynamic welfare effects. In this regard, a structural model was estimated using Three-Stage Least Squares (3SLS) estimation technique. Coefficient estimates for the structural model were reported in Table 1.

Table 1: Coefficient Estimates for the Structural Model

	Three-Stage Least Squares							**Seemingly Unrelated Regression**						
	Growth	**MPC**	**PD**	**PI**	**IFDI**	**TT**	**HC**	**Growth**	**MPC**	**PD**	**PI**	**IFDI**	**TT**	**HC**
Constant	-28.655	1.896***	5.139	1.585	1.992	1.528**	-9.097*	22.966	2.929*	7.624	2.968**	-0.704	3.469*	-7.085**
SAFTA	-	0.659*	-0.997*	0.426*	0.533*	0.444*	0.426	-	1.019*	-0.637**	0.640*	0.723*	0.474*	0.542***
Initial Income	-4.729	-0.960*	2.059**	0.311	-	-0.988*	1.215	-3.848	-1.662*	0.156	-0.241	-	-1.250*	0.604
Government Consumption	-0.332	0.045*	-0.167*	-	0.045**	-	0.140*	-0.308	0.057*	0.013	-	0.039***	-	0.149*
Endogenous Variables														
Macroeconomic Policy Credibility	7.451***	-	-	-1.199*	-	-	-	2.880	-	-	-0.335*	-	-	-
Price Distortion	3.331**	-0.118*	-	-0.379*	-0.215**	0.114*	-	0.276	-0.017	-	-0.091*	-0.024	0.020*	-
Physical Investment	8.577**	-	-	-	-	-	-	0.249	-	-	-	-	-	-
Inward FDI	-1.046	-	-	-	-	-	-0.387*	0.491	-	-	-	-	-	-0.290*
Technology Transfer	-20.705**	-	-	-	-	-	-	-9.960**	-	-	-	-	-	-
Human Capital	-0.780	-	-	-	-	-	-	0.834	-	-	-	-	-	-
Exogenous/Instrumental Variables														
Log Population	-	-0.846*	-	-	-	-0.260*	-	-	-1.176*	-	-	-	-0.412*	-

Terms of Trade	-	0.003***	-0.019*	-	0.004	-	-	-	0.007*	-0.049*	-	0.009*	-	-
Democracy	-	-	-0.942*	-	-0.270	-	-0.195	-	-	-2.130*	-	-0.319	-	-0.107
Population Density	-	-	-1.075*	-	-	-	-	-	-	0.287	-	-	-	-
Population Over 65	-	-	-	24.357*	-	-	-	-	-	-	10.039**	-	-	-
Population Under 15	-	-	-	2.662**	-	-	-	-	-	-	2.346***	-	-	-
Infrastructure	-	-	-	-	0.788	0.595**	-	-	-	-	-	3.168**	-0.699*	-
Secondary School Enrollment	-	-	-	-	-	0.002*	-	-	-	-	-	-	0.003*	-
Labor Force	-	-	-	-	-	-	0.576	-	-	-	-	-	-	0.314

Reported results indicate that out of six growth determinants considered with this study, four significantly influence the region's economic growth. In the growth equation, MPC, PD, PI, and TT were found to be statistically significant. Inward FDIs and HC are the two theoretical growth determinants that are not significant in the growth equation. Relatively lower FDI inflows and lack of secondary and tertiary education among the region's labor force might have caused these insignificances. SURE estimates, which were used to provide robustness to the 3SLS estimates, confirm TT's significance in influencing growth. However, other growth determinants are found insignificant under the SURE model.

3SLS estimation results for dynamic effects of SAFTA indicate that impacts of SAFTA are statistically significant on five out of six macroeconomic factors considered. Herein, the MPC equation depicts a positively significant coefficient for SAFTA, indicating its favorable influence on stabilizing the region's macroeconomic policies. On the one hand, this confirms the argument on policymakers' behavior towards stable macroeconomic policies due to the threat of capital flight that a regional trade agreement may result in. On the other hand, as Whalley (1996) argued, the difficulty of introducing further domestic policy reforms due to a general trade agreement's terms and conditions may also improve macroeconomic stability within the region.

As expected, the SAFTA coefficient in the PD equation is negatively significant, indicating that SAFTA leads to reduce price distortions among these countries. This would have resulted, as it encourages specialization on production according to their comparative advantage. This finding also confirms Alvarez and Braun's (2006) argument of a negative association between PD and the degree of trade openness. The effect of SAFTA on PI is positively significant, which means that SAFTA encourages more and more PI within the region. The increased market size effect of SAFTA may promote accumulation capital because it influences new firms to have large fixed investments, and importing new capital goods may remove structural constraints on investment. Wacziarg (2001) also reported a positive relationship between PI and trade policy. Thus, this finding provides further evidence for the favorable effect of RTAs in encouraging more and more PI.

The potentiality of RTAs in attracting FDIs to the integrated region is once again confirmed as the SAFTA coefficient positively significant in the inward FDIs equation. Among many researchers who indicated the potentiality of trade agreements in attracting FDIs, Athukorala (2013) stated the substantial increase in FDIs to the South Asian region following market-oriented policy reforms during the last three decades. This study provides further evidence for the significance of SAFTA as a policy reform that helps in attracting FDIs to the region. TT can also be considered another significant dynamic welfare gain since the SAFTA coefficient in the TT equation is statistically significant at a 99% confidence level. This may have resulted either due to reverse engineering processes that the expanded trade could bring about or due to TT's horizontal and vertical processes that may have been encouraged by the expanded FDIs. Wacziarg (2001) and several others reported a significant association between technology transfers and trade policies. Therefore, this study confirms SAFTA as a viable trade policy even through its potentiality in providing TT effects to the region.

The other dynamic effect that was tested with this study is the influence of SAFTA on HC development. Though literature evidence HC developments following trade policy improvements (Nabende et al., 2001), SAFTA fails to provide further evidence in this regard. Even though SAFTA leads to open up several sources of HC development, lack of secondary and tertiary education among these countries' labor force may have caused this result. Further FDIs, being a significant source in this regard, may not have given HC's expected impact due to its inadequacy. Results for the 3SLS estimation technique indicate that all the growth determinants considered with this study are significantly influenced by SAFTA, except human capital. Quite a similar work was found when these dynamic effects are robust with the estimation technique. That is, results for the SURE model depict almost similar dynamic effects for SAFTA. Moreover, the SURE model provides a significant coefficient for SAFTA under the HC equation as well.

Effect of SAFTA on Economic Growth

Mediation effects of SAFTA were measured following the results obtained for 3SLS estimation. Coefficient estimates for these mediation effects were reported in Table 2.

Table 2: Estimates for Channel Effects

Channel Variable	Effect of Channel on Growth	Effect of SAFTA on Channel	Channel Effect
Macroeconomic Policy Credibility	7.451	0.659	4.914
	(1.740)	(6.460)	(1.665)
Price Distortion	3.331	-0.997	-3.321
	(2.420)	(-4.970)	(-2.138)
Physical Investment	8.577	0.426	3.654
	(2.290)	(7.500)	(2.175)
Inward FDIs	-1.046	0.533	-0.558
	(-0.700)	(4.350)	(-0.669)
Technology Transfer	-20.705	0.444	-9.188
	(-2.270)	(11.110)	(-2.219)
Human Capital	-0.780	0.426	-0.333
	(-0.590)	(1.370)	(-0.451)

Note: Numbers in parentheses are t-statistics

Reported results indicate that SAFTA influences economic growth positively through two out of six mediators. MPC and PI are the two growth determinants that mediate positively. In both instances, a positive effect of SAFTA on the mediator variable and a positive impact of the mediator variable on economic growth were observed. Price distortion, inward FDIs, technology transfer, and HC show adverse mediation effects. These negative effects mainly resulted from the negative effects of the respective mediator variable on economic growth except price distortion. At a 95% confidence level, the statistical significance is observed only in PD, PI, and TT channels. MPC channel is significant at a 90% confidence level. The remaining mediation estimates are statistically insignificant.

MPC was found to be the most crucial mediator as it depicts the highest positive coefficient for the mediation effects. This indicates that SAFTA carries its economic growth effects mainly through its potentiality in stabilizing the region's macroeconomic policies. As theory suggests, the potential of trade agreements in stabilizing macroeconomic policies and subsequent economic growth effects resulting from lower price uncertainty, lower public debt levels, reducing crowding out, less likelihood of future tax increases, and improving the ability of domestic firms in competing on global markets may have caused this result (Fischer, 1993; Wacziarg, 2001). The potential of SAFTA in furthering the region's economic growth by encouraging PI is the other most influential economic growth channel. Reported results indicate that SAFTA significantly increases the region's investment rate, while PI significantly affects its growth. Therefore, the effect of SAFTA on economic growth through PI was also found positively significant. As indicated in the previous section, the increased market size effect, which opens several avenues for capital accumulation, may have led these less developed countries to boost their economic growth rates. Wacziarg (2001) also reported PI as one of the most important economic growth channels of trade policy openness. Thus, this study confirms the significance of PI as an economic growth channel even for the trade agreements like SAFTA.

PD depicts a negatively significant channel effect for SAFTA. This negative mediation effect is due to the positive impact of the channel on economic growth. Although an inverse relationship between PD and economic growth was expected, results provide a positively significant coefficient. This indicates that prevailing PD within the region positively affects the region's economic growth. As expected, the effect of SAFTA on PD is negatively significant, which means its potentiality in lowering price distortion. Even though decreasing PD is theoretically considered a favorable effect, it appears unfavorable in SAFTA because it reduces the direct positive growth effect of price distortion. Therefore, besides the potentiality of SAFTA in lowering the region's price distortion, it is considered undesirable as an economic growth mediator.

TT is also a highly undesirable mediator as it depicts a negative coefficient, which is momentous both in terms of magnitude and significance. This is a surprising result in light of the importance accorded to TT as an economic growth channel of SAFTA. However, it is a highly significant dynamic effect of SAFTA because the effect of SAFTA on the channel is positively significant. Then again, this adverse mediation effect is due to the negative effect of channel on economic growth, indicating that TT negatively affects the region's economic growth. This might have resulted from the proxy, the share of manufactured exports in total merchandise exports, used to capture technology transmission. Agricultural products mainly dominate the region's exports, and the share of manufactured exports is relatively lower. According to the World Bank trade statistics, even among merchandise exports, manufactured exports show a declining trend for most countries. On the other hand, the region's trade policies, which offer import substitution characteristics under protection, may have led to this inverse relationship between manufactured exports and economic growth. As Johnson (1975) and Balassa (1978) indicated, increases in capital stock due to continued import substitution under

protection may bring about a shift of labor into the protected capital-intensive industry that, in turn, will adversely affect economic growth.

Inward FDI is found statistically insignificant as a mediator of SAFTA. This is mainly due to the absence of significant inward FDIs in the region. However, SAFTA significantly influences attracting FDIs to the region. This indicates that the mediation effect is weakened mainly due to the inadequacy of the channel. HC's channel effect was also found insignificant as its effects on economic growth and the effect of SAFTA on it are both statistically insignificant. The lack of secondary and tertiary education among the labor force and even the low levels of inward FDIs may have led to this insignificance. The World Bank statistics show that the labor force with no education in India and Pakistan accounted high as 40.3% and 47.7%, respectively, due to lower literacy rates. In Sri Lanka, about 67.1% of the labor force is represented by those who had only primary education. The labor force with secondary or tertiary education in these countries is very low, which indicates that HC is still immature. Therefore, the chances of HC development through avenues like reverse engineering and learning by doing are limited. This, in turn, hinders the potentiality of SAFTA in caring for its economic growth effects through human capital.

Robustness Analysis of Mediation Effects

Mediation effects were tested for robustness in several ways. First, they were tested concerning the estimation technique. Both SURE and SEM Mediation techniques were used in this regard. Then a different model specification is used. That is, a dummy variable is employed to control time-invariant region-specific fixed effects. Finally, the robustness was examined considering the level of economic development that is by eliminating least developed countries from the sample. The coefficient estimates for these alternative models were reported in Table 3.

Table 3: Channel Effects under Alternative Models

Channel Variable	Baseline Model (3SLS)	SURE	SEM Mediation	SAFTA Dummy	Developing Countries
Macroeconomic Policy	4.914	2.935	2.754	1.834	-15.988
Credibility	(1.665)	(1.511)	(1.590)	(0.902)	(-1.968)
Price Distortion	-3.321	-0.176	-0.217	-3.384	-6.473
	(-2.138)	(-0.894)	(0.979)	(2.193)	(-2.185)
Physical Investment	3.654	0.159	0.286	4.460	19.096
	(2.175)	(0.180)	(0.310)	(2.489)	(4.244)
Inward FDIs	-0.558	0.039	0.332	-0.967	-9.964
	(-0.669)	(0.054)	(0.447)	(1.041)	(-3.291)
Technology Transfer	-9.188	-4.717	-5.240	-8.813	12.051
	(-2.219)	(-2.345)	(2.487)	(2.138)	(1.677)
Human Capital	-0.333	0.452	0.389	-0.038	2.166
	(-0.451)	(0.685)	(0.651)	(0.057)	(0.525)

Note: Numbers in parentheses () are t-statistics.

The SURE and SEM Mediation estimators provide quite similar inferences for the mediation effects as in the baseline model. MPC, PD, PI, and TT channels hold almost the same relation with economic growth. The main change observed in the mediation effect is the disappearance of statistical significance in the PD and PI channels. The effects through inward FDIs and HC are once again statistically insignificant. Therefore, according to these alternative estimation techniques, only the TT channel is found statistically significant. Meanwhile, MPC comes close to being a significantly positive channel at a 90% confidence level. Statistical insignificance of these channel effects occurred mainly due to insignificances in channel variables in the growth equation. Coefficient estimates under both these estimation techniques are, however, considered biased due to endogeneity.

When the model specifications were adjusted to account for time-invariant region-specific fixed effects, channel effects provide similar coefficient estimates in terms of their signs and magnitudes. However, the coefficient of MPC significantly reduced and became statistically insignificant as these fixed effects may account for some part of the region's political and policy issues. Channel effects for the restricted sample depict some significant variations from the baseline model. When the sample is limited only to developing countries, the magnitude of all the channel variables increased, and the signs of MPC, TT, and HC channels changed. The coefficient of MPC depicts a negative value and is almost significant at a 95% confidence level with a higher magnitude. It became negative because of the negatively significant SAFTA coefficient in the channel equation. This indicates that SAFTA significantly reduces MPC, which affects inversely the economic growth of these developing countries. Long-lasting political tension between India and Pakistan, and some other inner state political and democracy issues in these countries may have led to this result. Inward FDIs channel became statistically significant. However, the coefficient still holds a negative value as the effect of the channel in the growth equation is negative. The TT channel sign changes from negative to positive and is statistically significant at a 90% confidence level. This indicates that the benefits of SAFTA by way of TT realize as and when the countries improve their economic development status. The HC channel sign also changes from negative to positive, but it is still statistically insignificant.

Conclusion

The study results conclude the dynamic efficiency of SAFTA because it improves several macroeconomic factors of the region. This enlightens the worth of bringing SAFTA to its full potential because it can stabilize the region's macroeconomic policies, reduce price distortion, encourage physical investments, attract FDIs, and further technology transmission. Though, theoretically, a human capital growth effect was expected, SAFTA fails in this regard. Even though SAFTA leads to open up several sources of human capital development, insufficiency in secondary and tertiary education among these countries' labor force may have failed in grabbing the opportunities of development. Thus, policymakers should realize this issue and need to develop supportive policies to attract the potential economic benefits of SAFTA.

Macroeconomic policy credibility and physical investment are the two macroeconomic factors that significantly carry the positive growth effects of SAFTA. However, other channel effects were found either negative or insignificant in caring for the growth effects. Price distortion depicts a negatively significant channel effect for SAFTA. This negative channel effect is due to the positive effect of price distortion on economic growth. This indicates that prevailing price distortion within the region positively affects the region's economic growth, contrary to theory. Thus, policymakers need to concentrate on it because distortions in price would lead to so many other hindrances. Technology transfer, which is peroxided by the share of manufactured exports in merchandise exports, is also found as a highly undesirable channel as its direct effect on economic growth depicts a negative coefficient.

On the one hand, the declining trend is shown in the region's share of manufactured exports, and on the other hand, trade policies, which show the characteristics of import substitution under protection, may have led to this inverse relationship. Therefore, policymakers should consider more about export promotion than import substitution when implementing the region's trade strategy. That would also attract the interest of multinational companies, who consider South Asia an export destination. The economic growth effects of SAFTA through human capital development are also insignificant. The lack of secondary or tertiary education among the labor force is the main reason because it shuts human capital development avenues down. Therefore, policymakers' involvement in uplifting education among the labor force is essential.

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