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Is the Value Addition in Services and Manufacturing Complementary? Empirical Evidence from SAARC

Mirajul Haq,[*] Syed Kafait Hussain Naqvi,[**] and Muhammad Luqman[***]

Abstract

Most empirical studies on sectoral change provide evidence in favor of the complementarities between manufacturing and services, claiming that both sectors generally grow in parallel. This study investigates the complementarities hypothesis for the SAARC countries, which have dominant services sectors but have not graduated to industrial status. We ask whether the rapid growth and value addition of services presents an opportunity or threat for value addition in manufacturing, when the latter sector is still at a premature stage. Our findings do not validate the complementarities between manufacturing and services overall in the case of the SAARC countries. However, there appear to be potential complementarities once services is interacted with trade variables.

Keywords: Manufacturing sector, services sector, economic growth, SAARC.

JEL classification: N65, O14, O47.

1. Introduction

Rostow's (1960) last stage of economic growth[1] is characterized by high mass consumption and a dominant services sector. However, most developing countries feature a dominant services sector despite being far removed from the high mass consumption stage. The literature on structural change tends to explain this phenomenon in terms of the

[*] Assistant Professor, International Institute of Islamic Economics, International Islamic University, Islamabad, Pakistan.
[**] Visiting Faculty, Kashmir Institute of Economics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan.
[***] PhD Scholar, Pakistan Institute of Development Economics, Islamabad, Pakistan.

[1] The first stage indicates a traditional society and agricultural economy. In the second stage, the economy moves toward infrastructure development and specialization. In the third stage, industrialization increases with workers switching from agriculture to manufacturing. The fourth stage enables maturity and diversification: technological innovations provide diverse investment opportunities, the economy produces a wide range of goods and services, and there is less reliance on imports. In the fifth stage, the economy is geared toward mass consumption: consumer durable industries flourish and the services sector becomes increasingly dominant.

complementary role of services in manufacturing value addition and growth, implying that the efficiency of both sectors moves in the same direction. These studies take into account the forward and backward linkages between the sectors. For instance, Blyde and Sinyavskaya (2007) argue that an increase in export manufacturing is strongly linked to the efficiency of the services sector, such that a 10 percent increase in services trading will create a 6 percent increase in commodities trading.

Similarly, Zott and Amit (2010) show that a larger services sector improves value addition in manufacturing: it enables manufacturing firms engaged with the services sector to provide information to producers on market needs. This enlarges the scope of production, resulting in value addition and increasing sales and revenues in manufacturing. Agrawal, Ferguson, Toktay and Thomas (2012) argue that the integration of manufacturing and services strengthens value addition in the production chain. Miroudot, Sauvage and Shepherd (2013) hold that a well-equipped, advanced services sector can fuel growth in other sectors through input and output linkages.

Numerous other studies have looked at sectoral interdependencies in explaining the complementarity between growth and value addition in services and manufacturing.[2] Their central argument is that integration between the two sectors enhances knowledge creation and, therefore, product development and engineering, thereby adding value to the manufacturing sector. However, this study questions whether the same interdependency applies in the case of the South Asian Association for Regional Cooperation (SAARC) bloc, where the services sector has grown rapidly and before the manufacturing sector could mature. We ask if this presents an opportunity or a threat to value addition in manufacturing.

The SAARC countries are very similar with respect to their age as independent economies. They have a common history and social structures, and many of the same economic fundamentals. In recent decades, indicators have pointed to the services sector as the driver of economic growth in most SAARC countries, accounting for about 55 percent of their GDP on average (World Bank, 2012). The employment share of the services sector increased from 20 percent in the 1970s to 45 percent in 2002 (World Bank, 2012). This is also associated with the region's weak industrial base: in the two major SAARC economies, India and

[2] See, for example, Dasgupta and Singh (2005); Cassiman and Veugelers (2006); Pradhan (2003); Porter and Siggelkow (2008); Fink and Molinuevo (2008); Novak and Stern (2009); Arnold, Hoeller, Morgan and Wörgötter (2009).

Pakistan, the contribution of the industrial sector to GDP and employment is still below the world average.

The rapid growth of services long before the manufacturing sector has had a chance to mature has created economic growth pitfalls for the SAARC economies. We test the hypothesis that, in this region, value addition in the services sector has crowded out value addition in manufacturing. The rest of the study is organized as follows. Sections 2 and 3 present our empirical model, datasets, sample and estimation technique. Section 4 examines the empirical findings and carries out robustness checks. Section 5 concludes the study.

2. Empirical Model

We estimate the following baseline model, which draws on Chang, Kaltani and Loayza (2009); Musonera (2007); and Borensztein, De Gregorio and Lee (1998):

$$VAM_{it} = \beta_0 + \beta_1 VAS_{it} + \beta_2 X_{it} + \varepsilon_{it} \quad (1)$$

where VAM_{it} is the dependent variable, manufacturing value-added. On the right-hand side, VAS_{it} denotes services value-added, the variable of interest. Manufacturing value-added is the net output of the sector (the sum of all outputs less intermediate inputs) and comprises the value added in mining, large-scale construction, electricity, water and gas. Similarly, services value-added is the sum of all outputs less intermediate inputs. This incorporates the value added in wholesale and retail (including hotels and restaurants), transport, government services, financial and professional services, and personal services (education, healthcare and real estate).

Both manufacturing value-added and services value-added are measured as a percentage of GDP (see World Intellectual Property Organization, 2000; Bosworth & Collins, 2008; Ilyas, Ahmad, Afzal & Mahmood, 2010). X_{it} is a vector of control variables. This includes physical capital $PhyC_{it}$ – measured by gross fixed capital formation as a percentage of GDP – and human capital HC_{it} – measured by Barro and Lee's (2013) average years of schooling, adjusted for the average Mincerian rate of return. The human capital stock is constructed as the exponentially compounded product of the average years of schooling for the working-age population (15 years and older), adjusted for the global average Mincerian rate of return (9.5 percent) (see Haq & Luqman, 2014). Trade openness TON_{it} is measured as exports plus imports as a percentage of GDP and ε_{it} is the error term.

3. Dataset, Sample Selection and Estimation

We have used longitudinal panel data on five SAARC countries – Bangladesh, India, Nepal, Pakistan and Sri Lanka – for 1980 to 2012. The data is taken from the World Bank's World Development Indicators database, the Penn World Table 7.1, Barro and Lee's (2013) schooling dataset and UN Comtrade (see Table A1 in the Appendix).

As Haq and Luqman (2014) explain, there are several reasons for limiting this analysis to a regional bloc. First, it reduces the possibility of a heterogeneous level of initial technology across countries: Temple (1999) suggests that initial levels of technology are more likely to be similar within a region, but vary between regions. Second, the socioeconomic similarities of the SAARC countries help to avoid the problem of assuming a common intercept in the cross-country regression. Third, these countries have comparable patterns of structural transformation in terms of employment and sectoral shares of GDP (see Figures A1 to A5 in the Appendix). For example, from the 1950s to the 1970s, all five sample countries relied heavily on agriculture, moved toward manufacturing-led growth in the 1980s and shifted rapidly to advanced services in the 1990s. Following the literature on dynamic panel models, we employ the generalized method of moments (GMM) estimation technique developed by Arellano and Bond (1991).

4. Empirical Findings and Interpretation

As mentioned above, the key objective is to investigate the impact of services on value addition in manufacturing. We focus on the value addition of services in the sample countries and the interacting terms.

4.1. Results of Empirical Model

Table 1 gives the results of the empirical model: VAM_{it} is regressed on VAS_{it}[3] along with the control variables. The model is dynamic, with the lagged dependent variable VAM_{t-1} introduced as an explanatory variable. The coefficient of VAM_{t-1} is positive and highly significant in all the specifications of model 1. These lagged values capture the cumulative industrialization process. A number of empirical studies maintain that the existing level of technology can affect the potential gains of new technology and, therefore, a certain level of technology is required to tap into international knowledge and technology.[4]

[3] The data was taken from http://data.worldbank.org/indicator/NV.IND.TOTL.ZS and http://data.worldbank.org/indicator/NV.SRV.TETC.ZS, respectively.

[4] See, for instance, Baumol, Nelson and Wolff (1994); Forbes and Wield (2000); Griffith, Redding and Van Reenen (2003); Keller (2004).

Table 1: Empirical results of baseline model

Variable	Model_1	Model_2	Model_3	Model_4	Model_5	Model_6	Model_7	Model_8	Model_9
VAM_{t-1}	0.579***	0.770***	0.867***	0.045***	0.853***	0.857***	0.810***	0.321**	0.852***
	(0.000)	(0.000)	(0.000)	(0.040)	(0.000)	(0.000)	(0.000)	(0.010)	(0.000)
VAS_{it}	-0.091***	-0.110***	-0.103***	-0.318***	-0.08**	-0.092**	-0.118***	-0.563***	-0.083***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	0.002)	(0.000)	(0.000)	(0.002)
$PhyC_{it}$	0.016**	0.092**	0.068**	0.271***	0.031	0.021**	0.057**	0.359***	0.047**
	(0.031)	(0.003)	(0.031)	(0.002)	(0.387)	(0.049)	(0.057)	(0.000)	(0.013)
HC_{it}	0.009***	0.007**	0.010***	0.422***	0.410***	0.360	0.005**	0.246***	1.950**
	(0.000)	(0.002)	(0.000)	(0.000)	(0.001)	(0.003)	(0.027)	(0.000)	(0.037)
TON_{it}	0.011**								
	(0.013)								
MEM_{it}		0.027***							
		(0.000)							
MIM_{it}			0.012						
			(0.251)						
$IMPC_{it}$				0.982***					
				(0.000)					
$(VAS * TON)_{it}$					(0.080)				
					(0.923)				
$(VAS * MIM)_{it}$						.0001*			
						(0.093)			
$(VAS * MEM)_{it}$							0.0713**		
							(0.001)		
$(VAS * MEM)_{it}$							0.0713**		
							(0.001)		

Table 1: Empirical results of baseline model Continued…

Variable	Model_1	Model_2	Model_3	Model_4	Model_5	Model_6	Model_7	Model_8	Model_9
$(VAS * IMPC)_{it}$								0.009***	
								(0.000)	
$(HC * IMPC)_{it}$									0.006
									(0.237)
Observations	155	155	155	155	155	155	155	155	155
Countries	5	5	5	5	5	5	5	5	5
Instruments	62	60	62	60	60	60	62	62	62
Sargan test p-values	0.148	0.173	0.141	0.131	0.112	0.152	0.146	0.122	0.141
Arellano–Bond test for autocorrelation	-1.94 (0.240)	-1.98 (0.151)	-1.87 (0.712)	-2.393 (0.113)	-1.85 (0.172)	-1.887 (0.14)	-1.88 (0.12)	-2.013 (0.082)	-1.91 (0.140)

Note: p-values given in parentheses; * significant at 10%, ** significant at 5%, * significant at 1%.
The equations have been corrected for heteroskedasticity where needed. The Sargan test determines the validity of instrumental variables in GMM estimation. In all the models, the null hypothesis of the Sargan test (over-identifying restrictions are valid) is not rejected, which shows that the instrumental variables are valid.
Source: Authors' calculations.

Column 2 shows that the variable of interest VAS_{it} has a negative sign (–0.091) and is statistically significant at 1 percent. This implies that the value addition in services and manufacturing moves in opposite directions for this sample. The following reasons may explain why. First, as Kiley (2001) and Bresnahan (2003) argue, new technology in services requires the production process to be reorganized. The replacement of technology, therefore, becomes costly for services companies, especially at the initial stage. The second factor is the speed of shock adjustment in sectoral income, which may be far higher in the manufacturing sector compared to the services sector. Third, the negative sign of own-industry services investment may be due to the "business stealing" effect, whereby firms that find new and more efficient applications of services will have a negative effect on the productivity of their competitors in manufacturing (Bloom, Schankerman & Van Reenen, 2013). Overall, in the case of the selected SAARC countries, we cannot accept the hypothesis that value addition in services and manufacturing moves in the same direction. This implies a lack of complementarity between the two sectors and indicates that value addition in services may present a threat, rather than an opportunity, for value addition in manufacturing in SAARC.

All the control variables in the baseline specification have the expected signs and are statistically significant. Physical capital $PhyC_{it}$ (model 1) has a positive sign and is statistically significant. This result is in line with Bigsten et al. (2000), Dasgupta and Singh (2006) and Rajni (2013), supporting the claim that an increase in the stock of physical capital enhances the production capacity of individual firms, in turn increasing overall sectoral growth. The coefficient of human capital HC_{it} also has a positive sign and is statistically significant, indicating that an increase in workers' human capital enhances their production capacity, in turn increasing firms' productivity. This result is consistent with Romer (1989), Becker (1993), Bakare (2011) and Olayemi (2012).

Trade openness TON_{it} has a positive sign (0.011), denoting its positive impact on value addition in manufacturing. This finding is supported by Ellahi, Mehmood, Ahmad and Khattak (2011), who show that trade openness and manufacturing value-added have a sustained and positive relationship. By extension, the result is also in line with Guisan and Exposito (2004), who find that the liberalization of imports has a positive impact on manufacturing growth.

Columns 3 to 10 give the results of the sensitivity analysis. It is important to clarify that VAM_{t-1}, VAS_{it}, $PhyC_{it}$ and HC_{it} are common to all

the specifications. In model 2 (column 3), all the variables, including VAS_{it}, yield the same results as for model 1. In this specification, we replace TON_{it} with MEM_{it}, denoting export manufactures[5] as a percentage of merchandise exports.[6] MEM_{it} affects manufacturing value-added through two channels. First, an increase in the export of manufactured goods creates competition among domestic producers, in turn improving the quantity and quality of manufactures. Second, an increase in export manufactures creates fiscal space for producers to expand their research and development (R&D) capacity. This raises the sector's level of invention and innovation (Boggio, 1988; Rivera-Batiz & Romer, 1991a, 1991b; Lucas, 1993).

MEM_{it} is significant and positive (0.027), implying that the value addition in manufacturing rises in tandem with an increase in the sector's share of total exports. This is because (i) any modification of technology associated with higher exports increases the profits of production units, in turn stimulating firms' investment in new technology and R&D; and (ii) access to export markets provides an opportunity for learning, which improves the quantity and quality of production.

In model 3 (column 4), we replace MEM_{it} with MIM_{it}, denoting import manufactures as a percentage of merchandise imports. The variable has a positive sign, but is not significant. This may be associated with the nascent structure of the manufacturing sector in the selected SAARC countries. Model 4 (column 5) follows Blyde and Sinyavskaya (2007) and Mayer (2001) and incorporates the impact of the type of manufactured goods being imported. The import of machinery and transport equipment play a significant role in manufacturing value-added (Mayer, 2001). In specification 4, we replace MIM_{it} with $IMPC_{it}$, denoting imports of machinery and transport equipment as a percentage of merchandise imports. $IMPC_{it}$ has a positive and relatively strong coefficient (0.982) that is significant at 1 percent. This reveals that, instead of overall imports, imports of machinery and transport equipment play an important role in manufacturing value-added.

Specifications 5–8 (columns 6–9) give the regression results for complementary reforms, incorporating the interaction between services value-added and different trade variables. Model 5 examines the complementarity between services value-added and trade openness, using the interaction term $(VAS * TON)_{it}$. The coefficient of this interaction is

[5] According to UN Comtrade, export and import manufactures comprise commodities, chemicals, basic manufactures, machinery and transport equipment, and miscellaneous manufactured goods.
[6] Merchandise exports and imports are a country's exports and imports of tangible goods.

positive, but not statistically significant. Next, we add the interaction between services value-added and import manufactures $(VAS * MIM)_{it}$, which has a positive sign and is significant at 1 percent. This indicates that the value-added effect of an increase in services on manufacturing value-added depends positively on import manufactures. That is, any value addition in services leads to a large increase in manufacturing value-added when countries are more open to importing manufactures.

Model 7 (column 8) presents the results of a third interactive term, $(VAS * MEM)_{it}$, which is positive and significant. This signifies that sectoral structures should change in favor of adding value to manufacturing by liberalizing the export of manufactured goods. Similarly, model 8 (column 9) measures the impact of the interaction between services value-added and imports of machinery and transport equipment $(VAS * IMPC)_{it}$. The coefficient of this interaction term is statistically significant and has a positive sign. This shows that the value addition effect of an increase in services value-added on manufacturing depends positively on the increase in imports of machinery and transport equipment (enhanced through complementary trade reforms).[7]

Three arguments support the claim that greater openness in the import and export of manufactures increases the value added to the manufacturing sector. First, adapting advanced technology – given that the sample countries rely on imported technology – is associated with the liberalization of import manufactures. This enables the importing country to enhance its technological capacity and shift from being a producer and exporter of primary products to a producer and exporter of value-added (manufactured) products. Second, the liberalization of export manufactures increases the fiscal space of production firms and stimulates their investment in new technology and R&D. Third, access to international markets provides an opportunity for learning, which improves the quantity and quality of production units.

The extent to which a country's manufacturing value-added will gain from imported technology is also sensitive to the country's capacity for absorbing this technology into its production process. To evaluate the impact of the absorption capacity on manufacturing value-added, we employ the interaction between human capital and imports of machinery and transport equipment $(HC * IMPC)_{it}$. The last column (specification 9)

[7] Chang et al. (2009), Fiori, Nicoletti, Scarpetta and Schiantarelli (2007), and Stieglitz and Heine (2007) use interaction terms, defining complementarity and substitutability based on the variable's sign.

presents the results of this interaction: the term is statistically significant and has the expected positive sign. This implies that the value addition effect of an increase in imported capital depends positively on the progress made in human capital. This result is in line with Keller (1998), who argues that developing countries utilize international technology more efficiently if local firms are carrying out R&D. Moreover, as Mayer (2001) points out, differences in human capital and machinery imports can also explain productivity differences across developing countries.

4.2. Robustness Checks

Instead of conventional cross-sectional regressions, we have used a dynamic panel model and GMM estimator. This provides consistent and asymptotically normal estimates as it eliminates the biases caused by omitted variables, endogenous right-hand-side variables, the omission of initial efficiency and the presence of measurement errors. It is important to note that, to control the problem of endogeneity, we use a GMM estimator with the lagged values of the dependent variables as instruments. To avoid upward biased coefficients, we limit the number of lags to two.

To verify the validity of the empirical estimates, we apply the following diagnostic tests. The Wald test measures the joint hypothesis of coefficients, where the null hypothesis is that all the regressor coefficients are 0 simultaneously. In this case, the probability of obtaining the given values of F or above are almost 0 in most of the specifications. This shows that the explanatory variables account for a significant proportion of the variability of the dependent variable in each specification (Table 2).

Table 2: Wald test for joint significance

	Model_1	**Model_2**	**Model_3**	**Model_4**	**Model_5**
F-value	3.720	4.820	27.010	26.710	3.430
P-value	(0.031)	(0.078)	(0.000)	(0.000)	(0.013)

Note: H0 = all the regressor coefficients are 0 simultaneously.
Source: Authors' calculations.

The Pesaran (2004) test gauges the cross-sectional dependence of the residuals across countries, where the null hypothesis is that the residuals are not correlated. In all the specifications, the null hypothesis is not rejected (Table 3). Finally, the Sargan (1958) test is used to verify the validity of the instrumental variables in the GMM estimation. The null

hypothesis – that over-identifying restrictions are valid – is not rejected, which indicates that the instruments are correctly specified.

Table 3: Pesaran test for cross-sectional dependence

	Model_1	Model_2	Model_3	Model_4	Model_5	Model_6
F-value	4.200	-2.700	27.010	-1.568	-0.717	-0.717
P-value	(0.126)	(0.472)	(0.618)	(0.116)	(0.473)	(0.381)

Note: H0 = residuals are not correlated ($p > 5\%$).
Source: Authors' calculations.

Tables A2 and A3 in the Appendix provide the correlation matrix results and panel unit root test results. Tables A4 and A5 present the study's results for the OLS regression model and time fixed-effects model.

5. Conclusion

Although much of the empirical literature on sectoral shifts supports the notion of complementarities between manufacturing and services – arguing that both sectors move in the same direction – we contend that this hypothesis warrants further investigation in countries that have a dominant services sector, but have not graduated to industrial status. Accordingly, this study tests the hypothesis that value addition in the services sector crowds out value addition in manufacturing. Our sample of five SAARC countries all have a dominant services sector, but have not achieved industrial status. The empirical evidence shows that any value addition in services is significantly and inversely associated with value addition in the manufacturing sector. Hence, our findings do not support the idea of complementarities between manufacturing and services overall in the case of the selected SAARC countries.

However, when the services regressor interacts with different trade variables, we find some evidence of complementarity. For instance, unlike the individual term, the interaction term for trade openness and services value-added has a positive sign. We also find that the interaction terms for services value-added and export manufactures, and for services value-added and import manufactures are positive and statistically significant. These findings imply that, the more open an economy is to international trade, the more the services sector is likely to support value addition in the manufacturing sector.

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Appendix

Table A1: Variables and data sources

Variable	Description	Source	Measurement
VAM_{it}	Value added in manufacturing	WDI	Percent of GDP
VAS_{it}	Value added in services	WDI	Percent of GDP
$PhyC_{it}$	Gross fixed capital formation	WDI	Percent of GDP
HC_{it}	Average years of schooling	Barro and Lee (2013)	Unit
TON_{it}	Trade openness	WDI	Total trade percent of GDP
MEM_{it}	Export manufactures	WDI	Percent of merchandise exports
MIM_{it}	Import manufactures	WDI	Percent of merchandise imports
$IMPC_{it}$	Imports of machinery and transport equipment	UN Comtrade	Percent of merchandise imports

Note: WDI = World Development Indicators dataset.

Table A2: Correlation matrix results

Variable	VAS_{it}	VAM_{it}	GFC_{it}	AYS_{it}	MEM_{it}	MIM_{it}	TON_{it}
VAS_{it}	1.0000						
VAM_{it}	0.6714	1.0000					
GFC_{it}	0.2907	0.5722	1.0000				
AYS_{it}	0.5939	0.6271	0.5242	1.0000			
MEM_{it}	0.3521	0.1299	-0.1621	-0.0788	1.0000		
MIM_{it}	-0.0342	-0.0589	0.0436	0.3895	0.0415	1.0000	
TON_{it}	0.2436	0.3250	0.5171	0.7754	-0.1810	0.3990	1.0000

Source: Authors' calculations.

Table A3: Panel unit root test results

	VAM_{it}	VAS_{it}	$PhyC_{it}$	HC_{it}	TON_{it}	MEM_{it}	MIM_{it}	$IMPC_{it}$
PP-Fisher chi-sq.	18.065	16.860	12.771	16.318	10.232	22.254	20.18	20.402
Prob.	(0.0724)	(0.088)	(0.237)	(0.091)	(0.423)	(0.013)	(0.027)	(0.0257)

Note: H_0 = presence of a unit root.
Source: Authors' calculations.

Table A4: Pooled OLS results

Dependent variable = value added in manufacturing as a percentage of GDP

Variable	Model_1	Model_2	Model_3	Model_4	Model_5	Model_6
VAM_{t-1}	0.991***	1.003***	0.980***	0.931***	1.002***	1.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VAS_{it}	-0.201*	-0.298**	-0.183**	-0.214*	-0.297*	-0.302**
	(0.092)	(0.024)	(0.034)	(0.061)	(0.071)	(0.029)
$PhyC_{it}$	0.152**	0.196**	0.222***	0.173***	0.192***	0.193**
	(0.014)	(0.036)	(0.000)	(0.000)	(0.001)	(0.034)
HC_{it}	0.612***	0.488*	0.235***	0.326**	0.002	0.557
	(0.000)	(0.079)	(0.000)	(0.042)	(0.731)	(0.115)
TON_{it}	0.042**					
	(0.022)					
MEM_{it}		0.014*				
		(0.093)				
MIM_{it}			0.980***			
			(0.000)			
$(VAS * TO)_{it}$				0.582		
				(0.742)		
$(VAS * MIM)_{it}$					0.001**	
					(0.023)	
$(VAS * MEM)_{it}$						0.004***
						(0.000)
R^2	0.96	0.96	0.91	0.94	0.95	0.95
Adj. R^2	0.95	0.95	0.90	0.93	0.94	0.94
SE of reg.	0.86	0.87	1.28	0.92	0.88	0.88
Durbin–Watson stat	1.99	1.85	1.09	1.93	1.85	1.83

Note: p-values in parentheses. *, **, *** = significant at 10, 5 and 1%, respectively.
Source: Authors' calculations.

Table A5: Time fixed-effects results

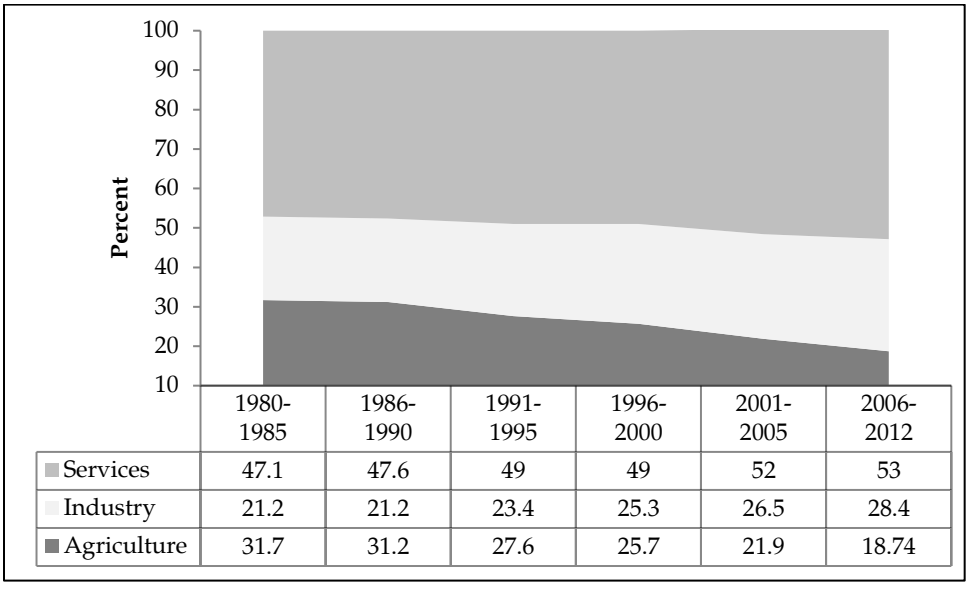
Dependent variable = value added in manufacturing as a percentage of GDP

Variable	Model_1	Model_2	Model_3	Model_4	Model_5	Model_6
VAM_{t-1}	0.927**	0.928**	0.0832***	0.931***	0.955***	0.936***
	(0.033)	(0.027)	(0.000)	(0.000)	(0.000)	(0.001)
VAS_{it}	-0.013**	-0.012**	-0.002***	-0.004*	-0.006	-0.067***
	(0.021)	(0.011)	(0.000)	(0.084)	(0.851)	(0.000)
$PhyC_{it}$	0.028**	0.046**	0.009	0.034**	0.011*	0.043**
	(0.009)	(0.022)	(0.462)	(0.051)	(0.081)	(0.025)
HC_{it}	0.171*	0.115**	0.017*	0.119***	0.351*	0.122*
	(0.049)	(0.041)	(0.091)	(0.001)	(0.071)	(0.093)
TON_{it}	0.037**					
	(0.007)					
MEM_{it}		0.036***				
		(0.011)				
MIM_{it}			0.009			
			(0.831)			
$(VAS * TO)_{it}$				0.375*		
				(0.067)		
$(VAS * MIM)_{it}$					0.205*	
					(0.084)	
$(VAS * MEM)_{it}$						0.074***
						(0.000)
R^2	0.96	0.96	0.96	0.96	0.95	0.96
Adj. R^2	0.95	0.94	0.94	0.95	0.94	0.94
SE of reg.	0.94	0.92	0.96	0.95	0.95	0.92
Durbin–Watson stat	1.86	1.98	1.89	1.86	1.85	1.96

Note: p-values in parentheses. *, **, *** = significant at 10, 5 and 1%, respectively.
Source: Authors' calculations.

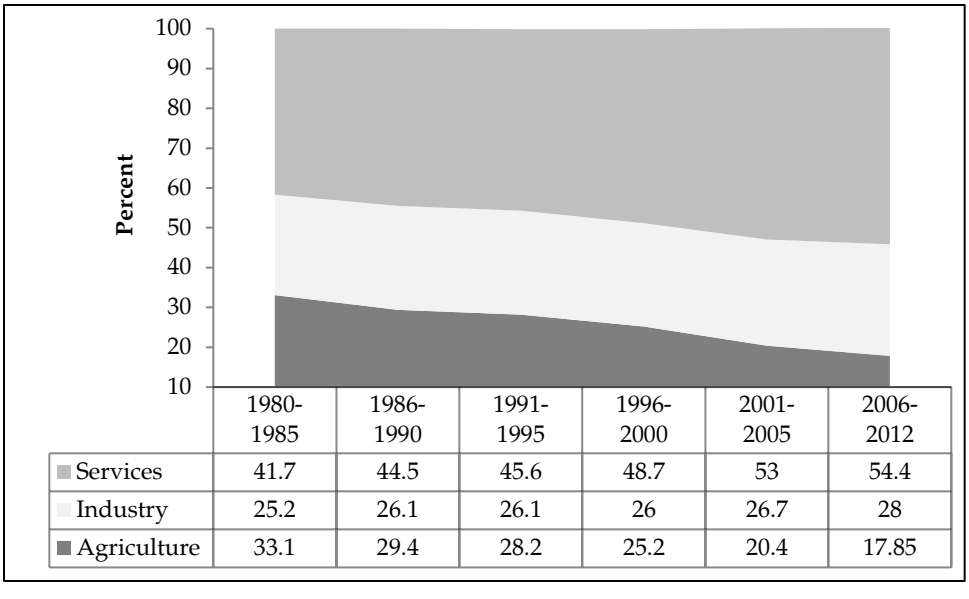
Sectoral composition of SAARC countries

Figure A6: Bangladesh



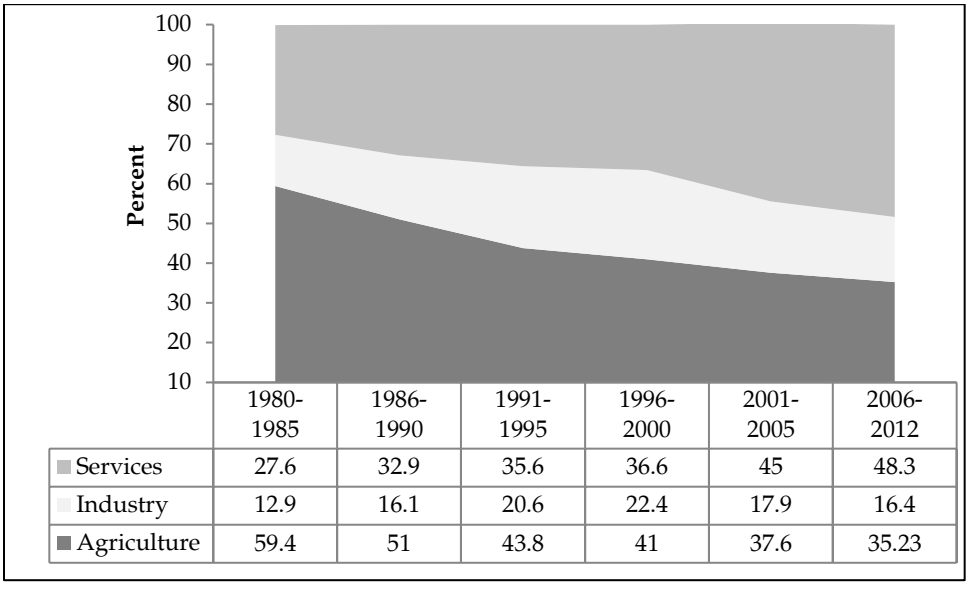
	1980-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2012
Services	47.1	47.6	49	49	52	53
Industry	21.2	21.2	23.4	25.3	26.5	28.4
Agriculture	31.7	31.2	27.6	25.7	21.9	18.74

Figure A7: India



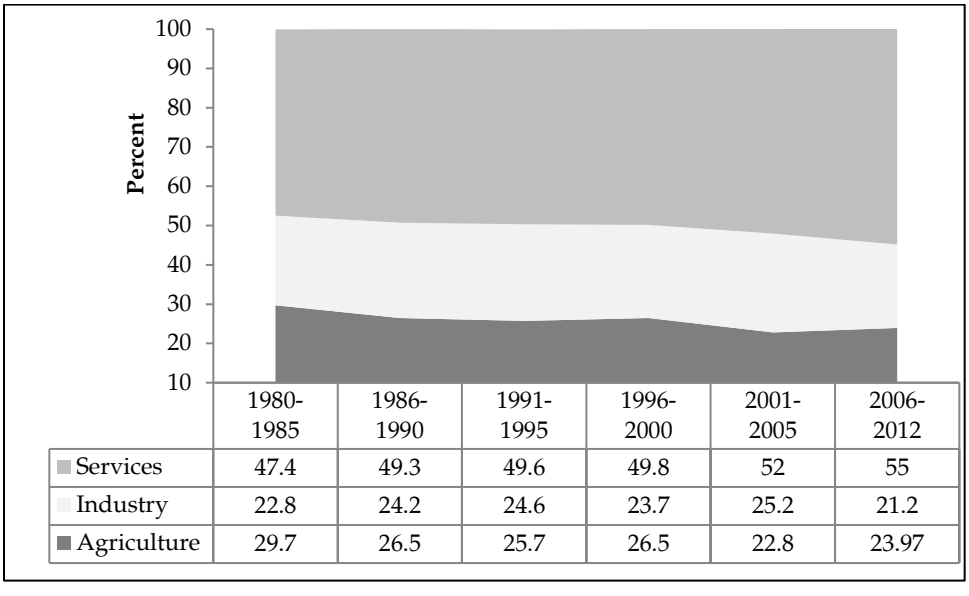
	1980-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2012
Services	41.7	44.5	45.6	48.7	53	54.4
Industry	25.2	26.1	26.1	26	26.7	28
Agriculture	33.1	29.4	28.2	25.2	20.4	17.85

Figure A8: Nepal



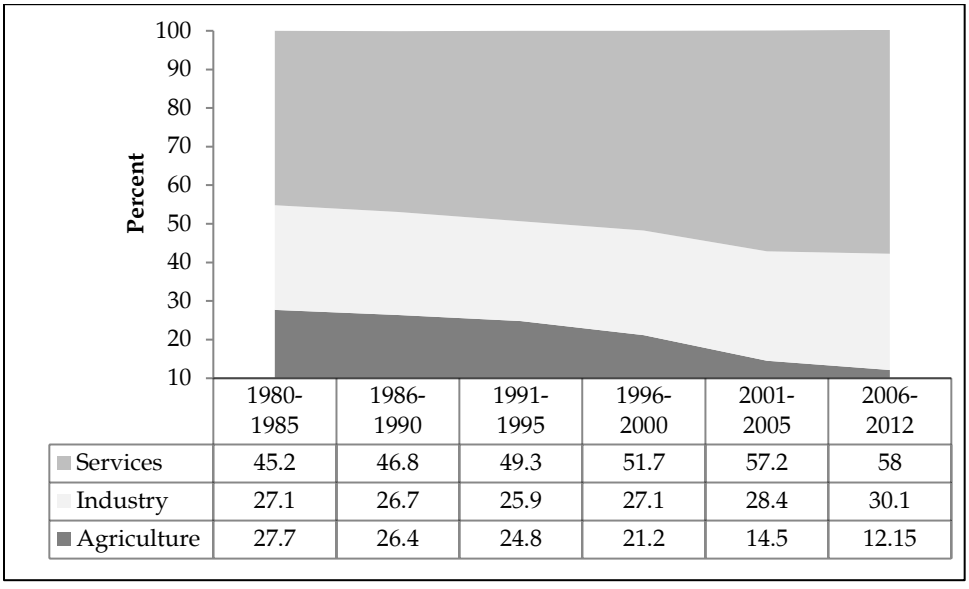
	1980-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2012
Services	27.6	32.9	35.6	36.6	45	48.3
Industry	12.9	16.1	20.6	22.4	17.9	16.4
Agriculture	59.4	51	43.8	41	37.6	35.23

Figure A9: Pakistan



	1980-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2012
Services	47.4	49.3	49.6	49.8	52	55
Industry	22.8	24.2	24.6	23.7	25.2	21.2
Agriculture	29.7	26.5	25.7	26.5	22.8	23.97

Figure A10: Sri Lanka



	1980-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2012
Services	45.2	46.8	49.3	51.7	57.2	58
Industry	27.1	26.7	25.9	27.1	28.4	30.1
Agriculture	27.7	26.4	24.8	21.2	14.5	12.15

Source: World Development Indicators.