

Philippine Economic Growth: The Significance of TVET[©]

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ABSTRACT

The study revisits the impact of TVET sub-sector to Philippine economic growth. With the enactment of TESDA in 1994, the economy expects to achieve economic growth, poverty reduction and ultimately, development. The multiple regression technique, with GDP growths as the dependent variable and growths in agriculture, industry, services sectors and a dummy variable for TVET and its interactions as quantitative and qualitative regressors, was used. The observation period runs from 1985 to 2012. Results showed that while TVET relates significantly to real GDP growths 99%, its impact is unfelt in the agriculture sector, the largest employing sector of the country. Moreover, although its effect is significant in both the services and industry sectors, the impact is rather low or opposite to expectations. To this effect, despite the presence of TVET, poverty in Philippine society remains a sticky challenge.

KEYWORDS

Education, TVET, Philippine economic growth, industry sector, agriculture sector, service sector, quantitative and qualitative design, Philippines, Asia

INTRODUCTION

The enactment of the Technical Educational and Skill Development Act in 1994 known as the TESDA Act intends to provide relevant, accessible, high quality and

efficient technical education and skills development to Filipino middle-level work force to promote the country's development goals. The education that carries out the skills development is the Technical Vocational Education and Training (TVET) System. However, despite this effort, poverty rates in the Philippines did decline significantly. How relevant is TVET to the country's economic growth? This study tries to unearth the answers.

Has the TVET subsector contributed to the growth of the agriculture, manufacturing and the service sectors of the economy and to the economy as a whole? As the Second Fundamental Theorem on Welfare articulates, the undeniably large and essentially huge indispensable role of government to afford initial endowments, in the form transfers, or trainings and education, free of charge to citizens with less capability to compete ably, expects to take the country to becoming Newly Industrialized Economy (NIE) (Northern Research Review and Advisory Group, 1996). Since implementation, it is just but imperative to evaluate if there has been structural improvements due to TVET. The hypothesis is that TVET, together with the agriculture, industry and service sectors must have been, collectively and individually, able to effect growth against the null that it has not. Moreover, with TVET interactions to these major sectors, these stimulated economic growth significantly against the null that these did not.

METHODOLOGY

Line graphs and structural regression (Gujarati, 2010) with a dummy variable, TVET, is used. The model is as follows:

$$GDP_i = \alpha \pm \beta_1 Agri_i \pm \beta_2 Industry_i \pm \beta_3 Services_i \pm D_1 TVET_i \pm D_2 (Agri * TVET_i) \pm D_3 (Industry * TVET_i) \pm D_4 (Services * TVET_i) \pm \epsilon$$

Where: GDP_i = Growth in GDP for year i ; $Agri_i$ = Growth in agriculture for year i ; $Industry_i$ = Growth in Industry for year i ; $Services_i$ = Growth in Services for year i ; D_i = TVET ; 1 in years 1995-2012, 0, for years, 1985-1994; $D_2 (Agri_i * TVET)$, $D_3 (Industry_i * TVET)$, $D_4 (Services_i * TVET)$ = interaction effect regressors in year i ; i 's = represent the period in consideration 1985-2012; β_s = numerical coefficients that measure their relative impact to GDP growth; D_s = numerical coefficients to measure the relative impact of the dummy variable and its interactions to the major sectors; α = intercept ; ϵ = stochastic error.

Key Indicators of Developing Asian and the Pacific Countries for earlier data set and Key Indicators for Asia and the Pacific for recent set are the sources of the secondary data. The data run is from 1985 to 2012. The study was done from June 2014 to May 2015.

RESULTS AND DISCUSSION

Modeling Philippine Growth

Table 1 presents the GDP growth rates of the Philippines from 1985 to 2012, as well as those of the agriculture, industry and the services sectors. The last column shows the code of TVET subsector on years, 0 prior to TVET implementation and 1 after 1994.

Table 1: Gross Domestic Product, Agriculture, Industry and Services Growth of Output (%), TVET Implementation Philippines, 1985- 2012

Year	GDP	Agriculture	Industry	Services	TVET
1985	-7.3	-1.9	-15.7	-2.1	0
1986	3.4	3.7	2.3	4.2	0
1987	4.3	3.2	4	5.2	0
1988	6.8	3.2	8.8	7.2	0
1989	6.2	3.0	7.4	7	0
1990	3	0.5	2.6	4.9	0
1991	-0.6	1.4	-2.7	0.2	0
1992	0.3	0.4	-0.5	1	0
1993	2.1	2.1	1.7	2.5	0
1994	4.4	2.6	5.8	4.2	0
1995	4.7	0.9	6.7	5.0	1.0
1996	5.9	3.8	6.4	6.4	1.0
1997	5.2	3.1	6.1	5.4	1.0
1998	-0.6	-7.0	-2.7	2.8	1.0
1999	3.1	9.6	-1.5	4.5	1.0
2000	4.4	3.4	6.5	3.3	1.0
2001	2.9	3.4	1.0	4.0	1.0
2002	3.6	3.3	2.9	4.2	1.0
2003	5.0	4.7	4.3	5.5	1.0
2004	6.7	4.3	5.2	8.3	1.0
2005	4.8	2.2	4.2	5.8	1.0
2006	5.2	3.6	4.6	6.0	1.0
2007	6.6	4.7	5.8	7.6	1.0
2008	4.2	3.2	4.8	4.0	1.0
2009	1.1	-0.7	-1.9	3.4	1.0
2010	7.6	-0.2	11.6	7.2	1.0
2011	3.6	2.6	1.8	4.9	1.0
2012	6.8	2.8	6.8	7.6	1.0

Source: (Asian Development Bank, various years)

Overall, growths of the country's Gross Domestic Product (GDP) have never been quite optimistic. The flatter slope of the linear line summarizing the points signifies a rather slow growth rate across time (Figure 1). The movement has not really taken off fully. One cause is poverty and the persistence of poverty causes very slow growth (Gerson, 1998). Similar observations are presented in the works of Norio Usui (2012) and by NEDA (2014) dubbing, the sluggish growth brought by the manufacturing sector as "jobless growth. The data seem to imply the stickiness of the economy to uproot the poor from poverty. Philippines has been unable to close poverty gaps and the country is still poor.

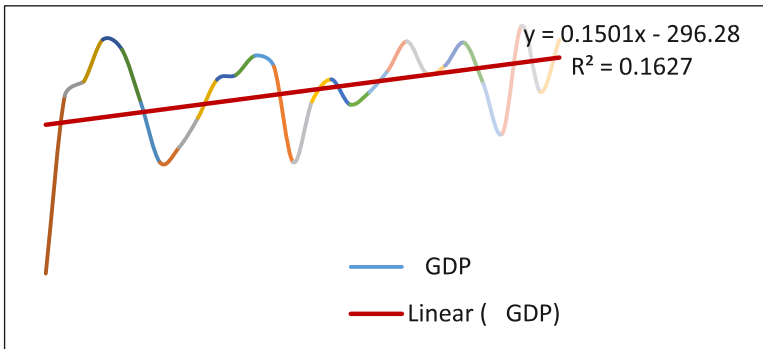


Figure 1. Growth of the Gross Domestic Product (GDP_{real}) Philippines, 1985-2012

The model that explains the contributions of TVET and of other sectors to GDP is given by the equation;

$$\begin{array}{cccccc}
 \text{GDP} = & -0.184 & + 0.151\text{Agri} & + 0.353\text{Industry} & + 0.491\text{Services} & + 0.231\text{TVET} \\
 & (0.51) & (0.000) & (0.000) & (0.000) & (0.003) \\
 & & & F=0.000 & R^2 = 0.998 & [2]
 \end{array}$$

The equation tells that 99.8% of the variation in GDP can be explained by the collective variation of the agriculture, industry, services as well as of the implementation of TVET programs in the country (R2 = 0.998). All sectors played significant contribution to growth. The highest significant impact came from the services sector (0.491) and the least productive player is the agriculture sector (0.151). Such performance supports the graphical presentation shown in Figure 2 where the agriculture line is rather flat, signifying slower growth. The significant F stat suggests statistical robustness of the model and thus is safe to use to estimate economic growth performance of the economy over time.

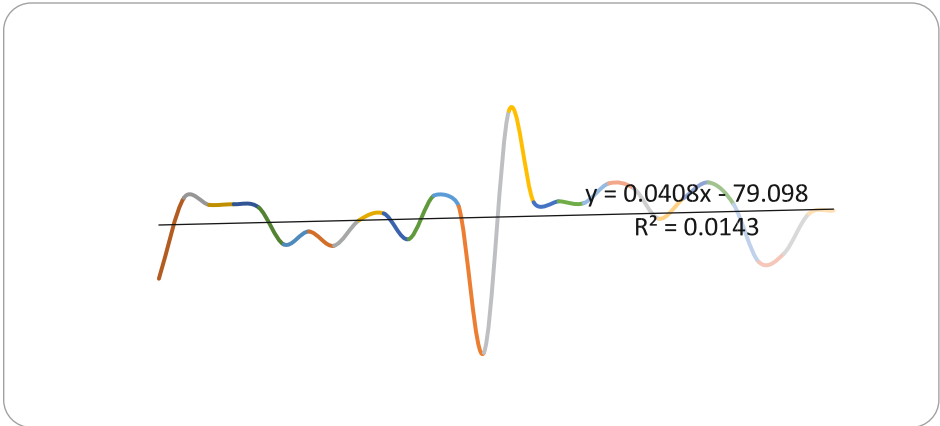


Figure 2. Growth of the Agriculture Sector, Philippines, 1985-2012

TVET's Significance

To find out the impact of TVET to GDP and to the various major sectors, the interaction information may be calculated. Table 2 generates these pieces of information. The treated data revealed that TVET- agriculture interactions did not significantly translate into genuine productivity in agriculture implying a subsequent sticky release of poor from the current condition. Gerson (1998) and Briones (2013) said that agricultural neglect - inadequate in-placed production support like irrigation infrastructure, farm-to-market roads, post- harvest facilities, and performance like this posed problems on food sufficiency - worsens poverty conditions.

Table 2. Gross Domestic Product, Agriculture, Industry and Services Growth of Output (%), TVET Implementation, TVET Interactions, Philippines, 1985- 2012

Year	GDP	Agriculture	Industry	Services	TVET	Agr*TVET	Industry* TVET	Services* TVET
1985	-7.3	-1.9	-15.7	-2.1	0	0	0	0
1986	3.4	3.7	2.3	4.2	0	0	0	0
1987	4.3	3.2	4	5.2	0	0	0	0
1988	6.8	3.2	8.8	7.2	0	0	0	0
1989	6.2	3.0	7.4	7	0	0	0	0
1990	3	0.5	2.6	4.9	0	0	0	0
1991	-0.6	1.4	-2.7	0.2	0	0	0	0
1992	0.3	0.4	-0.5	1	0	0	0	0
1993	2.1	2.1	1.7	2.5	0	0	0	0
1994	4.4	2.6	5.8	4.2	0	0	0	0

Year	GDP	Agriculture	Industry	Services	TVET	Agr*TVET	Industry* TVET	Services* TVET
1995	4.7	0.9	6.7	5.0	1.0	0.85	6.72477	33.7499394
1996	5.9	3.8	6.4	6.4	1.0	3.82	6.43561	41.0255979
1997	5.2	3.1	6.1	5.4	1.0	3.09	6.14413	33.2896950
1998	-0.6	-7.0	-2.7	2.8	1.0	-6.9719	-2.74193	-7.73095389
1999	3.1	9.6	-1.5	4.5	1.0	9.64983	-1.48155	-6.70235441
2000	4.4	3.4	6.5	3.3	1.0	3.38442	6.54646	21.6425967
2001	2.9	3.4	1.0	4.0	1.0	3.44356	0.96135	3.88025855
2002	3.6	3.3	2.9	4.2	1.0	3.3202	2.89008	12.2065707
2003	5.0	4.7	4.3	5.5	1.0	4.66988	4.27549	23.4951002
2004	6.7	4.3	5.2	8.3	1.0	4.3183	5.23096	43.1845041
2005	4.8	2.2	4.2	5.8	1.0	2.2442	4.19059	24.2434431
2006	5.2	3.6	4.6	6.0	1.0	3.6416	4.60951	27.7566254
2007	6.6	4.7	5.8	7.6	1.0	4.72616	5.76798	43.7193849
2008	4.2	3.2	4.8	4.0	1.0	3.22122	4.80777	19.1665116
2009	1.1	-0.7	-1.9	3.4	1.0	-0.7186	-1.91685	-6.51441472
2010	7.6	-0.2	11.6	7.2	1.0	-0.1625	11.5753154	82.892602
2011	3.6	2.6	1.8	4.9	1.0	2.59105	1.81450539	8.93447406
2012	6.8	2.8	6.8	7.6	1.0	2.80979	6.83304318	52.0693888

The equation that models the relative effect of TVET is as follows:

A number of points surfaced. One is that TVET influenced the dynamic activities of both the industrial and service sectors but not on the agriculture sector. Another is that the industry sector coefficient exhibits an unexpected negative sign. By inspection, TVET coefficients are rather small and therefore slow. The declining effect of the industrial growth factored in with TVET can imply exodus of newly skilled workers away from the industrial sector and find meaningful either in the service sector or overseas. However, the inferential result does not back this up. The service sector's impact factored in with TVET, although positive, is very nil (0.015). Hence, it is more correct taking the inference that the negative value in the industry*TVET coefficient implies exodus of Philippine skilled labor outside Philippine shores.

NEDA (2013) has characterized the reduced manufacturing sector share to GDP and declining gross domestic investment rate to have been caused largely by the absence of structural transformation from agriculture to manufacturing (Aldaba, 2014). Poorly, it performed and showed low rates of growth (Luken, 1999). Even after 2000, the country ranked lowest in the share of the industry sector (i.e., manufacturing plus mining plus construction) to total output in 2003, which is marginally lower than

Singapore that has virtually no mining industry (Intal & See).

Only in the service sector that TVET initiative showed positive effects. From 2000 to 2010, it contributed over 50% of the country's growth as the country shifted to exporting services from exporting manufactured goods. Mitra (2013) described this to have exceeded the industry sector in its share to the GDP. Specifically, it is the information technology-business process outsourcing (IT-BPO) and tourism sectors to drive the economy toward achieving sustainable and inclusive growths (Ghani, 2010), and (Pasadilla, 2006 as cited in Mitra 2013).

Given the relative performance of the major sectors, agriculture sector's performance is rather unpromising and bleak. It is the country's largest sector employing more than 75% of the Filipino poor but overtime, its growth was stimulated by other factors and not through the TVET efforts. If this continues, apparently, the agriculture sector will receive insignificant number of workers who are technically skilled and are able to get into productive and creative undertakings.

CONCLUSIONS

The enactment of TESDA in 1994 should have brought structural growth, reduced poverty and human development. The multiple regression technique, with GDP growths as a function of growths in agriculture, industry, services sectors and a dummy variable for TVET and its interactions, showed that from 1985 to 2012, while TVET relates significantly to real GDP growths 99%, its impact is unfelt in the agriculture sector, the largest employing sector of the country. Moreover, although its effect is significant in services sector, the impact is rather low and consistently small. Finally, TVET's effect to the industry led to the release of more individuals, now skilled, to find overseas work and not in the industry, they serve. Consequently, TVET benefits directly other economies instead and only later the home country. Meanwhile, poverty in Philippine society remains a sticky challenge.

RECOMMENDATIONS

The study needs further improvement for structural stability. It requires further scrutiny in establishing a more stable model forecast. Moreover, it is essential for TESDA and TVET to revisit its curriculum and trainings and verify if the designed courses also advance the specific development needs of the agriculture sector. Artisanry, creativity and a strong sense of farm consciousness and environment friendliness, will assure the country of a stable agriculture sector, with a vibrant agribusiness component on it. An effective technology transfer occurs if it leads and if the outcomes translate to rural development (Ordonez, 2015). Food security is an essential requirement for a genuine growth and development. Insha'Allah (May God will it).

Lastly, the writer suggests the following areas of study;

- a. Investments Human Capital Formation Investments and TVET
- b. Curriculum Revision of TVET Courses: Significance of Micro-Finance
- c. Family Fiscal Management and TVET

Appendix 1. Gross Domestic Product, Agriculture, Industry and Services Growth of Output (%), Philippines 1985- 2012

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1985	-7.3	-1.9	-15.7	-2.1
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1987	4.3	3.2	4	5.2
1988	6.8	3.2	8.8	7.2
1989	6.2	3.0	7.4	7
1990	3	0.5	2.6	4.9
1991	-0.6	1.4	-2.7	0.2
1992	0.3	0.4	-0.5	1
1993	2.1	2.1	1.7	2.5
1994	4.4	2.6	5.8	4.2
1995	4.7	0.9	6.7	5.0
1996	5.9	3.8	6.4	6.4
1997	5.2	3.1	6.1	5.4
1998	-0.6	-7.0	-2.7	2.8
1999	3.1	9.6	-1.5	4.5
2000	4.4	3.4	6.5	3.3
2001	2.9	3.4	1.0	4.0
2002	3.6	3.3	2.9	4.2
2003	5.0	4.7	4.3	5.5
2004	6.7	4.3	5.2	8.3
2005	4.8	2.2	4.2	5.8
2006	5.2	3.6	4.6	6.0
2007	6.6	4.7	5.8	7.6
2008	4.2	3.2	4.8	4.0
2009	1.1	-0.7	-1.9	3.4
2010	7.6	-0.2	11.6	7.2
2011	3.6	2.6	1.8	4.9
2012	6.8	2.8	6.8	7.6

(Asian Development Bank, various years)

LITERATURE CITED

- Aldaba, R. (2014). *The Philippine Manufacturing Industry Roadmap: Agenda for New Industrial Policy High Productivity Jobs, and Inclusive Growth*. Metro Manila: Philippine Institute for Development Studies.
- Asian Development Bank. (various years). *Key Indicators for Asia and the Pacific*. Metro Manila: Asian Development Bank.
- Asian Development Bank. (2015). *South Asia Project Brief: Nepal; Skills for Employment Project*. Asian Development Bank.
- Asian Development Bank. (2014). *Technical and Vocational Education and Training in the Socialist Republic of Vietnam: An Assessment*. Mandaluyong City: Asian Development Bank.
- Briones, R. M. (2013). *Impact Assessment of the Agricultural Production Support Services of the Department of Agriculture (DA) on the Income of Poor Farmers/ Fisherfolk: Review of the Evidence*. <http://www.dbm.gov.ph/Department of Budget and Management>.
- Gerson, P. (1998, September). *Poverty and Economic Policy in the Philippines*. Retrieved June 3, 2015, from International Monetary Fund: <http://www.imf.org/external/pubs/ft/fandd/1998/09/gerson.htm>
- Ghani, E. (2010). *The Service Revolution in South Asia*. New York: Oxford University Press.
- Gujarati, D. (2010). *Essentials of Econometrics*. New York: McGraw-Hill/Irwin.
- Intal, P. S., & See, E. (2015) *Whither the Philippine Manufacturing Sector: Looking Back, Way Forward*. Metro Manila: http://www.dlsu.edu.ph/research/centers/aki/_pdf/_concludedProjects/_volumeI/IntalSee.pdf.
- Luken, R. (1999). *Industrial Policy and the Environment in the Philippines*. Makati: United Nations Industrial Development Organization-Philippines.
- Mitra, R. M. (2013, September). *Leveraging Service Sector Growth in the Philippines*. ADB Economics Working Paper Series. Mandaluyong City, Metro Manila, Philippines: Asian Development Bank, Philippines.

- National Economic Development Authority. (2013). *Competitive Industry and Service Sector*. Pasig, Philippines: NEDA.
- National Economic Development Authority. (2013). *Philippine Development Plan 2011-2016: Competitive Industry and Service Sector*. Pasig: National Economic Development Authority.
- National Economic Development Authority. (2013). *Philippine Development Plan: Competitive and Sustainable Agriculture and Fisheries Sector*. Pasig, Philippines:
- NEDA. National Economic Development Authority. (2014). *The Philippines Fifth Progress Report: Millennium Development Goals*. Pasig City: National Economic and Development Authority and United Nations Development Program.
- Ordenez, E. (2015, June 25). *Research Can Lead to Reforms*. *The Inquirer*.
- Pasadilla, G. (2006). *The Global Challenge in Services Trade: a Look at Philippine Competitiveness*. Manila: Philippine Institute for Development Studies.
- The World Bank. (March 2014). *Philippine Economic Update: Pursuing Inclusive Growth through Sustainable Reconstruction and Job Creation*. The World Bank.
- Usui, N. (2012). *Taking the Right Road to Inclusive Growth: Industrial Upgrading and Diversification in the Philippines*. Mandaluyong: Asian Development Bank.