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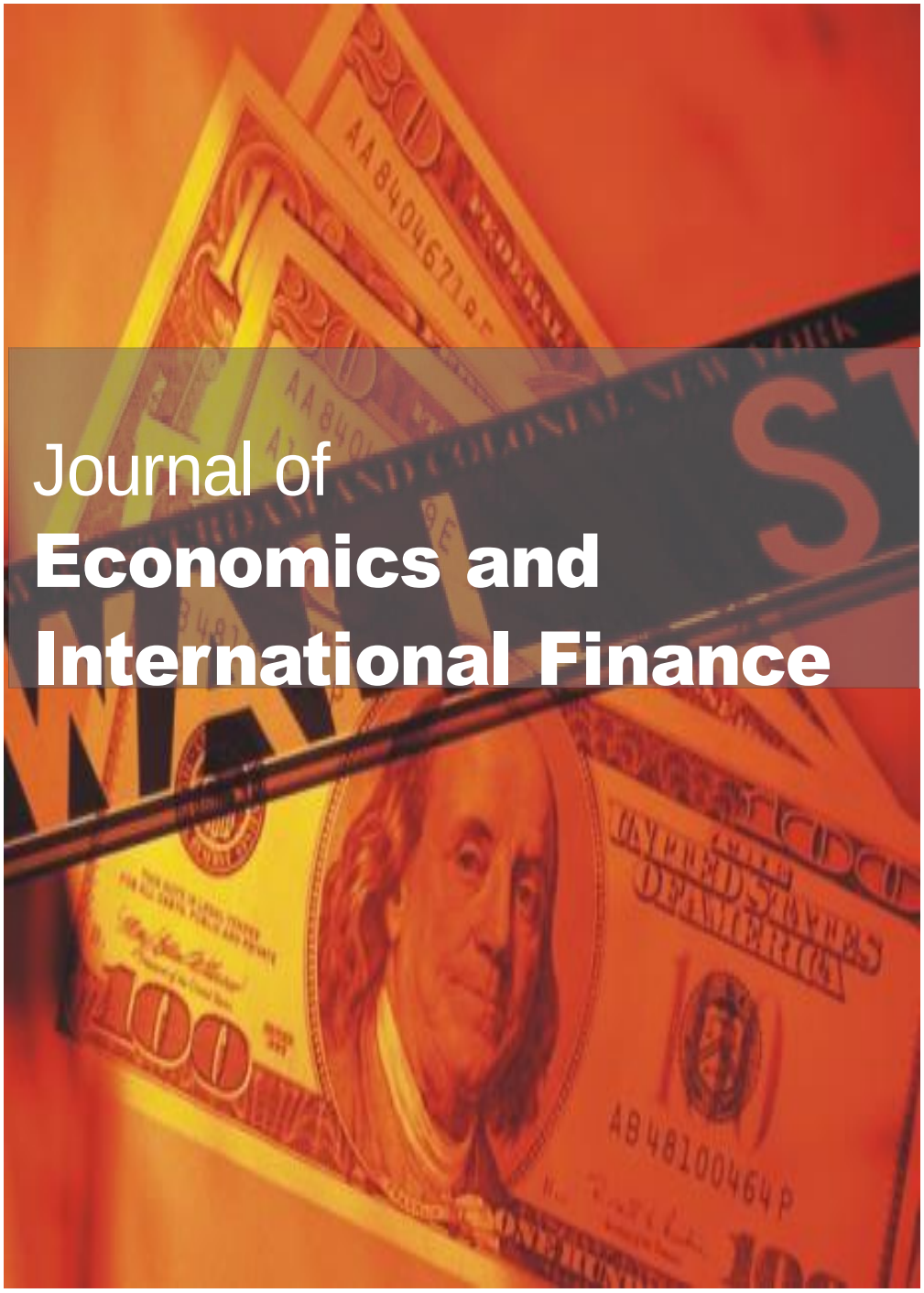

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Table of Content

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Journal of Economics and International Finance

Full Length Research

Comparative migration studies of Burmese, Cambodian and Laotian migrants in Thailand: Multivariate approach

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The paper outlines main economics factors determining migrant workers to Thailand, and the comparative studies between migrants, that are Myanmar, Cambodia and Laos. This research is quantitative in nature using logistic regression analysis. The results indicate demand on migration of Burmese migrants' relevance to four factors, two related to personal factors (employment and past income) and two related to country of origin (poverty and opportunity of career at home). While it reaches to five factors which correlate to the demand on migration of Cambodian migrants separating in three components, that are, personal factor (educational level), country of origin factors (difficulties of finding work and welfare at home country), and destination factors (non-farm employment and opportunity to get work). Finally, only the personal factor plays an important role on the demand on migration of Laotian people. These are the status of marriage, employment, attitude, having own house and number of family member in destination.

Key words: International migration, Burmese, Cambodian, and Laotian migrants, migration motives.

INTRODUCTION

Thailand has been a crossroads for migration within South-East Asia for centuries. Long before formal systems were established to regulate cross-border movements, large numbers of people entered or were resettled into the country's territory. As a result, the population of Thailand today is more ethnically diverse than is typically acknowledged, including Chinese, Malay, Karen, Shan, Mon, Khmer, Lao, Indian and others. Nation-building efforts since the late nineteenth century led to systematic cultural and linguistic assimilation of many of these groups but the more recent arrival of millions of migrant workers from neighboring countries has been greeted with a more mercurial policy response. United Nation (2019)'s report on Thailand migration asserts that the number of non-Thai residents within the country has increased from an estimated 3.7 million in 2014 to 4.9 million in 2018, which includes approximately 3.9 million migrant workers from Cambodia, Myanmar, Lao and Vietnam (United Nation, 2019).

The large scale of cross-border migrants from Myanmar, Cambodia, and Lao PDR to Thailand started during the 1990s to escape poverty and political conflict.

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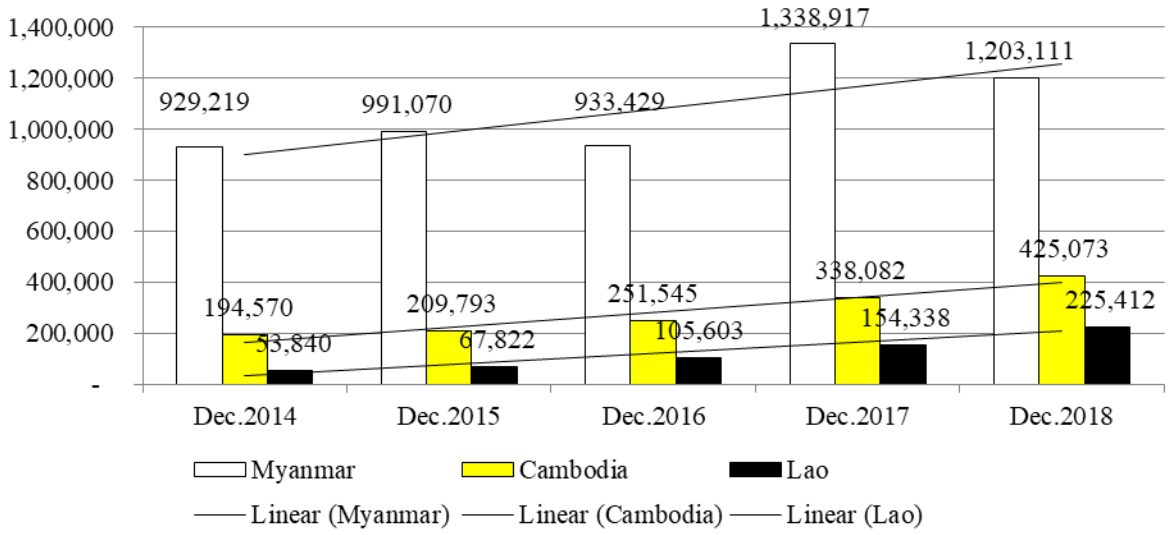

Figure 1. Migrant workers based on the type of nationality prove and MOU classified by nationalities.
Source: Ministry of Labor (2019).

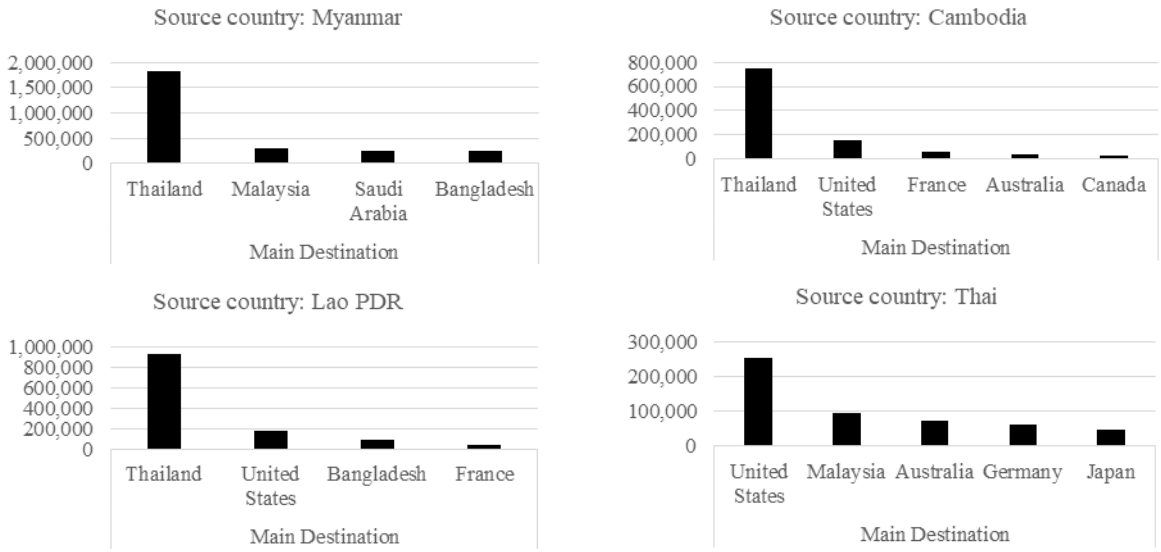

Figure 2. Main Destination of Migrants in 2017.
Source: World Bank (2018).

Thailand is as the magnet of migration in this region due to the economic boom during that decade. Furthermore, Thailand's wage rate is quite high compared with the neighboring countries. The other incentive for migration is Thailand's export which has dramatically increased. In addition, Thailand is the low cost investment base for multinational enterprise, which leads the country's economic growth to reach double digit per year. As a result, the country is ranked into a middle income country and absorbs the greatest influx of labor migration in Asia. The legal migration from the neighboring countries at the end of 2018 stands at nearly 2 million. Of these, about 1.2 million were migrants of Myanmar, which is the major group, followed by Cambodia and Lao migrants (Ministry of Labor, 2019) (Figure 1).

Figure 2 illustrates main destination of migrants in 2017. Thailand is the most favorite destination of the migrants from Myanmar, Cambodia and Lao. For the

Myanmar migrant, main destination to migrate are Thailand, Malaysia, Saudi Arabia and Bangladesh. From the point of view of Cambodian migrant, they are favorable to migrate to Thailand, United States, France, Australia and Canada. In the case of Lao migrants, Thailand is the best choice, followed by the United State, Bangladesh and France. Finally, Thai migrants mostly prefer to migrate to the United State, thereafter, Malaysia, Australia, Germany and Japan, respectively.

International migration in Thailand is heavily influenced by geography, with movements mostly taking place between neighboring countries. These movements are often driven by economic and labor market disparities, which cause migrants to migrate from lower-income to higher-income countries. The migrants help drive the country's export-oriented economy and contribute to the high GDP growth. In countries of origin, migration has an even larger impact. Within Southeast Asia, there exists a strong correlation between migration and poverty reduction (Ladek, 2018). Migrants from Thailand often remit a substantial part of their income to their families back home. Therefore, the earnings sent home contribute to considerable improvement in the welfare of their families. The benefits of migration are high as well as the diversion of migration. It is also the challenges of Thai government to solve the problems occurring from huge migration such as illegal migration, human trafficking, debt bondage, labor exploitation and abuse. Therefore, the research on the comparison of neighboring countries migration to Thailand plays an important role in the regional development. Also, the treatment of the destination country is under discussed in the public and policy debates at the national and regional level.

SOURCES OF DATA

The analysis used in this research is based on a survey of migrant worker research project, supported by a grant by Kasetsart University Research and Development (KURDI), Kasetsart University. The survey was conducted in 2018. The survey interviewed migrant workers who are working in Thailand from three source countries: Myanmar, Cambodia and Laos. This is a cross sectional study involving 511 migrant workers at labor force ages extracted from the migrant workers who performed their legal migrant worker registration at One Stop Service Center, Chonburi province, Thailand. For data sampling, purposive sampling technique was used. According to Hejase and Hejase (2013: 360), for a large population with 50% equally distributed gender, e=5% (maximum tolerance away from the mean) and 95% statistical significance (Z=1.96), then the minimum sample size needed is 384 migrant workers. The main purpose of the survey is to gather information about important socioeconomic, living conditions, problems, and migration motivation.

METHODS

This research is quantitative in nature and uses descriptive statistics and logistic regression analysis. Descriptive statistics was used to analyze the patterns of important socioeconomic, demographic and migration related characteristics, and the logistic regression analysis has been applied to identify main economics factors determining migrant workers to Thailand, and including the comparative studies between countries of origin of migrants. The logistic model was developed by Walker and Duncun (1967). The logistic regression model can be employed to explore migration factors and also to predict the probability of migration. The model is widely used to identify the influence of various socioeconomic and demographic characteristics for controlling the effect variables on the likelihood of the occurrence of the event of interest. In logistic model, a migrant who has a willingness to migrate in the future is treated as dependent variable which is a dummy variable and it is classified in the following way:

Y = 1, if the migrant worker is willing to migrate in the future.
Y = 0, if the migrant worker is not willing to migrate in the future.

The explanatory variables that are used in this model are explained in the following equations:

$$\Pr(Y=1) = \frac{1}{1+e^{-x}} \quad (1)$$

$$Y = \beta_0 + \beta_1 \text{SEX} + \beta_2 \text{AGE} + \beta_3 \text{EDU} + \beta_4 \text{DEBT} + \beta_5 \text{STATUS} + \beta_6 \text{UNEMPLOY} + \beta_7 INCOME_{t-1} + \beta_8 \text{INCOME} + \beta_9 \text{EMPLOYRT} + \beta_{10} \text{ATTITUDE} + \beta_{11} \text{OWNHOUSE} + \beta_{12} \text{FAMMEMB} + \beta_{13} \text{DIFFICULT} + \beta_{14} UNEMPLOY_{t-1} + \beta_{15} \text{DRYWEAT} + \beta_{16} \text{POOR} + \beta_{17} \text{LOWINCOM} + \beta_{18} \text{POLITIC} + \beta_{19} \text{OPPORTU} + \beta_{20} \text{WELFARE} + \beta_{21} \text{DISTANCE} + \beta_{22} \text{DIFINCOM} + \beta_{23} \text{POPDENS} + \beta_{24} \text{AREA} + \beta_{25} \text{NONFARM} + \beta_{26} \text{GETJOB} + \varepsilon_i \quad (2)$$

The explained variables expected to affect migration demand are classified into 3 factors:

(1) Personal factors: Gender (SEX), Age (AGE), Educational level (EDU), Debt (DEBT), Marital status (STATUS), Unemployment of labor (UNEMPLOY), Income before migration of labor ($INCOME_{t-1}$), Present income of labor (INCOME), Ratio of employed family worker to total family members (EMPLOYRT), Knowledge and attitude toward destination country (ATTITUDE), Having own house at home country (OWNHOUSE), and Number of family member living in destination country (FAMMEMB).
(2) Factors related to home country or country of origin: Difficulties in finding work at home country (DIFFICULT), The unemployment of worker at home country ($UNEMPLOY_{t-1}$), Arid climate that is not favorable for agriculture at home country (DRYWEAT), Difficulties and poverty at home country (POOR), Low wage level at home country (LOWINCOM), Unstable social and political at home country (POLITIC), Career achievement opportunities at home country (OPPORTU), and Welfare and public utilities at home country (WELFARE).
(3) Factors related to destination country: Distance between the country of origin and destination country (DISTANCE), Income difference between destination country and country of origin

Table 1. Minimum wage and wage equality.

Country	Daily minimum wage (US$) 2011	Rank	Daily minimum wage (US$) 2017	Rank	Wage equality 2017	World rank 2017
Thailand	9	1	9.02-9.32	1	0.763	18
Lao PDR	3	2	3.68	3	0.741	24
Cambodia	2	3	4.67	2	0.730	28
Myanmar	0.52	4	2.68	4	N/A	N/A

Source: Subhan (2018); From World Economic Forum (2017).

(DIFINCOM), Population density between destination country and country of origin (POPDENS), Area size ratio between destination country and country of origin (AREA), Working on non-farm sector at destination country (NONFARM), Having a work position at destination country (GETJOB).

RESULTS

Research results are divided into three aspects. The first is the economics analysis of migration motives from macroeconomic data. The second is the descriptive statistics of the migrant workers. The last is the quantitative analysis of migration determinants.

Qualitative analysis of motives of migration

There are various motives why the migrants decide to leave their home country. Generally speaking, migration incentive can be divided into two categories of push and pull factors. Incentives that may attract people away from their country are pull factors and incentives that encourage people to decide to leave their country are push factors.

Wage difference between the studies' countries

The most important of the economic factors is wage difference. It is undeniable that Southeast Asia is an attractive manufacturing and production hub for foreign investors. One of the factors that can be pinned is that workers in the region are generally paid a low wage for laborious and often back-breaking work. Daniel Kostzer, a senior regional wage specialist for the International Labor Organization (ILO) (Arief, 2018), states that it is the discipline and hardworking nature of workers in the region that form the main pulling factor. Even if minimum wages are to be increased, the character and resilience of these workers should be enough to make international companies in the region want to stay (Arief, 2018). Reference to the analysis of minimum wage, reveals that Thailand has the highest daily minimum wage around US$ 9 per day. Thailand is therefore attracting a huge migration flow from neighboring migrants. In 2011, Lao PDR was the next highest daily minimum wage. It turned out that Laotian migrants in Thailand are the least. The most noticeable feature is minimum wage of Myanmar was the lowest, about US$0.52 per day (Table 1). For this reason, Burmese migrants made up the largest group of migrants in Thailand (International Organization for Migration, 2018). A further feature is that despite the fact that there was a surge in minimum wage of Cambodia, the out migration is still high because the wage rate of Thailand is considerably greater. Another point is wage equality. In an article by Pay Equity Commission (2019), it suggests that it is the equal pay for work of equal value. The value of work is based on the level of skill, effort, responsibility and working condition. Employer pays to female jobs at least the same as male jobs if they are of comparable value. As shown in Table 1, Thailand's wage equality ranks first, follow by Lao PDR and Cambodia.

In addition, nominal wages and real wages differ depending on the place and country. Wages refer to real average monthly wages of employees. To adjust for the influence of price changes over different time periods, wages are measured in real terms, that is, the nominal wage data are adjusted for consumer price inflation in the respective country (International Labor Office, 2018). Table 2 shows different nominal wages between the study countries. Nominal wage of Cambodia had been increasing annually. Thailand wage had slightly rose from 2014 to 2016. Given 2015 data, average wages were converted in US dollar; Thailand nominal wage was doubled when compared with Cambodia and was four times that of Myanmar's wages.

When the number of employees in each country is held constant, the global wage growth rate can be expressed as a weighted average of the wage growth rates in the individual countries. Real wage growth refers to the year-on-year change in real average monthly wages of all employees (International Labor Office, 2018: 102). To interpret real wage growth, it can be explained that real wage growth of Thailand reached a peak at 8% in 2014. After that, the percentage of its growth shrank to 1.6% in 2016. In the meantime, there was just over 20% of real

Table 2. Country-specific monthly nominal wage, 2013-2017.

Country	Currency	2013	2014	2015	2016	2017	Source
Thailand	THB	12,003	13,244	13,487 ($375.3)	13,729	-	National Statistics Office of Thailand
Lao, PDR	LAK	-	-	-	-	2,354,377 ($ 283.77)	ILOSTAT
Cambodia	KHR	505,186	642,000	788,000 ($194.36)	887,000	-	National Institute of Statistics
Myanmar	MMK	-	-	124,157 ($94.877)	-	181,917 ($133.71)	Ministry of Labor, Employment and Social Security

On December 31, 2015 exchange rate of THB per 1 USD equals 35.94 THB, LAK per 1 USD equals 8, 106.94 LAK, KHR per 1 USD equals 4,054.31 KHR, MMK per 1 USD equals 1,308.61 MMK.
On December 31, 2017 exchange rate of LAK per 1 USD equals 8,296.87 LAK, MMK per 1 USD equals 1,360.5 MMK.
Source: International Labor Office, p. 113-114.

wage growth of Cambodia between 2013 and 2015; however, there was a sharp real wage growth which plummeted in 2016. That's why the number of Cambodian migrants rose sharply. Conversely, Myanmar's real wage growth was steadily at 14.9% between 2016 and 2017. Hence, although Thailand had a plunge of real wage growth, but the nominal wage remained the highest. Wage is the pull factor. Thus, expected income differentials factors are still the essential criteria (Table 3).

Unemployment rate

The second economic factor which is a motive for migration is the difference of the unemployment rate between source country and destination. Generally, people will migrate only, if the country they will move to has higher chances and possibilities in getting employment. The reason is, if unemployment is on the rise, migrant workers are vulnerable; since in case of doubt natives will be preferred compared to migrants. They often do not enjoy the same rights and protection as natives, which can lead to the result that illegal employment will arise aligned with low wages. Table 4 shows that the highest share of unemployment in Myanmar affects directly Burmese workers, pushing them to migrate abroad to find work. On the other hand, in the neighboring country, Thailand's unemployment rate hits a bottom. Moreover, more important than the migration decision is the unemployment situation in the home country. The worse the unemployment situation in the country is, the higher the possibility of workers to decide to migrate (Table 4).

Economic growth

Economic growth is expected to be the third economic factor which can be the push factor if the country of origin of the migrant encounters economic recession and it can be the pull factor if the destination of migration country has economic stability. Migration inflow of neighboring countries to Thailand relies on GDP per capita. Table 5 shows that during 2013 to 2017, Thailand had low economic growth but Myanmar, Cambodia and Laos had the high economic growth. However, when comparing the GDP per capita it is explicitly that Thailand's GDP per capita is the highest among these countries. This may be the incentive of migration to Thailand.

Myanmar economy expanded to 6.8% in 2017 from 5.9% in 2016 (Table 5). Main factors are infrastructure investment, export and tourism. Infrastructure investment plays an important role to drive economic development especially Chinese investment and the linkage in Belt and Road Initiative project. However, the severe and continuous depreciation of the money resulted in Myanmar economy being vulnerable. Myanmar economic growth in 2019 is expected to increase which is a robust regional activity but suffers from the downside risks resulting from the deficit of current account, trade account and fiscal account from the adverse weather and potential loss of preferential market access to the EU (Focus Economics, 2019).

Cambodia is an attractive investment destination for businesses looking to expand in ASEAN. The country has recovered from a troubled and violent 20th century past and aims to now secure a place on the global economic playing field. With a steady economic growth of around 7% in recent years, which is forecasted to continue in 2019, Cambodia is on a steady path of economic improvement. The growth rate is the highest amongst the fast-growing ASEAN nations. However, large-scale reforms are needed to support this growth and to make the country

Table 3. Country-specific Real Wage Growth, 2013-17.

Country	2013	2014	2015	2016	2017
Thailand	5.8	8.3	2.8	1.6	N/A
Lao, PDR	N/A	N/A	N/A	N/A	N/A
Cambodia	21.9	22.4	21.3	9.3	N/A
Myanmar	N/A	N/A	N/A	14.9	14.9

Source: International Labor Office (2018: 118).

Table 4. Labor force, employment and unemployment of **Myanmar, Cambodia, Lao** and Thailand in 2011 **(B.E.2554).**

Country	Labor force (People)	Employment (People)	Unemployment (People)	Unemployed to employed (%)	Rank
Myanmar	32,530,000	30,740,850	1,789,150	**5.5**	1
Cambodia	8,800,000	8,650,400	149,600	**1.7**	3
Lao	3,690,000	3,597,750	92,250	**2.5**	2
Thailand	39,620,000	39,342,660	277,340	**0.7**	4

Source**:** Ministry of Labor (2011).

Table 5. Economic growth of the Myanmar, Cambodia and Lao.

Country	2013	2014	2015	2016	2017
Myanmar					
GDP per capita (USD)	1,188	1,231	1,119	1,157	1,166
GDP (USD bn)	60.5	63.3	63.2	60.5	61.4
GDP, annual variation in %	8.4	8	7	5.9	6.8
Cambodia					
GDP per capita (USD)	1,009	1,091	1,158	1,269	1,385
GDP (USD bn)	15.2	16.7	18.0	20	22.2
GDP, annual variation in %	7.4	7.1	7	7	7
Lao					
GDP per capita (USD)	1,895	2,075	2,217	2,400	2,523
GDP (USD bn)	11.9	13.3	14.4	15.8	16.9
GDP, annual variation in %	8	7.6	7.3	7	6.9
Thailand					
GDP per capita (USD)	6,306	6,088	5,975	6,122	6,738
GDP (USD bn)	421	408	402	413	456
GDP, annual variation in %	2.7	1	3.1	3.3	4.0

Source: Focus-Economics (2019).

competitive on a global level (Flintrop, 2019).Lao had economic expansion of 6.8% in 2018 but it contained the increasing challenge in the risk management of the fiscal deficit and current account deficit under the tight global finance. Although Laos PDR had solid regional growth, exports and healthy inward investment, but tourist arrivals have likely disappointed in 2018. Moreover, recent Central Bank data shows that although goods exports jumped year-on-year in the third quarter, the current account deficit continued to widen on surging goods

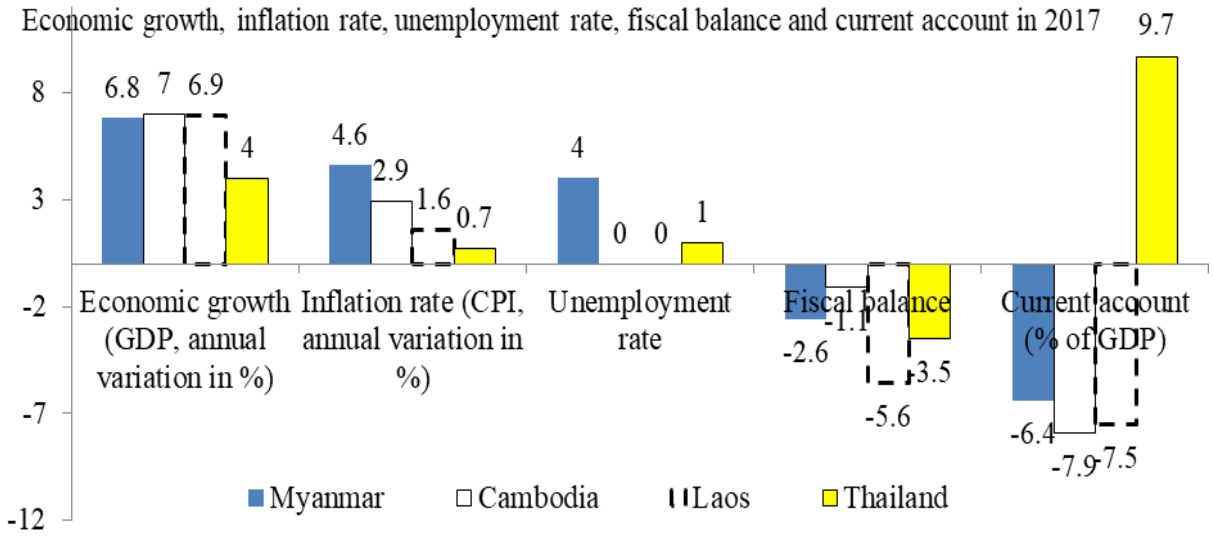

Figure 3. Economic growth, inflation rate, unemployment rate, fiscal balance and current account in 2016 of Myanmar, Cambodia, Laos and Thailand. Unemployment rate data of Cambodia and Lao in 2017 are not available.
Source: Focus-economics (2019).

imports, likely linked to infrastructure projects such as the China-Laos railway. On the political front, Laos inked a deal to export energy to Cambodia, which will support the external sector and the administration's aims of turning Laos into a regional energy hub. Growth should be solid going forward, the increased power generation, ongoing FDI inflows and infrastructure investment. However, softer momentum in China could have a dampening effect, while a weak external position, global financial tightening and vulnerability to weather fluctuations pose downside risks. Focus Economics Consensus forecast panelists expect GDP to expand to 6.8% in 2020 (Focus Economics, 2019).

Figure 3 summarizes the macroeconomic data of Myanmar, Cambodia, Laos and Thailand. The information in 2017 showed the high economic growth of Cambodia, Lao and Myanmar to be around 7% low to the economic growth of Thailand. Myanmar had economic growth but the inflation rate and unemployment rate were very high. The country had minus in fiscal balance and current account. Cambodia had high economic growth but its growth was interrupted by current account and fiscal balance deficit. Lao had average economic growth of 7% but Lao had a deficit of current account and fiscal balance. In 2016, Laos had public debt of 56.4% of GDP, external debt of 85.6% of GDP, inflation of 1.6% but the country had the positive international reserves. Finally, Thailand had the lowest economic growth of 4%, inflation rate of 0.7% and unemployment rate of 1%. Although fiscal balance was deficit but the current account was the highest at 9.7% (Focus-Economics, 2019).

Geography

As the country is located nearby, it is also the main motives of migration. Lao PDR is the closest to Thailand, distance between countries are about 646 km. Cambodia is not far from Thailand about 769.6 km. So, more than four hundred thousand Cambodian workers migrate to Thailand. Myanmar is not too far from Thailand (about 1,219.8 km), so almost two million of Burmese workers stay in Thailand. Summing it up, geography is an important factor to regard because it is related to social and cultural factors, which can influence the decision on migration. People in neighboring countries do have low language barriers; close social relationships and social capital, and low discrimination towards foreigners.

Human development index

Besides income difference, unemployment rate, and geography, human development index (HDI) plays a great role as well. Table 6 provides information about HDI index in 2018 of the studied countries. Out of the 189 countries for which the HDI is calculated, Thailand's HDI ranking 83th refers to high human development group. Next are Laos PDR, Cambodia and Myanmar, ranked at 139, 146 and 148th, respectively. The analysis of the relationship of HDI and number of migrants can be concluded that country's HDI is consistent with the number of emigrants. For instance, Myanmar's HDI was the lowest. This has drawn attention to the fact that

Table 6. Human Development Index in 2018 (B.E.2561).

Index	Thailand	Lao	Cambodia	Myanmar
Ranking from HDI index among 4 countries	1	2	3	4
Ordering of HDI index compare to the world	83	139	146	148
Human Development Index: HDI (value)	0.755	0.601	0.582	0.578
Meaning of HDI	High	Low	Low	Low
Life expectancy at birth (years)	75.5	67	69.3	66.7
Meaning of life expectancy at birth	High	Low	Medium	Low
Expected years of schooling (years)	14.7	11.2	11.7	10
Mean years of schooling (years)	7.6	5.2	4.8	4.9
Meaning of mean year of schooling	High	Medium	Medium	Medium
Gross National Income: GNI per Capita (PPP$)	15,516	6,070	3,413	5,567

Human development index value more than 0.894 mean very high human development, 0.757-0.893 mean high human development, 0.645-0.756 mean medium human development, 0.504-0.644 mean low human development. Life expectancy of more than 79.5 mean very high human development, 76-79.4 years mean high human developments, 69.1-75.9 mean medium human development, 60.8-69 mean low human developments).
Source**:** United Nations Development Program (2018).

Burmese's family migration already at record levels, rocketed to two million. According to other indices, Thailand has the longest life expectancy at 75.7 years, the highest expected years of schooling at 14.7 years, the highest mean years of schooling at 7.6 years, and the highest Gross National Income. These indices perceptively indicate the better quality of life and living standards, incentive in-migration (Table 6).

Descriptive analysis of migrants' sample

The first aspect describes socio demographics of migrant workers (Table 7). More than half of the migrant workers in Thailand are women. Therefore, many women are the main breadwinners for their families through their employment in Thailand (Table 8). Most of Myanmar and Cambodia workers are married, except Laos workers who are mostly single. Main range of the age is in the range of 21-40 years. There are 217 workers, 42%, who are in the age range of 21-30 years old. Another is 161 workers, 32% whose age are within 31-40 years old. Overall, 43% of migrants have attended primary school, 34% have the education below primary school and 23% have a secondary education. Most of Laos workers report that they have secondary education, accounting for 51%, while most of Myanmar workers (47%) are below primary school. The majority (52%) of workers do not have children in their family. The most common number of children in a family is 1, with 25% of workers. As for family size, 38% of migrant's families are currently living in three or four persons, following with 23% of migrants living in households with five or six persons. Most of Cambodia households are extended family, but most of Laos households are nuclear family. Of the 511 migrants, 188 migrated alone whereas 109 had migrated together with at least one other family member. Cambodia migrants mostly had four or more persons accompany them, while Laos migrants prefer to migrate alone.

In respect of the employment of migrants, the majority of the migrant households have one or two employees. About the main employment sector of migrants in Thailand, the construction sector employs 210 workers, service sector employs 135 workers, and industrial sector employs 80 workers. The majority of Cambodia and Myanmar migrants are contracted with construction sector, while Laos migrants are mostly work on service sector. According to the frequency that migrants come to Thailand, it indicates that most migrants are not entering for the first time, accounting to 55%. Migrants from Myanmar and Lao have more first time migrants than Cambodia. Note to the source of spending for migration to Thailand, most of the migrants use personal saving, amounting to 67%. About the process of working in Thailand, 58% of workers are persuaded to work in Thailand. Most of Myanmar workers come by themselves. Main reason of migration are seeking for better salary, reducing unemployment problem and outreaching the poverty.

The finance of migrants illustrates that the majority of migrants earn income in the range of 5,001-10,000 Baht per month (72%), followed by 124 migrants who report to earn income between 10,000 and 15,000 Baht per month (24%), 9 migrants in this study were identified as receiving monthly income less than 5,000 Baht per month, and 8 migrants receive income more than 15,000 Baht per month (Table 9). Regarding information about the migrant's expenses in Thailand, the majority of the migrants spent less than 5,000 Baht per month (57%), followed by 33% of migrants who spent between 5,001

Table 7. Socio Demographics of Migrant Workers.

Parameter	Myanmar	%	Cambodia	%	Lao	%	Total	%
Gender								
1. Female	79	53	107	51	89	59	275	54
2. Male	71	47	104	49	61	41	236	46
Status								
1. Married	86	57	153	73	57	38	296	58
2. Single	61	41	53	25	93	62	207	41
3. Others	3	2	5	2	0	0	8	2
Age								
1. 15-20 years	24	16	27	13	27	18	78	15
2. 21-30 years	63	42	77	36	77	51	217	42
3. 31-40 years	41	27	83	39	37	25	161	32
4. 41-50 years	20	13	22	10	8	5	50	10
5. >51 years	2	1	2	1	1	1	5	1
Education								
1. Below primary	71	47	70	33	34	23	175	34
2. Primary school	67	45	113	54	39	26	219	43
3. Secondary school	12	8	28	13	77	51	117	23
Number of children								
1. No	83	55	81	38	104	69	268	52
2. 1 person	31	21	63	30	34	23	128	25
3. 2 persons	22	15	46	22	6	4	74	14
4. 3 persons and above	14	9	21	10	6	4	41	8
Family size								
1. 1-2 persons	17	11	28	13	52	35	97	19
2. 3-4 persons	77	51	66	31	49	33	192	38
3. 5-6 persons	28	19	62	29	28	19	118	23
4. 7 persons and above	28	19	55	26	21	14	104	20
Number of accompany migrants								
1. Migrate alone	46	31	36	17	106	71	188	37
2. Migrate with one family member	38	25	51	24	20	13	109	21
3. Migrate with two members	26	17	37	18	13	9	76	15
4. Migrate with three members	20	13	18	9	1	1	39	8
5. Migrate with four or more	20	13	69	33	10	7	99	19

and 10,000 Baht per month. Interestingly, 42 migrants report that they live and have food with their employer without having to pay for food expenses and housing cost. According to the savings, almost all of the migrants can save money less than 5,000 Baht per month. On the same way, 88% of migrants do not have debt. About the remittance, family members of the migrants view that they benefit directly from having a relative aboard. About 51% of them send remittance to their home less than 5,000 Baht per month, whereas 190 out of total do not send remittance.

Determinants of Burmese migrants demand on migration

The result indicates that 66 migrants have the demand to

Table 8. Employment of Migrants.

Parameter	Myanmar	%	Cambodia	%	Lao	%	Total	%
Number of employee in household								
1. 1-2 persons	73	49	83	39	85	57	241	47
2. 3-4 persons	50	33	56	27	43	29	149	29
3. 5 persons and above	27	18	72	34	22	15	121	24
Sector								
1. Construction	64	43	116	55	30	20	210	41
2. Service	31	21	37	18	67	45	135	26
3. Production or industry	15	10	29	14	36	24	80	16
4. Housework	26	17	10	5	13	9	49	10
5. Agriculture and animal	8	5	9	4	0	0	17	3
6. Transport	3	2	7	3	1	1	11	2
7. Fishering	3	2	3	1	3	2	9	2
Number of time come to Thailand								
1. First time	83	55	72	34	77	51	231	45
2. Second time	28	19	69	33	40	27	137	27
3.Third or more	39	26	70	33	33	22	143	28
Source of money for migrating to Thailand								
1. Personal money	113	75	127	60	100	67	340	67
2. Borrow from bank	15	10	31	15	18	12	64	13
3. Borrow from employer	12	8	27	13	12	8	51	10
4. Borrow from agency	8	5	10	5	18	12	36	7
5. Sell assets	1	1	15	7	1	1	17	3
6. Not use money	1	1	1	0	1	1	3	1
Having people persuade to work in Thailand								
1. Yes	68	45	138	65	88	59	294	58
2. No	82	55	73	35	62	41	217	42
Reason of migration								
1. Better salary	58	39	56	27	44	29	158	31
2. Unemployment	27	18	74	35	38	25	139	27
3. Poverty	40	27	22	10	37	25	99	19
4. Follow with family	1	1	17	8	4	3	22	4
5. Having relatives in Thailand	6	4	6	3	7	5	19	4
6. Must response on family burden	6	4	8	4	3	2	17	3
7. Unstable social and politic	3	2	7	3	4	3	14	3
8. Others: natural disaster, minorities group, study, medical treatment	9	6	21	10	13	9	43	8

migrate in the future. The forecast model is correct at 56.1%. Conversely, 84 of migrants do not have demand on migration. The percentage corrected of this group is 77.4% (Table 10).

The effect of various types of explanatory variables on dependent variable named migration has been presented where regression coefficient with their corresponding standard error (S.E.) and significance level are disclosed. Regarding to the fitted model, all explanatory variables appeared at the significant prediction of demand on migration. In accordance with their importance, unemployment, income before migration, poverty situation

Table 9. Financial of the migrants.

Parameter	Myanmar	%	Cambodia	%	Lao	%	Total	%
Income (Baht/month)								
1. < 5,000 Baht	3	2	4	2	2	1	9	2
2. 5,001-10,000 Baht	107	71	138	65	125	83	370	72
3. 10,001-15,000 Baht	36	24	67	32	21	14	124	24
4. > 15,001 Baht	4	3	2	1	2	1	8	2
Expenditure (Baht/month)								
1. Employer pay for living cost	21	14	13	6	8	5	42	8
2. < 5,000 Baht	79	53	98	46	115	77	292	57
3. 5,001-10,000 Baht	47	31	94	45	26	17	167	33
4. > 10,001 Baht	3	2	6	3	1	1	10	2
Savings								
1. < 5,000 Baht	141	94	203	96	147	98	491	96
2. 5,001-10,000 Baht	6	4	5	2	2	1	13	3
3. > 10,001 Baht	3	2	3	1	1	1	7	1
Debt								
1. No debt	145	97	159	75	148	99	452	88
2. < 5,000 Baht	1	1	26	12	0	0	27	5
3. 5,001-10,000 Baht	1	1	10	5	0	0	11	2
4. > 10,001 Baht	3	2	16	8	2	1	21	4
Remittance (Baht/month)								
1.No	53	35	48	23	89	59	190	37
2. < 5,000 Baht	75	50	134	64	54	36	263	51
3. 5,001-10,000 Baht	16	11	26	12	7	5	49	10
4. > 10,001 Baht	6	4	3	1	0	0	9	2

and opportunity of career achievement have statistically significant effect on migration demand. From Table 11, determinants of Burmese demand on migration can be written as follow:

$$MIGRAT_{BURMESE}=-0.1043+0.8481\ UNEMPLOY+0.0001\ INCOME_{t-1}+1.5391\ POOR-0.3160\ OPPORTU+\varepsilon_i \quad (4)$$

where $MIGRAT_{BURMESE}$ is demand on migration of Burmese migrants (Migrant from Myanmar), UNEMPLOY is unemployment, $INCOME_{t-1}$ is income before migration of labor, POOR is difficulties and poverty consequence at home country, OPPORTU is career achievement opportunities at home country, and ε_i is random error term.

Determinants of Burmese migrants demand on migration consist of: (1) Personal factors, which are, the unemployment status and the income of migrants before migration; (2) Factors relating to country of origin, that are, the difficulties of finding work at country of origin, the poverty consequence at home country and the career achievement opportunities at home country.

Personal factors

Unemployment of labor: Unemployment is an important significant factor for migration. The regression coefficient (β_1) of UNEMPLOY variable is 0.848. It implies that if the unemployment incident of Burmese migrant worker increases 1 unit, it will lead to log (Odds) increase of 0.8481 and Exp(B) > 0. The increasing odds mean the chance of the Burmese migration incident will increase. Of course, the migrants who experience unemployment status are more likely to pursue other goals in migration.

Income before migration of labor: Income before migration has a little influence on Burmese's migration

Table 10. Classification table of determinants of Burmese migrants demand on migration.

Observed		Predicted demand to migrate in the future		Percentage correct
		Yes	No	
Demand on migration	Yes	37	29	56.1
	No	19	65	77.4
Overall percentage	-	-	-	68.0

Constant is included in the model. The cut value is 0.5. Total percentage of correcting forecast = [(37 + 65) / (66 + 84)] × 100 = 68%.
Total percentage of in correcting forecast = [(19 + 29) / (66 + 84)] × 100 = 32%.
Source: Own calculation.

Table 11. Variables in the equation of determinant of Burmese migrants demand on migration.

Variable	β_i	S.E.	Wald	df	Sig	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
UNEMPLOY	0.848	0.399	4.527	1.000	0.033	2.335	1.069	5.101
$INCOME_{t-1}$	0.000	0.000	4.394	1.000	0.036	1.000	1.000	1.000
POOR	1.539	0.508	9.200	1.000	0.002	4.661	1.724	12.600
OPPORTU	-0.316	0.123	6.566	1.000	0.010	0.729	0.573	0.928
Constant	-0.104	0.470	0.049	1.000	0.824	0.901	-	-

β is the coefficient ($\beta_0, \beta_1, \ldots, \beta_n$).
Source: Own calculation.

demand. The regression coefficients (β_2) of monthly income before migration variable is 0.0001. It explains that if income before migration of migrants increase 1 unit, log (Odds) will increase by 0.0001 which leads to Exp(B) > 0. The increase of the odds ratio is as a result of an increase in migration opportunity in the future.

Factors related to country of origin

Difficulties and poverty at home country: Poverty is the most important significant factor for migration demand. The regression coefficient (β_3) of POOR variable is 1.5391. An increase in the poverty incident by 1 unit will lead log(Odds) increase of 1.5391, which leads to Exp(B) > 0. Increasing the odds value means that the opportunity of migration will increase. As a consequence of the positive estimated coefficient, it indicates that poorer migrants are more likely to migrate than the richer migrants.

Career achievement opportunities at home country: β_4 is the coefficient of OPPORTU variable. The estimated coefficient is negative. If the career opportunity at home country of migrants increases by 1 unit, log (Odds) will decrease by -0.3160. The declining of odds ratio implies the opportunity to migrate will decrease. Thus, career successful migrants are less likely to migrate than migrant who lost a career opportunity.

Determinants of Cambodian migrants demand on migration

Table 12 shows the maximum likelihood model if only the intercept is included without any of the dependent variables in the analysis. The table describes the goodness of fit for the logistic model.
The equation of the logistic model is as follows:

$$MIGRAT_{CAMBODIA}=-5.6323+1.4498\ EDU+1.2151\ DIFFICULT+1.9191\ NONFARM+1.8263\ GETJOB-2.0200\ WELFARE+\varepsilon_i \quad (5)$$

where $MIGRAT_{CAMBODIA}$ is demand on migration of Cambodian migrants, EDU is educational level, DIFFICULT is difficulties in finding work at home country, NONFARM is working on non-farm sector at destination country, GETJOB is having a work position at destination country, WELFARE is welfare and public utilities at home country, and ε_i is random error term.

The aforementioned model is the result of the analysis of the correlation between the dependent variable and every independent variable build up the profile of the Cambodian migrants (Table 13). According to the fitted model, explanatory variables that are EDU, DIFFICULT,

Table 12. Classification table of determinants of Cambodian migrants demand on migration.

Observed		Predicted demand to migrate in the future		Percentage correct
		Yes	No	
Demand on Migration	Yes	37	31	54.4
	No	13	130	90.9
Overall percentage				79.1

Constant is included in the model. The cut value is 0.5. Total percentage of correcting forecast = [(37 +130) / (68+ 143)] × 100 = 79.15%. Total percentage of in correcting forecast = [(13 +31) / (68+ 143)] × 100 = 20.85%.
Source: Own calculation.

Table 13. Variables in the equation of determinant of Cambodian migrants demand on migration.

Variable	β_i	S.E.	Wald	df	Sig	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
EDU	1.450	0.307	22.331	1.000	0.000	4.262	2.336	7.777
DIFFICULT	1.215	0.444	7.506	1.000	0.006	3.371	1.413	8.039
NONFARM	1.919	0.770	6.205	1.000	0.013	6.815	1.505	30.849
GETJOB	1.826	0.495	13.635	1.000	0.000	6.211	2.356	16.375
WELFARE	-2.020	0.504	16.066	1.000	0.000	0.133	0.049	0.356
Constant	-5.632	1.171	23.143	1.000	0.000	0.004	-	-

Source: Own calculation.

NONFARM, GETJOB and WELFARE appeared as the significant prediction of demand on migration. This can be explained as the following.

Personal factors

Educational level: The result indicates a positive relationship between education and migration. β_1 is the coefficient of EDU variable. It means that if a Cambodian migrant has an increase in education one level, it will lead to an increase in log (Odds) to 1.4498 unit, which will lead Exp (B) > 0. The increase in odds ratio means the opportunity of the interesting situation will occur. Thus, the education of Cambodian migrant increases one level, it will lead to odds ratio increase or the opportunity to migrate will increase as well.

Factors related to country of origin

Difficulties in finding work at home country: One of the push migration factors is the difficulty of finding work at the home country. The coefficient of DIFFICULT variable is explained by β_2. As the Cambodian migrants encounter more difficulties of finding work at home 1 unit log (Odds) will increase to 1.2151 unit, and the Exp (B) > 0. An increase in odds means the migration opportunity will also increase. From this perspective, the migrants who face the difficulties of finding work at home country have more tendencies to migrate than those who do not experience any difficulties.

Welfare and public utilities at home country: In accordance with their importance, welfare and public utilities at home country (WELFARE) have the highest statistically significant effect on demand on migration. It implies that if the welfare and public utilities at Cambodia are developed, Cambodian migrants may have low chance to leave abroad.

Factors related to destination country

Working on non farm sector at destination country: NONFARM is the second important significant factor in the migration model. The estimated coefficient is positive, which indicates that getting non farm work in the destination country is as a pull factor, motivating worker to migrate. In this sense, people who work on non farm work are more likely to earn higher income than farm work.

Having a work position at destination country: Having

Table 14. Classification table of determinants of Laotian migrants demand on migration.

Observed		Predicted demand to migrate in the future		Percentage correct
		Yes	No	
Demand on migration	Yes	80	8	90.9
	No	13	49	79.0
Overall percentage				86.0

Constant is included in the model. The cut value is 0.5.
Source: Own calculation.

Table 15. Variables in the equation of determinant of Laotian migrants demand on migration.

Variable	β_i	S.E.	Wald	df	Sig	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
STATUS	-1.405	0.557	6.354	1.000	0.012	0.245	0.082	0.732
EMPLOYRT	-0.054	0.011	22.681	1.000	0.000	0.948	0.927	0.969
ATTITUDE	-1.029	0.318	10.478	1.000	0.001	0.358	0.192	0.667
OWNHOUSE	-2.303	0.646	12.707	1.000	0.000	0.100	0.028	0.355
FAMMEMB	1.336	0.280	22.710	1.000	0.000	3.804	2.196	6.590
Constant	7.628	1.822	17.526	1.000	0.000	2055.220	-	-

Source: Own calculation.

a work position at destination country (GETJOB) is a highly significant variable for demand on migration. The increase in odds ratio is as a result of an increase in migration opportunity in the future. In consequence, if workers are expecting that migration will definitely make a job, they will certainly migrate.

Determinants of Laotian migrants demand on migration

Table 14 illustrates the result of the reliability examination of logistic regression equation. The test of the suitable of the model is done by comparing the predicted value and the observed value by the cut value of 0.5. If $\widehat{P}\,(Demand\ on\ Migration) \leq 0.5, \text{there}$ will be an increase in labor's demand on migration. If $\widehat{P}\,(Non\ Demand\ on\ Migration) > 0.5,$ there will be a decrease in labor's demand on migration. Observed data are 88 of total labors having the demand on migration. After applying migration equation, it can be predicted that 80 migrants have demand on migration. Hence, the prediction is correct at 90.9% ((80/88) × 100 = 90.9%). In contrast, the observed data of 62 people do not have demand on migration. When the prediction is done by applying migration equation, it can be predicted that 49 people have no demand on migration. The prediction is correcting at 79% ((49/62) ×100 = 79%). The total percentage of forecasting is as accurate as 86% ((80 + 49)/(88 + 62) × 100 = 86%). The total percentage of forecasting is as inaccurate as 14% ((13 + 8)/ (88 + 62) × 100 = 14%). According to the 150 observed samples, the logistic regression equation can predict 129 samples. The percentage of predicting is correct, accounting for 86%.

According to Table 15, columns 4 and 6 present the Wald test statistics and significance value of test results. The assumption is as follow:

$$H_0 : \beta_i = 0\ ;\ \ i = 0, 1, \ldots., 5$$
$$H_1 : \beta_i \neq 0\ ;\ \ i = 0, 1, \ldots., 5$$

The Wald test statistics has a Chi-square distribution. All the coefficients of the variables are not zero ($\beta_1 \neq 0\ ;\ \beta_2 \neq 0, \beta_3 \neq 0,\ \beta_4 \neq 0,\ \beta_5 \neq 0$). Concerning the Sig. of test, it shows that Sig. is equal 0.0000. The Sig. of STATUS, EMPLOYRT, ATTITUDE, OWNHOUSE and FAMMEMB variables equal 0.0117, 0.0000, 0.0012, 0.0004 and 0.0000, respectively, which are less than 0.05. That is rejecting null hypothesis (H_0) at the 95% confidence level. It indicates that those variables have influence on migration decisions.

In the case of large coefficients (β), the standard error (SE) is also great. It will cause the Wald test statistic to be low, causing the inability to reject the null hypothesis

whereas it should be rejected. Therefore, the test results should not be summarized by considering only Wald values but should create a model with variables that need to test the coefficients with models that do not have variables to test coefficients, and considering the changing log-likelihood value. Meaning Exp (B) or $e^{\beta} = e^{\beta i}; i = 1, 2, \ldots, 5,$ with the coefficients of $\beta_1, \beta_2, \ldots, \beta_5$. Considering the odds value as:

$$\text{Odds} = \frac{\hat{P}\ (\text{Migration})}{\hat{P}\,(\text{Not Migration})}$$

$$= e^{b_0 + b_1 \text{INCOMEt} - 1 + \cdots + b_6 GETJOB}$$

It can be divided into 3 cases. If $\beta_i > 0$, it will lead to $e^{bi} > 1.$ Odds value will increase or opportunity to migrate will increase. If $\beta_i < 0,$ it will lead $e^{bi} < 1.$ Odds value will decrease or opportunity to migrate will decrease. If $\beta_i = 0$, it will lead $e^{bi} = 1.$ Odds value will not increase or decrease, so the opportunity to migrate will increase or decrease. For example, Exp(B) of FAMMEMB variable is equal 1.3360, which is more than one. It can be explained that if number of family member living in Thailand (FAMMEMB) increase 1 person, the odds ratio will increase or opportunity to migrate in the future will increase.

Refer to the last column, 95% CI for Exp(B) is the estimation range of Exp(B) at 95% of confidence level. For instance,

$2.1958 \leq Exp(B) \leq 6.5899$ or $P\,(2.1958 \leq Odds\ of\ FAMMEMB \leq 6.5899) = 0.95.$

The minimum value is greater than one or the value one is the value in the range value. It is possible to conclude from this set of data that changes in the number of members of households living in Thailand are associated with changes in the odd ratio.

$$MIGRAT_{LAO} = 7.6281 - 1.4048\ STATUS - 0.0535\ EMPLOYRT - 1.0285\ ATTITUDE - 2.3029\ OWNHOUSE + 1.3360\ FAMMEMB + \varepsilon_i \quad (6)$$

where $MIGRAT_{LAO}$ is demand on migration of Laotian migrants, STATUS is marital status (single), EMPLOYRT is ratio of employed family worker to total family members, ATTITUDE is knowledge and attitude toward Thailand, OWNHOUSE is having own house at home country, FAMMEMB is number of family member living in Thailand, and ε_i is random error term.

The result of the test of proportional odds assumption can be applied to test the appropriateness of logit estimation. The odd ratio represents the ratio of the probability to occur of an event to the probability of non-events. The parameters $(\beta_1, \ldots, \beta_n)$ give the variation of the odd ratio's logarithm at x_k's factor increasing with 1 unit. Countries of origin and destination factors do not fully affect the migration phenomenon. Demands on migration of Laotian migrants are influenced only by personal factors. The interpretation of the output is described in the following statement.

Personal factors

Marital status (Single): Coefficient (β_1) is equal to -1.4048. It is the coefficient of STATUS variable, meaning the increase of a single marital status migrant, it ends up with the decrease in the log (Odds) value or demand on migration. The probability of being a migrant among singles and others is insignificant towards the single ones. The people leaving from Laos are more likely to be the married one.

Ratio of employed family worker to total family members: The output shows up that the logistic coefficient of β_2 is -0.0535. If the ratio of employed worker in family increases (one person), log (Odds) will reduce or demand on migration will decline. The ones with high ratio of employed family workers to total working family member migrate the least of all.

Knowledge and attitude toward destination country: The coefficient of ATTITUDE is -1.0285. If the Laotian migrant have more knowledge and better attitude toward Thailand, it leads to log (Odds) value decline or demand on migration in the future will slow down. The data available from the output show that most people who have demand on migration are the ones having less knowledge toward destination country.

Having own house at home country: Having a house at the home country variable (OWNHOUSE) has the negative relationship to the demand on migration with coefficient of -2.3029. The reference group for the house owning variable is the one who have house at home country. Hence, the people who have their own house at the home country, have less chances to leave abroad than the ones without own house.

Number of family members living in the destination country: One of the strongest associations of the model is observed in relation to the FAMMEMB variable (β_5= +1.3360). If there is an increase in the number of family members who live in Thailand (one person), the log (Odds) will increase or demand on migration will increase. Family members who are absent from home for a longer period to live in destination country, may hasten

Table 16. Conclusion of the consistent of the direction of independent and dependent variables of the model and assumption of each model.

Parameter	ASS	Analytical result									
		Full model		Fitted variables (Sig.<0.05)		Burmese migrant model (Sig.<0.05)		Cambodian migrant model (Sig.<0.05)		Laotian migrant model (Sig.<0.05)	
		β_i	Sign	β_i	Sign	β_i	Sign	β_i	Sign	β_i	Sign
Personal factor											
SEX	+	-0.043	-								
AGE	-	0.009	+								
EDU	+	0.094	+					1.449	+		
DEBT	+	0.000	+								
STATUS	+	-0.510	-							-1.405	-
UNEMPLOY	+	0.117	+			0.848	+				
$INCOME_{t-1}$	-	0.000	+	0.000*	+	0.000	+				
INCOME	+	0.000	+								
EMPLOYRT	-	-0.006	-							-0.054	-
ATTITUDE	-	-0.613	-	-0.617*	-					-1.029	-
OWNHOUSE	-	-0.803	-	-0.798*	-					-2.303	-
FAMMEMB	+	0.283	+	0.362*	+					1.336	+
Factors related to country of origin											
DIFFICULT	+	0.806	+	1.012*	+			1.215	+		
$UNEMPLOY_{t-1}$	+	0.055	+								
DRYWEAT	+	1.930	+								
POOR	+	0.408	+			1.539	+				
LOWINCOM	+	0.619	+								
POLITIC	+	0.435	+								
OPPORTU	-	-0.196	-	-0.213*	-	-0.316	-				
WELFARE	-	-0.483	-					-2.02	-		
Factors related to destination country											
DISTANCE	+										
DIFINCOM	+										
POPDENS	+	0.009	+								
AREA	+										
NONFARM	+	0.770	+					1.919	+		
GETJOB	+	0.424	+					1.826	+		
CONSTANT		0.657	+	1.827*	+	-0.1043	-	-5.632	-	7.628	+

ASS stands for assumption. β_i is beta coefficient. *Significant at 0.05. Sign is the relationship direction of independent and dependent variables.

hits a bottom. Economic growth is expected to be the third economic factor**.** Thailand's GDP per capita is the highest among these countries. Other factors are geography and country's development. Since Thailand, Myanmar, Cambodia and Laos are located nearby; it is also the main motives of migration. Finally, human development index (HDI) plays a great role as well. Thailand's HDI ranking 83th refers to high human development group, follow by Lao PDR, Cambodia and Myanmar.

In this study, it is observed that migrants whose age is 30, more likely to be women and considerably graduate primary education. The analysis shows that the migrants are more likely to be married and be employed. An increase of relative income of a migrant compared to prior migration by 235% (from 2,850 Baht per month to 9,554 Baht per month). The ratio of working family member to total family member is 75%. The majority of them do not have own house at home country. The significant influence of the number of family member living abroad is important for migration analysis. Most migrants have an average of three persons in their family living aboard. They mostly had background about the difficulties to find work at home country.

Based on this study, demand on migration is classified by nationality, Burmese, Cambodian and Laotian. Demand on migration of Burmese migrants is relevant to four factors, two related to personal factors (employment and past income), and two related to country of origin (poverty and opportunity of career at home). While it reaches to five factors which correlate to the demand on migration of Cambodian migrants separating in three components, that are, personal factor (educational level), country of origin factors (difficulties of finding work and welfare at home), and destination factors (non-farm employment and opportunity to get work). Finally, there is only the personal factor that plays an important role on the demand for migration of Laotian people. These are the status of marriage, employment, attitude, having own house and having family member in destination (Table 16).

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Trend analysis and economic effect of RTA deaths on dependency ratio in Ghana

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Road traffic accident (RTA) injuries and mortalities are some side effects of using automobile vehicles and Ghana is not deprived of them. This study enlightens some effects of road traffic accident mortalities on the Ghanaian economy and investigates its yearly trend, age range distribution and also reveals its influence on economic activities. 832 secondary data obtained on individuals who died through RTA from the Autopsy day book of Pathology Unit, KATH was studied. 15% (126) of the victims were children below 15 years (≤14), 9% (78) are aged over 64 (≥65) years. The total RTA deaths among these two economic dependent age range (≤14 + ≥65) was 25% (204) and that of the economic active population (15-64) is 75%(628). Yearly trend plot shows fluctuations as the working group lies above the dependent population. There is 3:1 death ratio between the economic independent and dependent population respectively, contributing to high dependency ratio in Ghana. Support from the working group towards their families, society and any other dependent population decreases. Economic growth, development and GDP are negatively affected as tax revenue and productivity is comparatively decreasing. The Motor Transport and Traffic Unit should increase its effort to ensure discipline on roads.

Key words: Road traffic accident, active/working population, dependency ratio, mortality, economy.

INTRODUCTION

Collision of vehicles against each other and other objects on motorways and roads has been one of the leading causes of deaths and loss of resources. These various forms of road traffic accidents affect individuals and societies all over the world (Coleman, 2014). Some of the indicators contributing to most RTAs in Ghana include indiscipline behaviors of road users (drivers on phone, pedestrians crossing road at wrong places), poor road network (Amedorme and Nsoh, 2016), driving under the influence of alcohol and bad vehicle conditions (Coleman, 2014). Having unlicensed and minors driving on our roads, drivers driving long distance without rest and chronically-ill (visually impaired) drivers are factors contributing to road traffic accidents. Over 65% of

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Abbreviations: RTA, Road Traffic Accident; **MTTU,** Motor Transport and Traffic Unit; **GNI,** Gross National Income; **NRSS,** National Road Safety Strategy.

vehicles involved in accidents result from over-speeding (Hejase et al., 2017) and drivers failure to obey traffic signals (Ansari et al., 2000). As road traffic accident cases are predicted to increase to 80% in low and middle income countries (Orowhigo and Planning, 2017; Ossei et al., 2017), it is also seen to be pronounced much more among the economic working force or active adults (Oppong, 2012; Afukaar et al., 2003; Yunusa et al., 2014). RTA is not limited to the immediate known problems of losing lives and properties but extends to influence some economic factors like working hours of a victim and their relatives, high dependence on relative's income, increase in government expenditure on emergency and medical cost, and loss of wages and productivity (Gorea, 2016). Despite government contribution to availing facilities and equipment for health services delivery, patients medical bills in Ghana according to Afukaar et al. (2003) were estimated between $128.75 and $328.85, and $43.22 and $85.40 per urban area transport-related injury and rural area transport-related injury respectively, affecting Ghana's gross national income (GNI) (Afukaar et al., 2003). The country's human resources are affected as domestic production decreases.

Economic factors like savings is affected as medical payments become a shared responsibility of patient and their family (Afukaar et al., 2003). The country also faces decline in its labor force as some RTA victims become morbid. Even though road traffic accident is an occupational hazard, Ghana over the years has strengthened systems and initiated activities like National Road Safety Strategy (NRSS) I, II, and III to ensure road safety. The 2016 report from Ghana national road safety commission informs comparatively to 2015, an increase of 15.6% accidents but decrease in deaths (National Road Safety Commission, 2016). Economic total dependency ratio is grossly the match of individuals not working to those in the labor force. A low dependency ratio indicates greater number of working population over the dependent population. When people working are of high number to support the non-working population with their needs, it reduces government expenditure on some social amenities (Amadeo, 2019). The economic dependency ratio considers three age distribution; those below age 15, those from age 15 to 64, and those above age 64. Those of the age ranges below 15 and above 64 are grouped and considered as the dependent population while the individuals from the age 15 to 64 is related to as the active or working population. A total economic dependency ratio is greatly influenced by many factors which include road traffic accidents injuries and fatalities.

The population size of the economic dependency distribution, the dependent or non-working population and active population or labor force is greatly affected by RTA deaths. 90% of RTA occurs in low and middle income countries and they lose about 3% of their gross domestic product (Ivers et al., 2017). Economic development is examined to have a positive relationship with the growing number of traffic-related deaths, but it is also seems to stimulate adaptation mechanisms, such as improvements in the traffic infrastructure and trauma care (Van et al., 2000).

DATA AND METHODS

A secondary data sample of 832 RTAs death cases from Komfo Anokye Teaching Hospital, Pathology Unit Autopsy day book was extracted to examine the objective of this study. The hospital serves the Ashanti region which contributed about 19.3% of the Ghana's total RTA fatalities in 2016, and it is the highest (National Road Safety Commission, 2016). The hospital hence has information on most of the RTA death cases in the region as it is the major referral hospital for most emergency cases. Only data with the following variables; age of the victims, gender, nationality (Ghanaian) and having underling cause of death as RTA were extracted for this study. Data were compiled with Microsoft excel 2013 and analyzed using the statistical analysis software, SPSS (SPSS v22) and Microsoft excel 2013. Time series plot and analysis, percentage, ratio and proportion are some of the analysis tools employed to achieve the objectives of the study.

RESULTS

General distribution

The mean age for the total number of deaths studied is 36 years. The modal age is 30, with 40 frequencies. The youngest age is 0.3 year (15 weeks) and the oldest is 97 years. About 60% of the victims died as passengers, followed by 31% who died as pedestrians. From the autopsy day book, the most underlying cause of death was hemorrhagic shock which results from injuries victims obtained during the accidents. More than half of the people suffered from head, chest and abdominal injuries which accounted for loss of blood, leading to the above stated underlying causes of death.

Age and gender distribution

A total RTA death cases of 832 was studied by eight different age ranges. Road traffic accident death is much mentioned among the following age ranges: 30-39 (21.75%), 20-29 (20.19%), and 40-49 (13.94%), respectively. However, the aged individuals' engagement in road accident is less seen as the studied age range of 60-69 formed 6.25%, and the aged above 69 years formed 6.85% of the total 832 RTA deaths. The total deaths among age ranges below 20 accounted for 163 (19.59%), which is proportionately about one-fifth of the total death cases studied. These are summarized in Table 1. Other results from the study show that the gender distribution of victims of road traffic accidents is as follows: 72.6% (604) are men while the women fatality number is 27.4% (227).

Table 1. Age Distribution of RTAs.

Age Range	Frequency	Percentage
≤9	86	10.34
10-19	77	9.25
20-29	168	20.19
30-39	181	21.75
40-49	116	13.94
50-59	95	11.42
60-69	52	6.25
≥70	57	6.85
Total	**832**	**100.00**

Table 2. Economic dependency ratio age distribution.

Age range	Frequency	Percentage
≤14	126	15.14
15-64	628	75.48
≥65	78	9.38
Total	**832**	**100.00**

Economic dependency age categorization

75.48% of the RTA death victims are of the economic working population, thus 15 to 64 years. Children below 15 years contribute 15.14% and those above 64 years amount to 9.38%. Table 2 gives a summary. Moreover, results show that 75.48% represent RTA deaths in the economic active or working population. 25.52% represent RTA deaths in the dependent population, which is the total portion of deaths for the two economic dependent population (≤14 and ≥65).

Yearly trend analysis

A yearly trend plot of the three economic age distribution shows fluctuation in the number of RTA deaths mentioned within the age groups; below 15, between 14 and 65, and above 64 years for the period 2010 to 2016. From Figure 1 which summarizes the trend plots, the trend graph for economic working group is shown in blue. It has a frequency of 115 in 2010, but massively increased in 2011 to 158. The number of deaths in 2012 significantly decreased below 80 and remained quite stagnant in 2013. In 2014, RTA deaths among the working force increased to 100 and later fell below 60 in 2015. It kept a slight trail in 2016. The dependent age group below 15 years is presented in green and the aged group is presented in red. Both have the maximum points not above 40. The number of RTA deaths among the children age group below 15 years reached its peak in 2011 at 40 and eventually fell below 20 in 2012. It slightly decreased in 2013 and later increased to 20 in 2014. It again dropped in 2015 and rose back to 20 in 2016. The number of deaths among the aged group (≥65) looks to always lie below and follow a trend of the children below 15 years except in 2015 where both trends intersect. The yearly total of RTA deaths presented in orange shows a decreasing trend after the drastic rise in 2011 total cases. It has been sustained below 150 since the significant fall in 2012. Generally, the number of deaths mentioned in the working population lies far above the two dependent populations. Number of RTA deaths among the active working group seems to be decreasing over the years despite the fluctuations. The total frequency of RTA deaths seems to be decreasing over the years, assuring more decrease in the future.

DISCUSSION

Total life expectancy in Ghana is 63.4 according to the latest WHO data published in 2018. Life expectancy for Male 62.5 years, and females is 64.4 years which gives Ghana a World Life Expectancy ranking of 155 (WHO, 2018). With the country's life expectancy study, road traffic accidents are found to be one of the leading causes of unnatural deaths in Ghana. An earlier study on "trend of medicolegal manner of deaths in Ghana" shows similar findings (Ossei and Agyeman-Duah, 2017). Out of the 832 studied RTA death cases, men are seen to be more affected than women with an approximate ratio of 3:1. Other studies stated similar results on men to women RTA death ratio (Ivers et al., 2017; Peden, 2007; Hassan, 2018; Wong et al., 2002; Jha et al., 2003). Men are more seen on the road with sociocultural reasons and high tendency of taking risk (Peden, 2007). A study by the United Nations also has shown that RTA is one of the leading causes of death among children (Ivers et al., 2017). Deaths among children (below 10) by RTA accounted for about 10% of the total RTA deaths in this study. About 50% of children dying on roads are killed as passengers (Ivers et al., 2017). The remaining proportion is shared among being a pedestrian, and other forms of road users. About two thirds of the global road traffic injury deaths among children occur in places including Africa (WHO, 2008). Even though the International Monetary Fund (IMF) placed embargo on white collar jobs in the country, the World Bank's report on Ghana's labor force participation indicate an average value of 67.48% in 2018 and is the highest ever (The Global Economy, 2018). This informs that higher proportion of the active labor force is being employed in the private sector and the country's National Employment report affirms that (Anthony et al., 2015). 2015 labor force report from the Ghana Statistical Service shows that 3% of the country's labor force is commercial drivers. The private sector which is characterized by bad working conditions, uncertain work relationships and low wages still employs 80% of Ghana's labor force (Osei-Boateng and

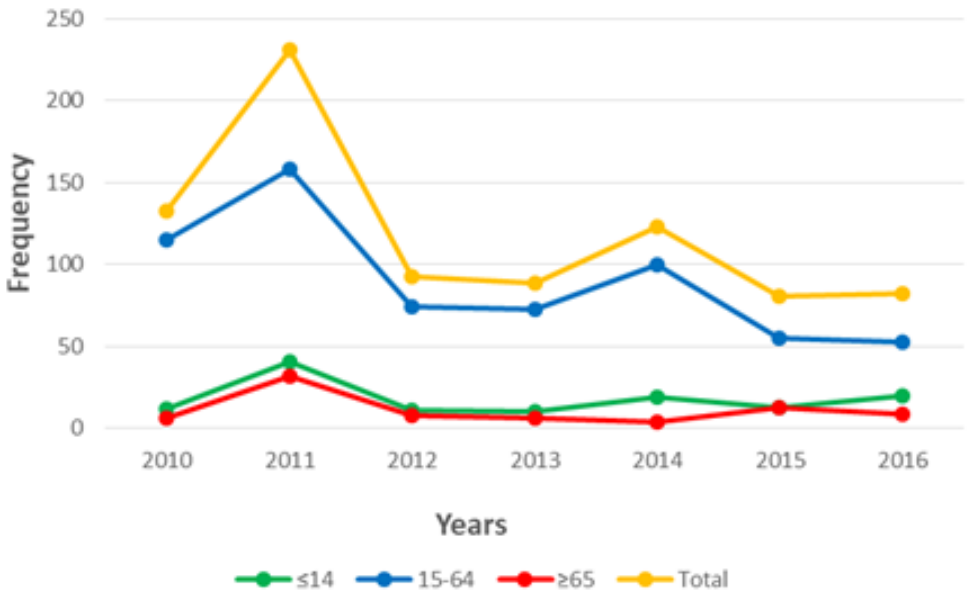

Figure 1. Yearly trend plot of economic dependency ratio age distribution.

Ampratwum, 2011). Male and female within the same working age of 15 to 60 years have 0.3/0.2 probability of dying, respectively (WHO, 2018), but income level, education level, age and occupation type have been studied to be the most influential factor for them to decide on the type of transport mode to patronize. Similar studies reveal that “trotro” (commercial vehicle) is the main transport mode of choice in Ghana (Hotor, 2016; Nantulya, 2002).

Deaths on the road among the age ranges 30-39, 20-29 and 40-49 in this study were very high. The aforementioned stated age groups recorded the highest frequencies of 181, 168, and 116, respectively. Related studies and other studies report similar findings about these age groups in relation to death on the road (Ossei et al., 2017; Peden, 2007; Hassan, 2018; Wong et al., 2002; Jha et al., 2003). Road traffic accidents mostly kill the economic working population. A high proportion of road traffic accident victims are the bread winners of their households. They are the economic active workers in their families (Nantulya, 2002). A study by the Center for Disease Control and Prevention on motor vehicle safety reveals that, in 2016, 2,433 young adult in the United State died on the road. Most developing countries, especially in Africa with relatively low vehicle densities are experiencing higher fatality rates than most industrialized countries. Relative countries like Nigeria and Kenya observed a five-fold increase in traffic-related fatalities over the last 30 years (Odero, Garner, and Zwi, 1997). Developing countries account for 48% of motorized vehicles but contribute almost 90% of its fatalities (Schmucker et al., 2010).

A seven-year yearly trend viewed in respect of the three dependency ratio age groups in this paper shows that deaths on the road have been decreasing over the years. Among the working population, it decreases slowly with some fluctuations. A report from the Ghana transport commission on RTA shows that, accidents on the roads over the years are increasing but its mortality rate is decreasing (National Road Safety Commission, 2016).

Reference to some governmental intervention program like the Traffic System Risk (TSR) index and road safety campaigns has played significant roles in reducing deaths on the road (National Road Safety Commission, 2016). Comparatively to other developing countries, rapid motorization, poor traffic management system and bad road network contribute to the disproportionate number of road traffic accidents (Nantulya, 2002). The existence of unauthorized speed ramps, high speed motor traffic at pedestrian traffic like schools, bus stops, parks among other hinders accident avoidance (Vasconcellos, 2005). This study reveals that deaths on the road among the economic active or working population are very high. It is three-fold that of the two non-economic active populations put together. Most of the non-economic active people comparatively patronize our transport system at a low rate (Peden, 2007). Their less engagement in economic activities relatively keeps them away from the road than those of the working group (Peden, 2007). As individuals of the economic working population die 3-times more than those in the dependent populations, it affects the country’s economy and result in high total dependency ratio (Amadeo, 2019). In 2016, an estimate of 13.6 billion dollars was spent by the United States on issues of motor vehicle accidents, influencing government expenditure. The effect of RTA death ratio between the economic

active and dependent population is not appreciable to economic dependency. Once the number of people in the working force decreases more than those in the economic dependent population, it causes an increment in the number of economic dependents (Amadeo, 2019). This put more financial stress on the remaining working population. The working group has a greater responsibility of paying tax and their absence by death on the road influences the country's revenue mobilization. High dependency ratio relatively affects government expenditure especially on providing infrastructures for the dependent population. The decrease in the number of high taxpayers group will call for high taxes and government borrowing (Razin et al., 2014). Dependency ratios are statistically significant and quantitatively important influencer of aggregate saving ratios. High dependency ratios among other important factors account for the great disparity between developed and underdeveloped countries (Ram, 1982). Deaths on the road affect GDP, economic growth and development. Diminish in productivity, loss of production hours of victims and their relatives, medical cost, and premature mortality among others hinder economic growth (Sachs and Malaney, 2002). Some studies have shown that, countries that fail to invest in road safety lose about 7 to 24% of their per capita GDP (Ivers et al., 2017). Reducing road traffic accident can boost economic growth. Earlier study on deaths and economic indicators estimates that, 10% reduction in road traffic deaths raises per capita real GDP by 3.6% on the average. Improving road safety intervention will not only benefit the society but in the macro economy, it will save huge economic tolls and human potentials. Limiting road traffic injuries and deaths plays a significant role in global development, with many benefits for public health, wellbeing, and economic growth (Ivers et al., 2017).

Conclusion

The economic dependency ratio in Ghana is influenced by deaths on the road. The country faces the issue of labor force declining as RTA injuries render its victims incapacitated. RTA over the years is increasing but its mortality is decreasing. Deaths on the road among men are three times more than that for women. Men engage more in vehicular activities than the women and have high tendency of taking risk on the roads. Yearly trend analysis shows that RTA deaths are generally decreasing but it is much seen among economic working force than the dependent population. The death ratio of 3:1 among the economic independent and dependent population respectively influences total dependency ratio to be high in the country. Losing high numbers of taxpayers through RTA diminishes productivity and economic development. The country's savings rate is influenced as victims of RTA burden their relatives with medical bills and loss of economic working hours. The country's economic growth and development are affected as more human potentials are lost due to the deaths on the roads. Despite the Ghana government road safety interventions like Traffic System Risk (TSR) index and other road safety campaign activities which are positively influencing the number of deaths on the road (National Road Safety Commission, 2016), more interventions like double lane road and good traffic light system should be built to enhance the road transport system. Regular public education on road safety measures should be organized. Driving when tired or drunk should be discouraged. The Motor Transport and Traffic Unit (MTTU) should increase its force to ensure discipline on roads.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests

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