



# *Health, Trade Openness and Economic Growth in ASEAN*

*Nadeem Ahmed, MS Scholar*

*Agha Jahanzeb, Assistant Professor*

*Sukkur IBA University*

# Introduction

- Macroeconomic policies and preferences
  - Macroeconomic objectives
  - Economic performance
- Aggregate production of the economy is the product of factors of production
  - Role of human capital is imperative in production process and achieving growth
- Human capital concept in economics
  - Education, training, health and other investment
- Performance of economy
  - Degree of international trade, financial development, investment and FDI
- Earlier work on health expenditure while we focus health outcome
  - Association of Southeast Asian Nations (ASEAN).

## Introduction (Cont.)

### ASEAN progress

- Extraordinary economic and social progress since foundation in 1967
- Average per capita GDP: US\$4,021 in 2016, US\$122 in 1967
- Improvement in nutrition and health helps to longer life expectancy
  - A newborn today on average will live 15 years longer than a baby born in 1967
- Represents almost 7% of total global trade
- 4th largest trade powerhouse of the world
  - after European Union, USA and China.
- We argue that health outcomes and degree of international trade affect the economic growth
- This study aims to examine this relationship

# Literature

- Romer (1990) and Barro (1991) highlight the significance of human capital in the economy
- About one third of Britain economic growth is the result of health improvements between 1790 and 1980 (Fogel, 1994)
- Many empirical studies confirm the health-led growth model in
  - Pakistan (Akram *et al.*, 2008; Ali *et al.*, 2012)
  - Nigeria (Oladele and Adeniji, 2015)
  - Turkey (Atilgan *et al.*, 2017)
  - Ghana (Boachie, 2017)
- Earlier work on health inputs
- Many studies, theoretically and empirically, highlight the role of trade openness in growth
  - (Barro, 1999; Beck, 2002; Akam *et al.*, 2008; Menyah *et al.*, 2014; Boachie, 2017)
- Economies are also being affected by level of investment, FDI and inflation

# Data and variables

- Annual data from 1993 to 2015 for seven ASEAN countries
  - Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.
  - (Brunei, Laos, Myanmar)

<i>Variable</i>	<i>Measure</i>	<i>Proxy</i>	<i>Source</i>
GDP	Economic Growth	GDP per capita constant 2010 US\$	WDI
HLT	Health	Life expectancy at birth, total in years	WDI
TRD	Trade Openness	Trade (Import + export in goods and services) % GDP	WDI
INV	Investment	Gross fixed capital formation % GDP	WDI
FDI	Foreign Direct Investment	FDI, net inflows % GDP	WDI
CPI	Inflation	Consumer price index (2010 = 100)	WDI

## Econometric tests and model

- Autoregressive-Distributed Lag approach (ARDL)
- Koa and Fisher cointegration tests
- Granger causality test
- LLC and IPS panel unit root tests

$$GDP_{it} = \alpha_0 + \beta_1 HLT_{it} + \beta_2 TRD_{it} + \beta_3 INV_{it} + \beta_4 FDI_{it} + \beta_5 CPI_{it} + \varepsilon_{it}$$

# Results

Table 1: Descriptive statistics

	<b>GDP</b>	<b>HLT</b>	<b>TRD</b>	<b>INV</b>	<b>FDI</b>	<b>CPI</b>
Mean	8129.042	70.698	147.960	25.180	5.579	79.880
Median	2519.510	71.412	120.735	24.267	3.508	82.666
Maximum	52244.590	82.595	441.604	43.586	26.521	144.906
Minimum	316.102	54.442	41.874	10.691	-2.590	16.328
Std. Dev.	13070.560	5.815	99.138	6.597	5.723	26.588
Skewness	2.149	-0.443	1.429	0.675	1.773	-0.112
Kurtosis	6.296	3.487	4.081	3.448	5.859	2.605
Observations	161	161	161	161	161	161

## Results (Cont.)

Table 2: Correlation matrix

	<b>LGDP</b>	<b>LHLT</b>	<b>LTRD</b>	<b>LINV</b>	<b>LFDI</b>	<b>LCPI</b>
<b>LGDP</b>	1.000					
<b>LHLT</b>	0.776	1.000				
<b>LTRD</b>	0.694	0.701	1.000			
<b>LINV</b>	0.476	0.633	0.295	1.000		
<b>LFDI</b>	0.366	0.440	0.672	0.176	1.000	
<b>LCPI</b>	0.409	0.473	0.402	0.095	0.273	1.000



## Results (Cont.)

Table 3: Panel unit root tests

Variable	LLC		IPS	
	Intercept	Intercept and trend	Intercept	Intercept and trend
LGDP	0.069	-1.333*	4.563	-1.061
ΔLGDP	-5.522***	-5.196***	-5.543***	-4.712***
LHLT	-4.800***	-19.480***	-0.246	-11.667***
ΔLHLT	-10.996***	-12.367***	-8.005***	-8.331***
LTRD	-3.500***	-3.301***	-1.350*	-2.786***
ΔLTRD	-8.233***	-8.141***	-8.154***	-8.473***
LINV	-2.526***	-3.359***	-2.871***	-2.127**
ΔLINV	-8.513***	-7.344***	-7.066***	-5.641***
LFDI	-3.595***	-2.935***	-4.464***	-3.175***
ΔLFDI	-10.779***	-9.479***	-11.212***	-10.102***
LCPI	-6.036***	-1.565*	-2.720***	-1.777**
ΔLCPI	-6.986***	-6.757***	-5.115***	-4.921***

## Results (Cont.)

Table 4: Koa and Fisher Cointegration tests

		t-Statistic
<b>Kao</b>	ADF	-2.922***
<b>Hypothesized No. of CE(s)</b>	<b>Trace value</b>	<b>Max-Eigen value</b>
None	381.6***	171.2***
At most 1	238.5***	130.3***
At most 2	140.9***	75.8***
At most 3	77.7***	40.8***
At most 4	52.6***	41.3***
At most 5	36.8***	36.8***

## Results (Cont.)

Table 5: Long-run ARDL results for Panel (Dependent variable: LGDP)

Regressor	Coefficient	Standard Error	t-ratio
LHLT	3.913***	0.660	5.928
LTRD	0.427***	0.109	3.916
LINV	-0.058	0.058	-0.991
LFDI	0.025	0.026	0.967
LCPI	0.680***	0.088	7.724

## Results (Cont.)

Table 6: Short-run ARDL results for cross-sections and Panel (Dependent variable:  $\Delta LGDP$ )

-	$\Delta LHLT$	$\Delta LTRD$	$\Delta LINV$	$\Delta LFDI$	$\Delta LCPI$	C	ECM t-1
<b>Cambodia</b>	15.116	0.146***	-0.005**	0.060***	0.003	-2.082***	-0.141***
<b>Indonesia</b>	98.727	-0.044***	-0.090***	0.012***	-0.519***	-1.618***	-0.117***
<b>Malaysia</b>	-32.482	-0.131***	0.165***	0.103***	-0.138	-0.060	-0.006
<b>Philippines</b>	355.127	-0.059***	0.066***	-0.020***	-0.397***	-5.519	-0.393***
<b>Singapore</b>	-6.317	-0.166***	-0.063**	0.024***	-0.005	-11.343	-0.948***
<b>Thailand</b>	30.219	-0.220***	0.368***	0.021***	0.448**	-1.562	-0.119***
<b>Vietnam</b>	155.245	0.117***	-0.007***	-0.011***	-0.115***	1.788*	0.116***
<b>Panel</b>	87.948*	-0.051	0.062	0.027*	-0.103*	-2.914	-0.230*

## Results (Cont.)

Table 7: Cross-sectional Fully Modified Least Squares (FMOLS) (Dependent Variable: LGDP)

	LHLT	LTRD	LINV	LFDI	LCPI	C
<b>Cambodia</b>	5.168***	-0.165	0.096	0.017	-0.006	-14.474***
<b>Indonesia</b>	18.289***	-0.114***	0.194***	0.008	-0.326***	-67.880***
<b>Malaysia</b>	4.128	0.148	0.175**	0.051*	0.998**	-14.66
<b>Philippines</b>	16.501**	-0.248***	0.488***	-0.001	-0.154	-61.739**
<b>Singapore</b>	3.076***	0.320***	-0.057	0.060***	0.850***	-8.622**
<b>Thailand</b>	3.799**	0.133*	0.248***	-0.001	0.524**	-11.678**
<b>Vietnam</b>	14.546***	0.034	0.056	0.044	0.167*	-56.834***
<b>Panel</b>	9.358***	0.015	0.171***	0.025***	0.293***	N/A

## Results (Cont.)

Table 8: Granger causality test for panel

Direction	F-Statistic
LHLT → LGDP	5.755***
LGDP → LHLT	2.297
LTRD → LGDP	2.899*
LGDP → LTRD	5.019***

→ indicate the direction of causality. Lags (2) are selected based on Schwarz information criterion and Hannan-Quinn information criterion.

## Conclusion

- Panel ARDL results reveal that health and trade have a strong positive impact on economic growth in seven ASEAN countries in long run.
- Health granger causes economic growth and it causes trade
- Health of human capital is a significant factor affecting economic growth in ASEAN countries
- It support the argument that healthier individuals have higher productivity level which increases growth in the economy
- Suggested, policy makers to consider the role of health of human capital along with the trade openness in the growth of economy
- Future research can be done to investigate the factors improving health of human capital