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A Comparative Study on Foreign Aid and Growth in Six South Asian Countries

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A B S T R A C T

This study empirically examines and compares the impact of foreign aid on growth in 6 South Asian countries: Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka, using annual data over the period 1980–2019. The empirical results for comparative analysis are based on the methods of variance decomposition and impulse response function. The results show that the impact of foreign aid shock on the growth variation is about 1%–2% in 5 countries and 7.76% in Nepal. This means that the endogenous relationship between foreign aid and growth is not large in 6 South Asian countries. In addition, a foreign aid shock has a positive impact on growth in Bhutan and India, and has a negative impact on growth in other countries. A possible reason for the positive impact in Bhutan and India is that these countries have better governance and transparency than other South Asian countries. Further, the shock of foreign aid on the fluctuation of growth disappears in 2–3 years at the most, suggesting that most foreign aid is ineffectively managed and used for consumer goods. Therefore, it is necessary to improve governance and transparency so that foreign aid can be positively linked to growth, and it is desirable to provide foreign aid in the form of increasing capital goods.

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1. Introduction

After World War II, international cooperation started for economic aid to help rebuild the developing countries through various doctrines, such as Marshall Plan and Molotov Plan. That is, foreign aid has been provided in many forms by bilateral or multilateral development organizations under the headings of social, economic, and productive sectors. The amount of foreign aid inflows has drastically expanded in developing countries since the 1970s, from $49.67 billion in 1970 to $162.78 trillion in 2017 (World Bank).

It is generally known that foreign aid enables host countries to secure investment, adopt new technologies, create employment opportunities, and develop knowledge, expertise and infrastructure. However, if countries receiving foreign aid have poor governance, aid can play a negative role in growth (Dollar & Pritchett, 1998; Hoebink, 2006; Kaya & Kaya, 2020; Ouedraogo et al., 2021). Many empirical studies analyzing the impact of foreign aid on growth presented controversial results. For example, some studies suggested that foreign aid to developing countries is helpful for growth (Dalgaard et al., 2004; Karras, 2006; Yontcheva & Masud, 2005), while others have observed that the impact is negative (Girma, 2015; Javid & Qayyum, 2011; Mallik, 2008; Pedersen, 1996)[3]. Some politicians have even argued that foreign aid is used as a tool for political and trade intervention by donor agencies and countries. Hence, the debate about the influence of foreign aid on growth is still an unresolved issue.

South Asian countries are recognized as the countries receiving the most foreign aid due to the lack of domestic capital. They rely heavily on foreign capital to accelerate the process of economic growth. The purpose of this paper is to analyze the impact of foreign aid on growth in 6 South Asian countries: Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka for which time series data for 1980–2019 are available. In other words, this study aims to provide empirical evidence by comparatively analyzing possible different impacts of foreign aid on growth for each of the 6 South Asian countries. Specifically, the empirical analysis uses a vector auto-regression model or a vector error correction model, where ODA (official development assistance) and real GDP per capita are used as proxy variables for foreign aid and growth, respectively.

The remainder of this paper is organized as follows. Section II examines the literature review. Section III describes the empirical methodology, including data description and empirical specifications. Section IV provides empirical results and plausible implications. Section V is about conclusion and discussion.

[3] On the other hand, Pradhan and Phuyal (2020), Rahnama et al. (2017), and Veiderpass & Andersson (2007) addressed that the impact of foreign aid on growth was ambiguous and/or inconsistent results. A more detailed examination of the existing literature is provided in the next section.

2. Literature Review

It is well known that foreign aid constitutes an important instrument to reduce poverty and promote economic development, especially in developing countries. In addition, external finance is more important than regional investment in the early stages of economic development because it promotes technological progress and infrastructure expansion that accelerates economic growth[4]. Hence, a series of existing studies have addressed the positive relationship between foreign aid and growth (Arndt et al., 2011; Burnside & Dollar, 2000; Dalgaard et al., 2004; Karras, 2006; Levy, 1988; Minoiu & Reddy, 2010; Papanek, 1973; Yontcheva & Masud, 2005). However, other studies argued that foreign aid can be associated with the aid dependency syndrome, encouragement of rent seeking or corruption, Dutch disease and the crowding-out of local investments (Bauer,1972; Collier & Dollar, 2004; Gong & Zou, 2001; Mallik, 2008; Moyo, 2009), meaning that foreign aid has a negative impact on growth.

The existing literature on empirical analysis also provided inconsistent results. That is, a series of studies used a variety of data and methodologies to determine whether a positive relationship exists between foreign aid and growth. For example, Dalgaard et al. (2004) showed that foreign aid has a positive impact on productivity based on a simple theoretical model and cross-country analysis. Karras (2006) Minoiu & Reddy (2010), and Yontcheva & Masud (2005) provided empirical analyses that foreign aid promotes economic growth through various transitional mechanisms using cross-country panel data.

In addition, a bulk of studies analyzed the positive relationship between foreign aid and growth using time series data for a specific developing country (Adebayo & Kalmaz, 2020; Bhattarai, 2009; Fasanya & Onakoya, 2012; Gounder, 2001; Javid & Qayyum, 2011; Jeke et al., 2022; Sharma & Bhattarai, 2013; Sothan, 2018). For example, Bhattari (2009), Gounder (2001), Javid & Qayyum (2011), and Sothan (2018) estimated that foreign aid had a positive impact on growth using time series data for Nepal, Fiji, Pakistan, and Cambodia, respectively. Recently, Adebayo & Kalmaz (2020) re-examined the interconnection between foreign aid and growth in Nigeria, employing time series data covering the period 1980–2018, and confirmed that economic growth is significantly influenced by foreign aid in the long–run using a wavelet coherence technique. Jeke et al. (2022) investigated the relationship between foreign aid and growth in the Democratic Republic of Congo, employing ARDL bound test for the period 1980-2019, and found that foreign aid has a positive and significant impact on growth in the short- and long-run.

Meanwhile, other studies have observed that foreign aid has negative, mixed, and/or ambiguous impacts on growth (Girma, 2015; Hoda, 2013; Javid & Qayyum, 2011; Pedersen, 1996; Pradhan & Phuyal, 2020; Rahnama et al., 2017; Sethi et al., 2019; Veiderpass & Andersson, 2007). For instance, Girma (2015), Hoda (2013), and Javid & Qayyum (2011) estimated that foreign aid had a negative impact on growth using time series data for Ethiopia, Egypt, and Pakistan, respectively. Moreover, Sethi et

[4] Refer to Benarroch and Gaisford (2004) and Jena and Sethi (2020).

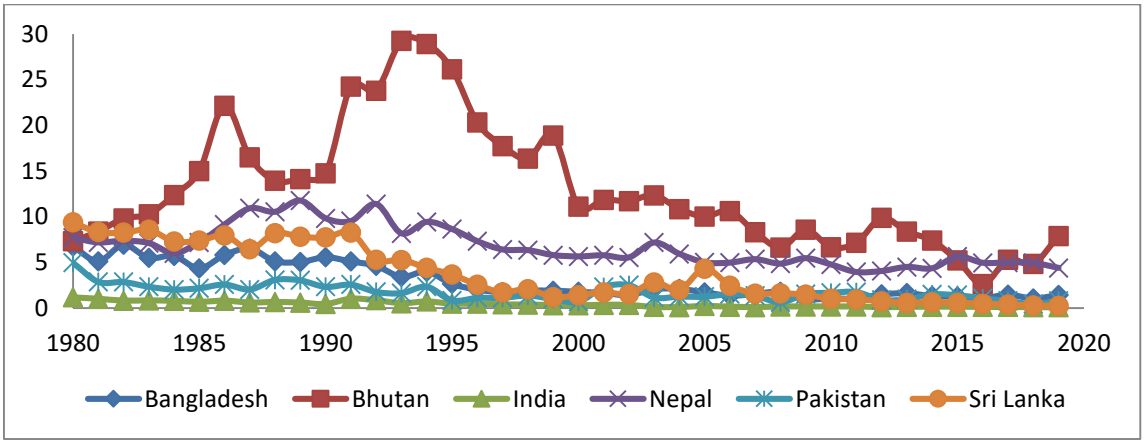
al. (2019) analyzed time series data for Sri Lanka and India, and found that foreign aid to India helped growth, but foreign aid to Sri Lanka did not significantly affect growth. Using a cross-section of developing countries, Rahnama et al. (2017) and Veiderpass & Andersson (2007) concluded that foreign aid had an inconclusive or mixed impacts on growth[5]. Recently, Appiah-Otto et al. (2022) analyzed 37 African countries over the period 2002-2018 using instrumental variables to mitigate endogenous problems, and explored that aid impedes growth.

Hence, the impact of foreign aid on growth is still unclear or ambiguous. This is because its impacts depend not only on the composition of foreign aid, but also on the economic and social conditions of the recipient countries. This study aims to identify the relationship between foreign aid and growth for 6 South Asian countries performed by each country in the existing literature, and to execute a comparative analysis to find the plausible explanations for the different impacts of foreign aid on growth from an economic point of view.

3. Data and Empirical Model

This paper uses a vector autoregression (VAR) or vector error correction (VEC) model with three variables from the data of 6 South Asian countries for the period 1980–2019[6]. The three variables consist of real GDP per capita (henceforth, PGDP), foreign aid (henceforth, AID), and total capital formation (henceforth, GCF), and all data are obtained from World Development Indicators provided by the World Bank. The AID and GCF are measured as a percentage of GNI and GDP, respectively, whereas PGDP is denoted in the constant 2010 US$. Particularly, AID refers to the official development assistance (ODA), which is the transfer of resources from the official sector to developing countries in the form of grants and loans at concessional financial term.

Figure 1. Net ODA Received (% of GNI) by Country



Source: World Bank

[5] Yiew and Lau (2018) showed an inverted U–shape relationship between foreign aid and growth using the sample of 95 developing countries.

[6] As mentioned earlier, the selection of 6 South Asian countries is based on data availability.

Figure 1 shows how net ODA received in 6 South Asian countries changed over time. Although there are differences in the size of ODA by country, it has generally been declining since the mid-1990s in all countries. As of 2019, ODA received by Bhutan is about 8% of GNI, and the rest of the countries are less than 5%. In particular, ODA received by India is less than 1% of GNI, which is the lowest among the 6 countries.

The VAR model is used to analyze the relative importance of various dynamic impacts that influence macroeconomic variables (Bernanke, 1986; Sims, 1986). In addition, the empirical analysis is conducted by the methods of variance decomposition and impulse response function, as in Blanchard and Quah (1989). The reduced form of the VAR model takes the following form:

$$X_{it} = \Gamma_1 X_{it-1} + \Gamma_2 X_{it-2} + \cdots + \Gamma_p X_{it-p} + f_i + u_{it} = \Gamma(L) X_{it} + f_i + u_{it}$$

Here, subscripts *i* and *t* denote countries and years, respectively; X_{it} is a 3 × 1 vector including PGDP, AID, and GCF; *L* is a lag operator; $\Gamma(L)$ is a 3 × 3 coefficient matrix; f_i is an unobservable individual effect; and u_{it} is an error term. It should be noted that the above reduced form looks like a panel analysis, but this paper separately analyzes 6 South Asian countries.

To estimate a VAR model, the time series of endogenous variables should be stationary with no cointegration between them. Enders (2003) explained that a VAR model is useful in examining the association among a set of economic variables. All variables in a VAR model are treated symmetrically: each variable has an equation explaining its evolution based on its own lags and the lags of all the other variables in the model. In addition, the resulting estimates can be used for forecasting purposes. On the other hand, if there exists a long–run relationship between the above variables, a VEC model is estimated, and then methods of variance decomposition and impulse response function are performed.

4. Empirical Results

The empirical analysis begins with performing unit root tests to determine the stationarity of time series data. That is, the traditional method of augmented Dickey-Fuller (ADF) test is used to ensure the stationarity requirement of the data. To determine the optimal lags in the unit root tests, it is considered all plausible cases of "intercept," "intercept + trend," and "none" using some selection criterion[7]. Table 1 provides the results of unit root tests, where all variables are non-stationary at levels but are stationary when converted to the first differences, meaning that each variable is integrated of order one (I(1)).

[7] Specifically, 5 types of selection criterion for lag order, such as sequentially modified LR test statistic, final prediction error, Akaike information criterion, Schwarz information criterion, and Hannan-Quinn information criterion are considered. These criteria determine the optimal lag for all 6 countries to be 1.

Table 1. Unit Root Test

Country	Variable	Intercept		Intercept and Trend		None	
		Level	1st Diff.	Level	1st Diff.	Level	1st Diff.
Bangladesh	PGDP	10.23 (1.00)	-0.75 (0.82)	1.53 (1.00)	-7.76** (0.00)	1.48 (0.96)	0.92 (0.90)
	AID	-1.54 (0.50)	-8.23** (0.00)	-2.76 (0.22)	-8.14** (0.00)	0.80 (0.88)	-8.04** (0.00)
	GCF	-0.67 (0.84)	-7.54** (0.00)	-2.39 (0.38)	-4.17* (0.01)	-2.69* (0.01)	-1.62 (0.10)
Bhutan	PGDP	-0.70 (0.84)	-6.65** (0.00)	-2.45 (0.35)	-6.56** (0.00)	8.01 (1.00)	-1.31 (0.17)
	AID	-1.68 (0.43)	-6.70** (0.00)	-2.64 (0.*27*)	-6.79** (0.00)	-0.48 (0.50)	-6.79** (0.00)
	GCF	-2.33 (0.17)	-4.36** (0.00)	-3.63* (0.04)	-4.39* (0.01)	-0.81 (0.36)	-4.45** (0.00)
India	PGDP	3.06 (1.00)	-4.82** (0.00)	-1.29 (0.88)	-6.04** (0.00)	7.81 (1.00)	-0.21 (0.60)
	AID	-0.91 (0.77)	-7.27** (0.00)	-4.33* (0.01)	-8.12** (0.00)	0.55 (0.83)	-7.29** (0.00)
	GCF	0.07 (0.96)	-7.22** (0.00)	-1.21 (0.89)	-7.09** (0.00)	-1.61 (0.10)	-6.71** (0.00)
Nepal	PGDP	1.67 (1.00)	-6.88** (0.00)	-0.82 (0.96)	-7.86** (0.00)	7.81 (1.00)	-0.21 (0.60)
	AID	-0.91 (0.77)	-7.27** (0.00)	-2.50 (0.33)	-7.21** (0.00)	0.55 (0.83)	-7.29** (0.00)
	GCF	0.07 (0.96)	-7.22** (0.00)	-2.07 (0.55)	-7.35** (0.00)	-1.61 (0.10)	-6.71** (0.00)
Pakistan	PGDP	-0.99 (0.75)	-4.05** (0.00)	-2.71 (0.24)	-4.05** (0.02)	2.75 (1.00)	-2.73* (0.01)
	AID	-1.30 (0.62)	-7.60 (0.00)**	-4.16* (0.01)	-4.73** (0.00)	3.07 (1.00)	-6.24** (0.00)
	GCF	0.40 (0.98)	-8.11** (0.00)	-2.48 (0.34)	-8.24** (0.00)	2.16 (0.99)	-7.42** (0.00)
Sri Lanka	PGDP	1.11 (1.00)	-4.16** (0.00)	-1.74 (0.72)	-4.23* (0.01)	11.91 (1.00)	-1.18 (0.21)
	AID	-0.21 (0.93)	-8.25** (0.00)	-2.42 (0.37)	-8.30** (0.00)	2.42 (1.00)	-7.40** (0.00)
	GCF	-2.58 (0.11)	-6.95** (0.00)	-3.42 (0.06)	-6.82** (0.00)	0.09 (0.71)	-7.05** (0.00)

Notes: (i) PGDP = real GDP per capita (US$), AID = foreign aid (% of GNI), GCF = total capital formation (% of GDP), respectively. (ii) *p*-values are provided in parentheses. (iii) * and **: significant at 5% and 1 % significance level, respectively.

Since all variables are determined by I(1), it is necessary to investigate whether there exists a long–run relationship between AID and PGDP. The Johansen (1988) efficient approach is applied to test for the existence of cointegrating relationships, and the results are shown in Table 2. In Bhutan, Nepal, and Sri Lanka, the null

hypothesis is not rejected that there is no cointegrating relationship between AID and PGDP. Hence, the analysis is based on VAR models for Bhutan, Nepal, and Sri Lanka. In addition, there is at least one equation that is cointegrated in Bangladesh, India, and Pakistan, which establishes a long–run relationship between AID and PGDP. This means that the analysis should be performed based on the VEC model in India, Pakistan, and Bangladesh. However, as a result of estimating the VEC models in the above 3 countries, error correction terms appeared to be positive, which shows unstable results against unexpected shocks. Therefore, the analyses of all 6 countries are inevitably based on the VAR models[8].

Table 2. Cointegration Test

Country	H_0	Trace Test		Max-Eigenvalue Test	
		H_1	Statistic	H_1	Statistic
Bangladesh	$\gamma = 0$	$\gamma \geq 1$	46.44** (0.00)	$\gamma = 1$	28.22** (0.00)
	$\gamma \leq 1$	$\gamma \geq 2$	18.21 (0.01)*	$\gamma = 2$	18.20* (0.01)
Bhutan	$\gamma = 0$	$\gamma \geq 1$	19.53 (0.45)	$\gamma = 1$	11.88 (0.55)
	$\gamma \leq 1$	$\gamma \geq 2$	7.65 (0.50)	$\gamma = 2$	7.22 (0.46)
India	$\gamma = 0$	$\gamma \geq 1$	44.12** (0.00)	$\gamma = 1$	29.82** (0.00)
	$\gamma \leq 1$	$\gamma \geq 2$	14.30 (0.07)	$\gamma = 2$	13.83 (0.05)
Nepal	$\gamma = 0$	$\gamma \geq 1$	19.77 (0.43)	$\gamma = 1$	10.23 (0.72)
	$\gamma \leq 1$	$\gamma \geq 2$	9.53 (0.31)	$\gamma = 2$	6.79 (0.51)
Pakistan	$\gamma = 0$	$\gamma \geq 1$	36.43** (0.00)	$\gamma = 1$	28.24** (0.00)
	$\gamma \leq 1$	$\gamma \geq 2$	8.18 (0.44)	$\gamma = 2$	7.99 (0.37)
Sri Lanka	$\gamma = 0$	$\gamma \geq 1$	18.31 (0.54)	$\gamma = 1$	9.62 (0.77)
	$\gamma \leq 1$	$\gamma \geq 2$	8.68 (0.39)	$\gamma = 2$	7.75 (0.40)

Notes: (i) *p*-values are provided in parentheses. (ii) * and **: significant at 5% and 1 % significance level, respectively.

[8] This paper does not provide the estimation results of VAR and VEC models to improve conciseness and readability. Indeed, the estimated results of VAR and VEC models are less relevant to the main point of this paper.

Table 3 reports the results of variance decomposition on PGDP determinations for AID shocks. The results of the 5th period for Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka present that the impacts of the changes in AID on the determination of PGDP are 2.02%, 2.48%, 2.50%, 7.76%, 1.13%, and 2,04%, respectively. That is, the impact of any shocks to AID on the fluctuation of PGDP is 1%–7%, the smallest in Pakistan with 1.13%, and the largest in Nepal with 7.76%. In 5 countries except for Nepal, the shock of PGDP itself determines more than 90% of the PGDP fluctuation[9]. This means that the endogenous relationship between foreign aid and growth is not large in 6 South Asian countries. Nevertheless, when comparing Nepal and Pakistan, it can be seen that the impact of AID shock on growth determination is estimated to vary greatly depending on each country's economic environment.

Table 3. Variance Decomposition

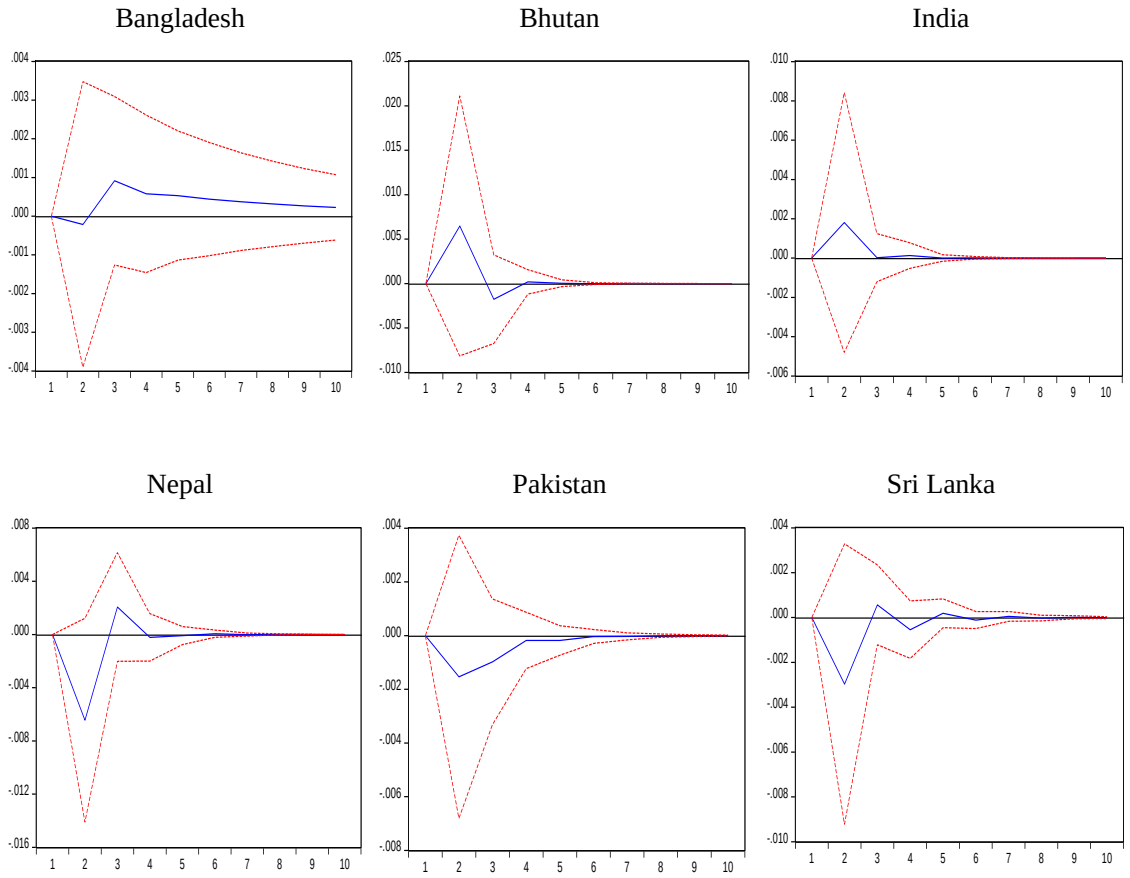
Period	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
1	1.05	2.31	1.20	7.11	0.82	1.91
2	1.60	2.48	2.22	7.76	1.11	1.97
3	1.74	2.48	2.31	7.76	1.11	2.03
4	1.90	2.48	2.33	7.76	1.12	2.03
5	2.02	2.48	2.50	7.76	1.13	2.04

Note: The figures denote the impact of foreign aid shocks on growth fluctuations.

Now, the impulse response function to determine whether AID shock has a positive or negative impact on growth is shown in Figure 2. The impulse response function represents the response of PGDP to a 1 standard deviation shock in AID. The impulse response functions of Bhutan and India suggest that AID shock positively affects growth with a duration of 2–3 years. However, AID shocks in the remaining 4 countries are observed to negatively impact growth. The duration of the impact is about 1 year in Bangladesh and 2–3 years in Nepal, Pakistan, and Sri Lanka. Hence, the impacts of AID changes on PGDP fluctuations vary by country in sign (direction) as well as in magnitude. These results are consistent with the results of existing studies in which the impact of foreign aid on growth was observed to be negative in Pakistan (Javid and Qayyum, 2011) and positive in India (Sethi et al., 2019).

[9] In Nepal, the change in PGDP is determined by 86.02% of the shock of PGDP itself.

Figure 2. Impulse Response Function



Note: Red dots are the confidence intervals of standard error (SE) that are computed as +/- 2 SE confidence bands.

The above results raise several questions as follows. For example, it is necessary to understand why the impact of foreign aid on growth is particularly large in Nepal, and why foreign aid has a negative impact on growth in Bangladesh, Nepal, Pakistan, and Sri Lanka, but positively affects growth in Bhutan and India. It should also explain why the impacts of foreign aid shocks on growth disappear in a relatively short period of time.

Much literature have pointed out that the impact of foreign aid on growth may be related to the governance and corruption of the recipient country (Bräutigam, 2000; Bräutigam & Knack, 2004; Burnside & Dollar, 2000; Dollar & Pritchett, 1998; Kaya & Kaya, 2020). Particularly, Rajan & Subramanian (2007) presented that foreign aid may affect governance, meaning that there exists an endogenous relationship between them. Hence, the existing studies suggested that foreign aid may have a negative impact on economic growth in countries with prevalent corruption and/or poor governance.

The Transparency International provides the corruption perception index on a scale of 0 to 100, with lower ratings signifying less transparency, and its ranking by country, with Bangladesh, Pakistan, Nepal, Sri Lanka, India, and Bhutan ranked 146, 124, 117, 94, 86, and 24 respectively. In addition, the government effectiveness index from 0 (less effective) to 100 (more effective), published by the Worldwide Governance Indicators showed that Bangladesh, Nepal, Pakistan, and Sri Lanka were very poor at 23.56, 14.90, 25.96, and 48.08, while Bhutan (64.90) and India (59.62) demonstrated relatively high levels[10]. The fact that both Bhutan and India have better governance and transparency compared to other countries suggests the possibility of using foreign aid effectively in these countries to have a positive impact on growth. Hence, the governance systems play an important role in the proper utilization of foreign aid for growth.

It is worth noting that an AID shock has a relatively large negative impact on PGDP fluctuation in Nepal. A plausible explanation would be the issue of ineffective support and monitoring problems related to aid management and support conditions. Since Nepal's economy is highly dependent on the primary industry, it can be assumed that foreign aid is difficult to lead to investment. In addition, the impact of foreign aid on growth in all 6 countries only persists in short–run, suggesting that most foreign aid is not used to form capital goods, but rather ends up in consumer goods, as noted in Werker et al. (2009).

Finally, it is verified that model fitness and stability using some residual tests, such as the Breusch-Godfrey serial correlation LM test, heteroscedasticity test, and CUSUM test (or cumulative sum control chart). The results of the LM test and heteroskedasticity test illustrate that the model is free from autocorrelation and heteroskedasticity in all 6 countries. The CUSUM test based on the cumulative sum of recursive residuals shows the stability of parameters.

5. Discussion and Conclusion

This study empirically examines the impact of foreign aid on growth in 6 South Asian countries: Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka, using annual data over the period 1980–2019. Although there exist many studies on the relationship between foreign aid and growth in specific developing countries, this study aims to induce plausible implications by comparing the results of 6 South Asian countries. Specifically, it is comparatively investigated the impact of foreign aid on growth using variance decomposition and impulse response function based on a vector autoregression model.

[10] Data provided by the Transparency International and the Worldwide Governance Indicators may be downloaded from https://www.transparency.org and https://info.worldbank.org/governace, respectively.

The empirical results show that the endogenous relationship between foreign aid and growth is not large in South Asian countries, except for Nepal. That is, the impact of foreign aid shock on the growth variation is about 1%–2% in 5 countries and 7.76% in Nepal. In addition, a foreign aid shock has a positive impact on growth in Bhutan and India, and has a negative impact on growth in other countries. It is followed that the impact persists in 2–3 years at the most. A possible explanation for the positive impact of foreign aid shock on growth fluctuation in Bhutan and India is that these countries have better governance and transparency than other South Asian countries. In addition, the impact of foreign aid on growth is small and short–run, suggesting that these countries may have ineffective management conditions and most foreign aid is spent on consumer goods.

Hence, the impact of foreign aid on growth may vary depending on each country's economic environment. Each country's economic environment can be affected by some public policies. Public policies to increase infrastructure, capital goods, education and health structure are very important for effectiveness foreign aid and growth. In addition, establishing rule of law, good governance is very crucial for effectiveness of foreign aid, and therefore economic growth. For all these infrastructural enhancements, better environment for business, lack of corruption, better human capital, government involvement is necessary. Markets themselves cannot solve these problems.

Public policies in terms of public education and health expenditures, public expenditures for better governance, efficient tax system and sharing the burden of tax system, fairness in sharing the burden of tax, establishing trust to public institutions are very important. For this reason, foreign aid and growth relationship can be more observable in the countries where government and public sector are efficient. A positive link between foreign aid and growth therefore requires improved governance and transparency. It is also desirable to provide foreign aid in the form of increasing capital goods rather than consumer goods. Therefore, it is necessary to accurately examine the impact of foreign aid on growth by controlling governance or transparency and using data on the composition of foreign aid. This is a good topic for future research and will complete this study.

Ethics Committee Approval: It is not a study that requires an ethics committee document.

Peer Review: External independent.

Author Contributions:

Birendra Narayan Shah - Idea, Planning and Design, Literature and Citation, Data Collection, Final Approval and Responsibility, Overall Contribution - 60%.

Jinyoung Hwang - Purpose, Method, Data Analysis and Discussion, Writing and Format, Final Approval and Responsibility, Overall Contribution - 40%.

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