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DOES TRADE MAKE ASIAN CHILDREN HEALTHIER?

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Abstract

This paper empirically examines the impact of globalization and international trade on the child health status of the Asian countries. In contrast to previous studies we have introduced the initial level of development and income status that seem to play an important role. We have also checked whether the impact on child health status of trade in services is different from the trade in goods. The fixed effects panel data analysis shows that economic and political globalization have positive impact on the child health status measured by child mortality rates and malnutrition. International trade across all countries has no impact on child health but when different groups of countries classified by their initial levels of income and development are considered, trade shows significant impact on the child health. Further decomposing the trade, trade in services show more positive impact on the child health status than the trade in goods.

Key Words: Globalization, International Trade, Trade in Services, Child health, Malnutrition, Asia

JEL Classification: I15, F63, O53

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1. Introduction

Post the World War II, world has witnessed integration of national economies into a global economy and improvement in health status. Globalization is vaguely defined as increasing integration of national economies into an overarching world economy (Pang & Guindon, 2004; Ervin & Smith, 2008). But this does not cover the entire meaning and the term may be divided in three distinct but interrelated components: economic, social and political globalization (Keohane & Nye, 2000; Dreher, 2006). In the era of all pervasive globalization, it is important to understand how the integration into global economy impacts the health status of a country. Child health has always been one of the important health and development goals for the world as a whole. It has importance both in terms of human development as well as economic growth. It plays a pivotal role in building human capital for an economy for its future growth. There are conflicting views about how economic globalization has impacted the child health. Some scholars argue that trade liberalization has positive impact on the health (Deaton, 2004; Owen & Wu, 2007) while some oppose it (Cornia, 2001). In this paper we attempt to address two concerns. First, what is the impact of the overall globalization on the child mortality rates- infant mortality rate (IMR) and under five mortality rate (U5M)? Second, what is the impact of international trade on child mortality rates? While, more globalization and trade seem to increase the per capita income (Frankel & Romer, 1999) that may result in better health outcome, it becomes an important empirical question to check whether it really happens or not in the wake of negatives attached with economic globalization like increase in income inequality (Wade, 2002) and pollution (Grossman & Krueger, 1993). Further, we analyze the effect of economic globalization on the malnutrition rate amongst children of Asian countries. This may show whether higher per capita income results in expenditure on nutritious food and supplements whose effect would be important for children's current as well as future health.

We answer the above questions analyzing the experience of Asian countries. Asia has been quite an enigma in terms of technological advancement and human development. Many of the Asian countries- mainly in the South Asia- have developed nuclear capabilities but are ranked amongst the worst in child health, even below the sub Saharan African countries in some cases. Except the southeast Asian countries and China, other countries have not been able to reduce their child mortality rates (Bhutta, 2000). In this complex context, all countries are embracing more open economy and changes brought by globalization. The middle eastern

countries dependent largely on the crude oil trade, globalized tiger economies of the southeast Asia and China and low developed countries of the South Asia make the continent an interesting regional sample to study the above questions.

For deciphering the impact of economic globalization, we have used fixed effect panel data model utilizing 17 years (1995-2011) of data of child mortality in Asian countries. For question about impact of trade on nutritional status, we have used prevalence of underweight in children under the age of five, and did a panel data analysis with data for four time points (1995, 2000, 2005 and 2011).

Broad results of the study show a positive influence of the economic globalization on the child health and nutrition. However, when initial level of development and income is controlled, low income and less developed countries do not seem to match the rate at which high income or industrial countries have been able to reduce child mortality with globalization. We also found that along with economic globalization, political globalization too plays an important role in reducing child mortality rates for Asian countries. Further to these evidences, trade in services shows more positive impact than trade in goods.

Structure of the rest of the paper is as follows: Section 2 reviews the existing relevant literature on this subject and draws a contextual map for this empirical exercise. Section 3 presents the research design and methodology describing the panel data model used for the analysis. Section 4 describes the results and section 5 provides summary of findings and concluding remarks.

2. Literature Review

There are two distinct strands of literature: first, impact of globalization and international trade on economic growth and second, impact of higher income on health outcomes for child.

There is ample evidence present for the first part. The higher a country globalizes, the higher her economic growth (Sachs & Warner, 1995; Srinivasan & Bhagwati, 1999; Dreher, 2006). International trade also makes a positive impact on the national income of an economy (Frankel & Romer, 1999), though there are concerns raised about the distribution of these benefits within the country (Wade, 2002). There have been attempts made to counter the concerns about likely rise in inequality due to globalization and trade. Babones and Vonada

(2009) argued that the rise in inequality could be ascribed to domestic economic policies and not to the globalization process per se.

The second strand of literature is about how higher income impacts the child health. Hitiris and Posnett (1992) found gross domestic product (GDP) as an important determinant of the health spending and income elasticity of it is near unity. Infant mortality and life expectancy as important measures of health for a country were found to be improving with the higher national income (Pritchett & Summers, 1996). Newhouse (1977) found that for 1970's, differences in per capita GDP explained majority of the intercountry variation in expenditure made for healthcare per person. Haddad et al. (2002) found that with higher per capita GDP, malnutrition rate reduces, and its intensity is higher in the nutrition deficient income group (Pinstrup-Andersen & Caicedo, 1978). This stems from the fact that higher disposable income in hands of the poor results in expenditure on nutritious food leading to better nutrition.

Levine and Rothman (2006) have made an attempt to check how trade affects child health. They found that trade does not harm, but on the whole benefits child health through higher GDP growth. Our study deviates from the paper by Levine and Rothman (2006) in two areas: inclusion of globalization as a process and not solely focussing on the trade; and controlling the process with initial levels of development and income. It would result in fine-tuning of the understanding of the impact of economic globalization on child health.

Mainly globalization may impact the child health through two pathways: direct and indirect. Direct pathway works through the improvement in health system and healthcare delivery due to interaction with the developed world. Indirect pathway works through the trickling down mechanism set in motion by increasing overall income.

2.1 Direct pathway: Effect of economic globalization on child health

Economic globalization brings international trade in health consumables like pharmaceuticals, nutritional supplements and medical equipments, knowledge transfer from the developed to the underdeveloped world, movement of medical professionals and quality improvement in healthcare delivery. All these put together may result in betterment of the child health.

Technology revolution has made addressing the health issues of those who are not physically reachable easier and telemedicine has started showing positive results for the healthcare (WHO, 2010). Since the adoption of the General Agreement on Trade in Services (GATS), there has been a structural shift in the health sector. Due to increasing opportunities of medical tourism, private sector finds an incentive to invest in healthcare services which has resulted in the state of the art facilities in developing countries. This has brought high quality advanced treatment to underdeveloped and developing countries though it is out of reach of the poor strata in most of cases. Moreover, it has resulted in switching over of health professionals from the public health system to the private sector deteriorating further the service delivery in the former (Hazarika, 2010).

Trans border movement of health professionals may bring new knowledge to developing countries ultimately benefitting their populations if the natives who moved to the developed world return to their countries in due course. But majority of these professional do not return to their native countries resulting in the brain-drain on the limited supply of health professionals for the developing countries (Bundred & Levitt, 2000).

There is a controversy related to the impact of trade in pharmaceutical drugs due to patent protection. It is clearly recognized that trade related intellectual property rights (TRIPS) agreement had direct bearing on the availability of medicines to the poor as the protection would tend to increase their prices (Commission on IPR, UK, 2002). Although it is believed that for the private sector investment in research and development, protection is required, Mathur (2007) pointed out that IPRs had not encouraged research for drugs curing diseases specifically prevalent in the underdeveloped world.

2.2 Indirect pathway: Effect of economic globalization on child health

In addition to the direct impact on health sector of a country, economic globalization has effects on the health status through higher income, higher public and private health expenditure and increased ability to spend on nutrition and food.

Accelerated economic growth culminates in more income in hands of individuals (Pritchett & Summers, 1996). However, analyzing the health status measured by life expectancy and, infant and child mortality, Pritchett & Summers (1996) found that the impact of higher income on the health status was overestimated by economists. Most of the positives

for health emanating from the trade and globalization have trickled down through income increases.

Environmental degradation associated with trade may hamper the positive impact on the health. Antweiler et al. (2001) found that impact of trade on the environment was minor, but statistically significant. The environmental Kuznets curve supports the argument that until a certain minimum level of GDP, a country may experience environmental degradation with increasing GDP (Grossman & Krueger, 1993). Frankel and Rose (2005) and Lovely and Popp (2008) have argued the opposite case. According to them, trade may result in betterment of the environment because developing countries would adopt the environmental regulation at an early stage in their development experience compared to the industrialized world.

There have been attempt made to check the effect of trade on health by Owen and Wu (2007) and Umaña-Peña et al. (2014). Owen and Wu (2007) found slight positive impact of trade on infant mortality and life expectancy. The second study has found some positive impact on health by liberalization in trade in services.

Thus, our review of literature points to sharp differences of opinion and evidence on the impact of economic globalization on the child health for Asian countries. We need to empirically address the following specific questions for the Asian countries with a more comprehensive framework.

(a) Does globalization have any impact on the child health status?

(b) Does the international trade have any impact on the child health status?

(c) Does the international trade in services and in goods have similar effect on the child health status?

(d) Do globalization and international trade impact the child health status of countries with different level of initial income or development differently?

3. Research Design and Methodology

As stated above, the primary motive of the present study is to check if economic globalization has impacted child health across the Asian countries, and whether it has different impact for countries with different initial levels of income and development. For this, it is imperative to take into consideration all the Asian countries over a given time period

provided their relevant data is available. An attempt is made to ensure inclusion of maximum number of countries in the study for the period from 1995 to 2011. Choice of time period is driven by adoption of GATS in 1995 and data availability issues after 2011.

3.1 Basic Model

Child health status = f (Globalization indicator/s, Control variables)

It converts into a regression equation in matrix form as:

$$h_i = X_i \beta + \alpha_i I_T + \epsilon_i \quad (1)$$

In equation (1), h_i and ϵ_i are $T \times 1$ vectors and α_i is a $N \times 1$ vector, where T and N are number of years and countries under study respectively. X_i is a $T \times K$ vector and i denotes each country. I_T is a T -dimensional column vector of ones. Here, h is child health indicator, X is globalization indicator/s and control variable matrix, α_i is country specific time fixed effects and ϵ_i is an idiosyncratic error terms.

This is for one country i . The single equation including all countries,

$$H = X\beta + D\alpha + \epsilon \quad (2)$$

Here, D is a $NT \times N$ matrix where N diagonal identity matrix are stacked up. α is country specific unobserved effect which is non varying across time- fixed effects. H is matrix of dependent variables- child mortality rates and under nutrition measured by percentage of underweight children under five years of age.

3.2 Variables and Data

The main source of the data is The World Bank data repository. We obtained annual data from year 1995 to year 2011 on infant mortality rate (IMR) and under five mortality rate (U5M) from this database. Malnutrition rate, measured as fraction of underweight children below five years of age, is obtained from the Global Hunger Index statistics published by the International Food Policy Research Institute. This data is not available annually, but for five year slots only. Hence we have assumed that it represented the middle year of the time period. e.g. If data is for the time period 1993 to 1997, we have taken it as the data point for 1995. These are the dependent variables for the current study. Table 1 presents the details on these variables.

The main explanatory variables used are the globalization index and its components and a few ratios such as trade to GDP ratio, trade-in-services to GDP ratio, and trade-in-goods to GDP ratio.

For this study, we have used KOF Globalization Index (Dreher, 2006) as an independent variable measuring globalization. We prefer this due to its easy to understand decomposition in three components- economic, social and political dimensions- and availability of more number of countries for longer time period compared to the other indices like Maastricht Globalization Index (Figge & Martens, 2014), CSGR Globalization index (Caselli, 2006) and A.T. Kearney/ Foreign Policy Magazine Globalization Index (Martens & Zywiets, 2006).

Table 1: Child Health Indicators Considered In The Study

	No. of countries	Year	Mean	Median	Standard Deviation	Maximum value	Minimum Value
IMR (per 1000 live births)	41	1995	41.45	34.90	28.89	97.2 (Pakistan)	4.1 (Singapore)
		2000	34.59	29.35	24.80	87.9 (Pakistan)	3.1 (Singapore)
		2005	27.79	21.80	20.15	80.1 (Pakistan)	2.3 (Singapore)
		2011	21.55	16.35	16.30	72.1 (Pakistan)	2.2 (Singapore)
U5M (per 1000 live births)	41	1995	54.05	44.55	40.45	139.6 (Lao PDR)	5.2 (Singapore)
		2000	44.18	35.40	33.78	117.4 (Lao PDR)	4 (Singapore)
		2005	34.61	25.80	26.47	101.4 (Pakistan)	2.9 (Singapore)
		2011	26.25	18.95	20.72	89.9 (Pakistan)	2.8 (Singapore)
Malnutrition Rate (% of children below five years of age)	35	1993-1997 (1995)	18.99	12.90	14.72	55.2 (Bangladesh)	2.6 (Russia)
		1998-2002 (2000)	16.36	11.30	14.34	46.3 (India)	0.8 (Qatar)
		2003-2007 (2005)	13.98	8.35	13.08	43.5 (India)	0.6 (Qatar)
		2008-2013 (2011)	12.13	8.50	11.15	36.8 (Bangladesh)	0.3 (Qatar)

International trade captures a large part of economic globalization a country experiences. Trade to GDP ratio is one of the ways to denote how much a country is open to international trade (Antweiler et al.,2001; Davies & Quinlivan, 2005; Frankel & Rose, 2005;

Owen & Wu, 2007). It is also known as trade intensity (David, 2007). Here trade includes both exports and imports. It reflects how much a country is integrated with the world economy.

Trade in services to GDP and trade in goods to GDP ratio are the two components of trade to GDP ratio. Hence, we have used them separately as well as together for analysing their impact on child health indicators. Through the restricted least squares method, it is possible to test the hypothesis whether they have the same or different impact on child health indicators.

Apart from the above stated main explanatory variables, we have used certain control variables which may have impact on health. Following are the control variables used: per capita gross domestic product at 2005 constant prices, per capita health expenditure at 2005 constant prices, education index from Human Development reports, per capita carbon dioxide emissions in metric tons, percentage of population having access to sanitation facilities and improved drinking water, out of pocket health expenditure as a percentage of total health expenditure.

In order to test the hypothesis about the differential impact of the trade and globalization on child health for countries with different development or income status, the base year (1995) income and development status have been used. This data has been obtained from Human Development Report, 1995. Out of 41 Asian countries under study, countries with "high", "medium" and "low" human development status are respectively 12, 20 and 9. Number of countries with income status of "high", "middle" and "low" are respectively 7, 19 and 15. The report also classified countries based on their industrial development status into three categories: "industrial", "developing" and "low developing". No. of countries falling into these categories are respectively 10, 24 and 7.

Table 2 gives details about the notations used for various variables and their operationalization in the model. Since it requires more effort to reduce child mortality rates from 5 to 4 compared to bringing it down from 13 to 12, we have operationalized most of the variables by taking their natural logarithmic form. This also allows interpretation of their estimated coefficients in the elasticity terms.

3.3 Panel Data Model Estimation

For our analysis, the model in equation (2) has been used. The explanatory variables are changed as per the research questions at hand.

We use Hausman test (Hausman, 1978) to check whether fixed effects model or random effects model is appropriate. The test showed in all cases the fixed effects model is appropriate. The data is further put to test to check the assumptions made about the error term structure. To check for heteroskedasticity, autocorrelation and cross-sectional dependence, respectively Modified Wald test (Baltagi et al.,2006), Woolridge's test (Woolridge, 2002) and Pesaran test (Pesaran, 2004) are used.

Table 2: Variables, their operationalization and notation

Type of variable	Variable	How is it used in regression model: Level/Log (Natural log)?	Notation used in results
Dependent Variables	Infant mortality rate (IMR)	log	lnimr
	Under five mortality rate (U5M)	log	lnu5m
	Malnutrition Rate	level	undernutrition
Explanatory Variables	Globalization index (GI)	log	lngi
	Economic (EG), Social (SG), Political (PG) globalization indices	log	lneg, lnpg, lnsg
	Trade to GDP Ratio	Level (percentage)	trade
	Trade-in-Goods to GDP & Trade-in-Services to GDP ratios	Level (percentage)	goods, services
	Low human development country dummy and trade to GDP ratio interaction term	Level	hdltr
	Medium human development country dummy and trade to GDP ratio interaction term	Level	hdmtr
	Low income country dummy and trade to GDP ratio interaction term	Level	ltr
	Middle country dummy and trade to GDP ratio interaction term	Level	mtr
	Low development country dummy and trade to GDP ratio interaction term	Level	ldctr
	Developing country dummy and trade to GDP ratio interaction term	Level	dctr
Control Variables	GDP per capita (2005 constant prices)	log	lngdp
	Health expenditure per capita (Private+Public) (2005 constant prices)	log	lnhe
	Carbon Dioxide emission per capita (Metric tons)	log	lnco2
	Out of pocket health expenditure to total health expenditure	Level (percentage)	oop

	Access to sanitation facilities (percentage of population)	Level (percentage)	sanitation
	Access to improve drinking water (percentage of population)	Level (percentage)	drinkwater
	Education index (EI)	log	inei

These tests suggested that these issues for panel data under study need to be corrected for before using fixed effects model. To handle these complexities, Driscoll and Kraay estimation method (Driscoll & Kraay, 1998; Hoechle, 2007) has been used for data analysis.

The model having trade in services and trade in goods to GDP ratios as explanatory variables may be taken as unrestricted model. Whereas, the model with trade to GDP ratio is restricted model. And then it is checked whether impact of trade in services and trade in goods is different from composite trade. For checking whether or not initial level of income or development status has any effect on how trade impacts child health, slope dummy is used which is interacted with the explanatory variable. This exercise would answer if there is any difference between low income/development and high income/development countries' experiences in garnering benefits of trade for their child health status.

For ensuring that the results found with above said method is robust and reliable, same models are also analyzed with Prais Winsten estimation method (Prais & Winsten, 1954; Beck & Katz, 1995). To further strengthen the results reliability, analysis is done using one year lagged explanatory variables also.

4. Results

4.1 Globalization and Child Health Status

Table 3 shows the results for impact of the globalization on the child health indicators. First three columns are for analysis using composite globalization index as the main explanatory variable and last two columns are presenting results for the model where the three dimensions of globalization are used separately as main explanatory variable. It is evident that with increase in the globalization index, IMR, U5M and Malnutrition rate are reducing which means that the higher the globalization, the better the child health status of Asian countries. Moreover, per capita GDP and health expenditure, education level and access to sanitation facility and improved drinking water have positive impact on the child health. Similarly, per capita carbon dioxide emissions, used as a proxy for pollution in this

study, has the expected negative impact on the child health. The negative and statistically significant coefficient on globalization index for malnutrition rate is a huge positive for the Asian countries as South Asia along with Sub Saharan Africa is deemed to be the worst region for child malnutrition.

When the three dimensions of globalization are separately used as explanatory variables, economic and political globalization seem to be the main force behind the positive impact of the globalization on the child mortality rates. Social dimension of the globalization is not playing an important role. Economic globalization includes benefits drawn from international trade, portfolio investments and foreign direct investments flowing into a country. Political globalization is turning out to be important as more participation and cooperation at global policy level and engagement with other countries politically may result

Table 3: Impact of the globalization on the child health status

	Dependent variables - Child health indicators				
	lnimr	lnu5m	undernutrition	lnimr	lnu5m
lngi	-0.971*** (0.119)	-0.973*** (0.117)	-7.938** (3.737)		
lneg				-0.325*** (0.0507)	-0.319*** (0.0526)
lnsg				0.0254 (0.0175)	0.0311 (0.0236)
lnpg				-0.420*** (0.0471)	-0.435*** (0.0482)
lngdp	-0.255*** (0.0350)	-0.273*** (0.0363)	-0.425 (1.775)	-0.317*** (0.0217)	-0.330*** (0.0239)
lnhe	-0.0091 (0.0150)	-0.0006 (0.0146)	0.316 (0.531)	0.0327 (0.0216)	0.0470 (0.0317)
lnei	-0.838*** (0.0612)	-0.902*** (0.0584)		-1.004*** (0.111)	-1.023*** (0.100)
lnco2	0.0764** (0.0310)	0.0802** (0.0328)		0.0875*** (0.0290)	0.0909*** (0.0289)
sanitation	-0.0038 (0.001)	-0.0025 (0.0009)		-0.0005 (0.0009)	-0.0029*** (0.0009)
oop	0.0046*** (0.0007)	0.0041*** (0.0007)	0.00428 (0.0422)	0.0051*** (0.0006)	0.0047*** (0.0006)
drinkwater	-0.0014 (0.0009)	-0.0003 (0.0011)	-0.382*** (0.0779)	0.0038*** (0.001)	0.0015 (0.0011)
_cons	7.660*** (0.414)	8.230*** (0.400)	79.78*** (9.460)	7.009*** (0.347)	7.673*** (0.336)
No. of countries	41	41	35	41	41

Note: Driscoll and Kraay standard errors in the bracket. *** p < 0.01, ** p < 0.05, * p < 0.1

in more development aid, investments and technology transfer. Even engagement with multilateral agencies such as the World Bank, IMF, ADB, WHO and UNICEF appears to be beneficial for the countries.

4.2 International Trade and Child Health Status

Table 4 presents the impact of the international trade on the child health status. In first three columns trade to GDP ratio is used as explanatory variable, whereas in column four and five, trade in services to GDP and trade in goods to GDP ratios are separately used as explanatory variables.

Table 4: Impact of international trade on the child health status

	Dependent variables - Child health indicators				
	lnimr	lnu5m	undernutrition	lnimr	lnu5m
trade	-0.0005 (0.0003)	-0.0005 (0.0003)	-0.0319* (0.0147)		
services				-0.0069*** (0.0007)	-0.0072*** (0.0008)
goods				0.0006 (0.0004)	0.0006 (0.0005)
lngdp	-0.565*** (0.0281)	-0.586*** (0.0290)	-3.244** (1.060)	-0.556*** (0.0314)	-0.575*** (0.0326)
lnhe	-0.0378*** (0.0121)	-0.0460*** (0.0120)	0.545 (0.487)	-0.0427** (0.0157)	-0.0513*** (0.0159)
lnel	-1.047*** (0.0735)	-1.115*** (0.0714)		-1.065*** (0.0684)	-1.134*** (0.0664)
lnco2	0.0703*** (0.0232)	0.0761*** (0.0257)		0.0170 (0.0195)	0.0186 (0.0224)
sanitation	-0.0041** (0.0016)	-0.0029* (0.0016)		-0.0003 (0.0019)	-0.0012 (0.0018)
oop	0.005*** (0.001)	0.0044*** (0.001)	0.0069 (0.0422)	0.0053*** (0.001)	0.0048*** (0.001)
impdriwat	-0.0029 (0.0009)	-0.0046*** (0.001)	-0.396*** (0.0679)	-0.0026*** (0.0009)	-0.0016* (0.0009)
_cons	6.342*** (0.113)	6.909*** (0.121)	74.22*** (7.529)	6.119*** (0.0983)	6.659*** (0.101)
No. of countries	41	41	35	41	41

Note: Driscoll and Kraay standard errors in the bracket. *** p < 0.01, ** p < 0.05, * p < 0.1

The table shows that international trade does not have statistically significant impact on the child health indicators, although its direction is negative. The control variables impact the child health in expected manner. Result from the last two columns show an interesting scenario. While total trade to GDP ratio has no significant effect on the child mortality rates, trade in services seems to have statistically significant negative effect on these rates. Trade in goods to GDP ratio, however, is statistically significant.

Since trade in services to GDP and trade in goods to GDP ratio add up to trade to GDP ratio, restricted least squares regression is used to test whether or not the coefficients of trade in services to GDP ratio and trade in goods to GDP ratio are statistically the same as that of the trade to GDP ratio. In this analysis¹, it turns out that for child mortality rates, impact of trade in services is different from that of the trade in goods. Further, it has been found that impact of trade in services to GDP ratio is higher compared to that of trade in goods to GDP ratio. This result is very important for policymakers of Asian countries. They have higher incentive to liberalize trade in services as it leads to higher positive benefit for child health and may be overall health. This result sharply differs from the one obtained by Umaña-Peña et al. (2014).

4.3 Impact of Trade: Countries with Different Development and Income Status

Table 5 shows the results for analysis about whether international trade impact child mortality rates differently for countries with different initial development or income status. First two columns show result for comparison of the impact across three categories of countries as per human development based classification. The base case for the analysis is high human development countries. In similar way, next two and last two columns show comparison between groups of countries classified as per industrial development status and income status respectively. For these base groups are industrial countries and high income countries respectively.

1 Restricted least squares method:

Unrestricted model: Health indicator is regressed on trade in services to GDP and trade in goods to GDP ratio

Restricted model: Health indicator is regressed on the trade to GDP ratio

$$H_0 : \beta = \beta_1 = \beta_2$$

H_a : Null hypothesis is not true.

Here β = coefficient of trade to GDP ratio from Table 4

β_1 = coefficient of trade in services to GDP ratio from Table 4

β_2 = coefficient of trade in goods to GDP ratio from Table 4

F-statistic obtained for IMR and U5M are 3.476 and 5.56 respectively. These means that at 95% confidence level, H_0 is rejected.

For, IMR and U5M, to check whether coefficient of trade in services is lower than that of trade in goods, t tests are done.

For IMR and U5M, t-statistic are 1.896 and 1.896 at 95% confidence level.

This means that at 95% confidence level, β_1 is lower than β_2 for child mortality rates.

Table 5. Impact of trade on child mortality for countries with different initial development status

	Dependent variables - Child health indicators					
	Human Development Status		Industrial Development Status		Income Status	
	lnimr	lnu5m	lnimr	lnu5m	lnimr	lnu5m
hdltr	0.0063*** (0.0009)	0.0059*** (0.0009)				
hdmtr	0.0008*** (0.0003)	0.0008** (0.0003)				
ldctr			0.0048*** (0.0012)	0.0043*** (0.0013)		
dctr			-0.0003 (0.0006)	-0.0004 (0.0006)		
ltr					0.0057*** (0.0009)	0.0057*** (0.0009)
mtr					0.0019* (0.001)	0.0019* (0.001)
trade	-0.0015** (0.0004)	-0.0014*** (0.0004)	-0.0007*** (0.0002)	-0.0006*** (0.0002)	-0.0035*** (0.0005)	-0.0034*** (0.0005)
lngdp	-0.554*** (0.0343)	-0.576*** (0.0348)	-0.551*** (0.0323)	-0.574*** (0.0327)	-0.535*** (0.0441)	-0.556*** (0.0447)
lnhe	-0.0410** (0.0112)	-0.0490*** (0.0113)	-0.0408*** (0.0123)	-0.0487*** (0.0123)	-0.0312** (0.0119)	-0.0392*** (0.0115)
lnei	-1.120*** (0.0734)	-1.182*** (0.0732)	-1.108*** (0.0797)	-1.170*** (0.0790)	-1.029*** (0.0659)	-1.098*** (0.0639)
lnco2	0.0682*** (0.0234)	0.0737** (0.0267)	0.0762*** (0.0235)	0.0812*** (0.0257)	0.0155 (0.0173)	0.0220 (0.0214)
sanitation	-0.0057*** (0.0019)	-0.0045** (0.0019)	-0.0054** (0.0019)	-0.0041** (0.0019)	-0.0034* (0.0018)	-0.0022 (0.0018)
oop	0.0043*** (0.0011)	0.0038*** (0.0011)	0.0044*** (0.0011)	0.0039*** (0.0011)	0.0043*** (0.0011)	0.0038*** (0.0011)
impdriwat	-0.0067*** (0.0018)	-0.0081*** (0.0019)	-0.00591*** (0.0018)	-0.0073*** (0.0019)	-0.0039** (0.0018)	-0.0056** (0.0019)
_cons	6.445*** (0.146)	7.007*** (0.149)	6.376*** (0.130)	6.942*** (0.138)	6.447*** (0.164)	7.012*** (0.172)
No. of countries	41	41	41	41	41	41

Note: Driscoll and Kraay standard errors in the bracket. *** p < 0.01, ** p < 0.05, * p < 0.1

The results demonstrate that low human development countries are not able to garner the benefits from trade so well as high human development countries or mid human development countries. Moreover, if we sum the coefficients of trade to GDP ratio and interaction term for low human development countries, it becomes positive implying increasing child mortality rates with higher trade. This may be due to the lack of proper systems and processes that lead to higher inequality resulting from a large proportion of the population not benefitting from the trade. Our result supports arguments of Cornia (2001). Although medium human development countries are also not doing so good as high human development countries, their child mortality rates are falling with higher trade. Their institutional mechanisms are yet not fully developed to garner the optimal gains from the trade.

Similar pattern of results are found with industrial development based groups and income status based groups. The countries falling in lower most group are not able to garner benefits emanating from trade and their child mortality rates are increasing. Whereas countries falling in high income group and industrial countries group garner the highest benefits of trade in terms of child health. Middle group countries show a positive impact of trade on child mortality rates but not to the same extent as higher income countries or industrially developed countries. Our exercise of considering groups of countries based on income or development levels establishes that international trade has impact on a country's child health status, though its direction and magnitude varies depending on the level of income or development. As a result, when all countries are considered without separating such groupings of the countries, the average impact of international trade on child health turns out statistically insignificant, because diametrically opposite impact in different groups of countries cancel out.

5. Concluding Remarks

The globalization and international trade do have an impact on the child health status of Asian countries though it is not uniform across different categories of countries, because there are inherent differences in their ability to garner benefits of globalization as suggested by Stiglitz (2002).

Our result showing that low income countries or low human development countries or low industrial development countries are not benefitting in terms of their child health status

from the international trade supports the arguments about increasing income as well as health inequality in those countries (Ouattara, 1997; Cornia, 2001). This result, however, need not deter those countries to indulge in trade and integrating with the global economy because as they move up the development ladder, they would increasingly gain from globalization as our other results indicate. They should focus more on the domestic policies and mechanisms to ensure that benefits are distributed more equally. Similar experiences have been documented for Latin America and Tiger economies of South East Asia (Perry & Olarreaga, 2006).

As far as various dimensions of globalization are concerned, we find that economic and political integration are more important than the social integration. It also points to the importance of international trade, though foreign direct investments, portfolio investments and remittances from foreign countries not considered explicitly in the current study are also relevant. Political integration revealed by bilateral relationships and engagement in policy making at multilateral organizations to bring development aid and professional support for child health in Asia also plays a significant role.

Strategic importance of the trade in services needs to be appreciated and explored further as it seems to be bringing more benefits than the trade in goods. It could be a result of human capital requirement related to services sector. Trade in goods from Asia, mainly from poor countries like Bangladesh and Myanmar, are from labour intensive industries established by multinational companies to take advantage of lax work environment and low wages. Since they have not ratified the fundamental ILO (International Labour Organization) conventions with strict implementation on the ground (European Parliament, 2014), they may not gain sufficiently from the trade in goods for child health.

Our study clearly shows that globalization and international trade do provide an opportunity for the Asian countries to improve the child health and overall development of the region. These global processes, however, on their own are not likely to result in substantial improvements without simultaneous reforms in the domestic policies and institutions essential to garner the benefits to climb the ladder of development.

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