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Study on Structure of Population Divided by Gender and Geography: HCM, Vietnam Case

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ABSTRACT

Population is one crucial factor to develop an economy, but how to divide the population by gender and geography efficiently requires excellent strategy. The objective of this paper is to assess the impact of population structure divided by gender and geography in terms of Vietnam as a country based on logistics transport development in Ho Chi Minh (HCM), Vietnam by using multivariate regression with time series data between 2010 and 2019. The major findings are resident population in rural and urban settlements were impacted, but female and male populations were not impacted based on productivity calculated from the labour of Logistics Transport Industry (LTI). Rural and in urban resident populations were not impacted but female and male populations were impacted by passengers' productivity based on calculations obtained from LTI. While female and male populations were affected, all rural and urban resident population were not affected by Gross domestic products.

Keywords: labour force; logistics; transport; HCM; Vietnam

INTRODUCTION

There is a close correlation between population and development, as both are bound, supported and promoted by each other. In order to grow and develop socio-economically, human resources are associated with population change in both quantity and quality. At the same time, population change also promotes human resource development. All socio-economic activities affect every group of people. Population size, population structure, population distribution and population quality have an influence on socio-economic development in the present and in the future. A suitable population will stimulate rapid and sustainable development, improve the people's physical and spiritual life, and enhance the potential of the productive force. Appropriate population growth is the basic factor to reduce unemployment. In any countries, socio-economic development policies, strategies and plans must attach with the population factor and make the population factor the driving force of economic development.

In terms of population growth in all fields especially economics sector reflects on the sustainability of life systems on earth. However, the future is not the number of people but what people will do in their everyday life which could impact the life systems surrounding them and how equipped they will be to face emerging challenges. The challenges exist, and in the coming decades, particularly in less developed and developing countries (Anne, 2019). Population dynamics influence development on economy and vice versa, at various levels, i.e. globally, continentally, regionally, nationally, and locally. Population dynamics and economic development have quite different governance implications in different parts of the world (Marco, 2020).

According to Petra Marešová et al., (2015), "The share of the population aged 60 and over is projected to increase in nearly every country in the world during 2015-2080. Population ageing will tend to lower both labour-force participation and savings rates, thereby raising concerns about a future slowing of economic growth".

The objective of this study is to measure the impact of structure of population divided by gender and geography on logistics transport industry and how they impact HCM, Vietnam.

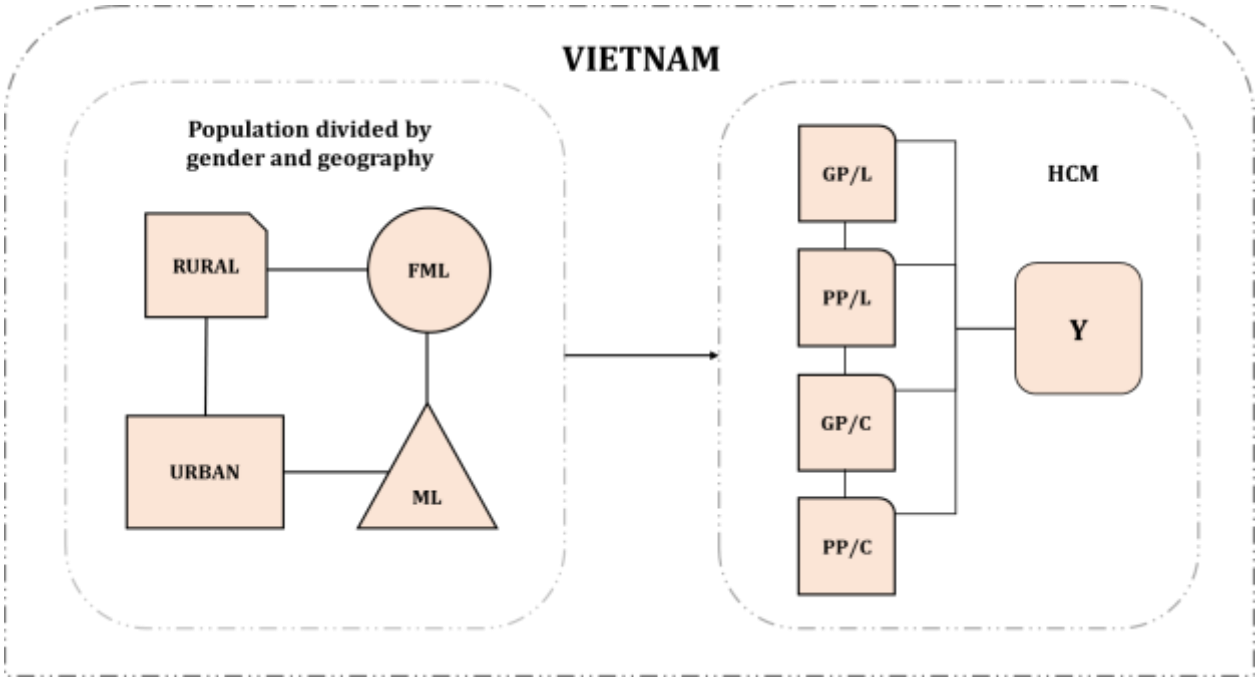
LITERATURE REVIEW

[1] Philipp et al. (2016) supposed that "Senior citizens tend to discount future payoffs more heavily than working-age individuals, a negative and significant effect of population aging on public investment". [2] Labour productivity depends on ages of population (Leon et al., 2006). [3] The fiscal gap, demographic change, the effect of the aging population, support from government have relation. There is a strong trade-off between efficient economy and social equity in United State of America (Shinichi et al., 2015). [4] There are significant differences between the municipalities in the circular economy index and its sub-components which are mainly attributed to their regional location, population size, density, industrial concentration and investment programs in the circular economy's infrastructure (Almas et al., 2021). [5] The population distribution impacts on economy, and the household sector is considered as a distinct decision-making unit such that the consumption expenditures on goods and on goods and services by various income classes is dependent upon its income and prices.

The prices and incomes on the gross output and primary input requirements and on the income generation/distribution of the economy of United State of America (Kusum, 1983). [6] Gross domestic product density and the variable of population density are related to analyse the associations with the road networks (Xisheng et al., 2018). [7] In the context of rapid urbanization in China, there is conflict between urban population, economy, space, and environment that are intensified and complicated. The integrated development of urban population, economic, space, and the static coordination degree of urban integrated development and environment showed obvious periodical and fluctuant characteristics (Zhang et al., 2008). [8] According to Conglin et al. (2015) that "The spatial dynamic distributions of the population, economy and water resources was large. The gravity centre of economy and per capita average annual total water resources moved westward, while the gravity centre of population gravity centre moved eastward in the period of 1997–2011 in Northeast China. It must be noted that, the migration trend of the economy gravity centre was more significant than those of the population and water resources". [9] Economic growth and increasing population promote the demand for energy in developing economies globally and also in South Asia. There is no long-term relationship between electricity consumption and economic output for Nepal, distinguishing it at the regional level for South Asia. However, a 1% increase in population increases electricity consumption by 4.16% in the long-term (Rabindra et al., 2019). [10] The population and population growth have relation makes increase in carbon dioxide (CO_2) emissions. And there is impact of Gross Domestic Product (GDP), population growth and the generation of renewable energies on CO2 emissions in the 50 largest world economies over the years 1990–2015 (Anny et al., 2020). [11] Rebecca Hall (2020) reported that "A move from the welfare-state era, wherein the state structured northern Indigenous “dependency”, to the neoliberal era, wherein dependency became a problem to be solved through increased indigenous incorporation into capitalist wage labour. The northern diamond mining industry, responding to both indigenous demands for land recognition and neoliberal imperatives for lean operations, exemplifies this latter approach". [12] From a national scale, when the population structure changes, structural mutation points in different regions are heterogeneous. When the economic structure and resource structure change, the value of the negative non-linear coefficient between urbanization change and water consumption becomes larger. When the population structure changes, the negative non-linear correlation between urbanization changes and water consumption shows a "U"-shaped change (Qiang et al., 2021). [13] When the density of population decreases and the competitive population density remains stable, it has implications on the platform economy (Jin et al., 2021). [14] Xueting et al., (2021) stated that "The compatibility of resource-environment consumption per unit employed population, which can reflect the current equal or compatible levels between socioeconomic development. Population employment structure based on industrial transformation, resource-deficit, excessive emission and economic viability'". [15] The effects of low fertility, low mortality is very different in direction and impact by age group on the economy of South Korea. The only effect of an aging population that is the same in all circumstances (Hyun et al., 2021).

METHODOLOGY

- **Study framework**



Study framework's Variables

• Independent variables

RURAL is population of Vietnamese who are resident in Rural areas, unit is a thousand people.

URBAN is population of Vietnamese who are resident in Urban areas, unit is a thousand people.

FML is population of the Vietnamese who are Female, unit is a thousand people.

ML is population of Vietnamese who are Male, unit is a thousand people.

• Dependent variables

GP/L is productivity of cargo which is calculated based on labour of logistics transport industry (LTI), the unit is thousand tons / total labour of LTI.

$$GP/L = \frac{\text{Total cargo volume in LTI that have been transported}}{\text{Total labour force in LTI}}$$

PP/L is productivity of passenger which is calculated based on labour of LTI, the unit is million passenger / total labour of LTI.

$$PP/L = \frac{\text{Total number of passenger in LTI whoc have been transported}}{\text{Total labour force in LTI}}$$

GP/C is productivity of cargo which is calculated based on labour of LTI, the unit is thousand tons / total capital of LTI.

$$GP/C = \frac{\text{Total volume of cargo in LTI which have been transported}}{\text{Total capital in LTI}}$$

PP/C is productivity of passenger which is calculated based on labour of LTI, the unit is million passenger / total capital of LTI.

$$PP/C = \frac{\text{Total number of passenger inn LTI who have been transported}}{\text{Total capital in LTI}}$$

Y is Gross domestic products.

Multivariate regression model (MR)

$$GP/L = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML + i \quad [1]$$
$$PP/L = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML + i \quad [2]$$
$$GP/C = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML + i \quad [3]$$
$$PP/C = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML + i \quad [4]$$
$$Y = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML + i \quad [5]$$

Where

z_o is the intersection of vertical axis and lines of regression.

i is other variables that are not RURAL, URBAN, FML, ML which this paper does not analyse.

As per Keshab (2015, p. 55) and Jeffrey (2020, p. 126), whereby;

$z_o + z_1 + z_2 + z_3 + z_4 = 0$ is to show that MR models [1], [2], [3], [4], [5] are built not to be suitable to the input data, so there is no statistics significance.

$z_o + z_1 + z_2 + z_3 + z_4 \neq 0$ is to show that MR models [1], [2], [3], [4], [5] are built to be suitable to the input data, so there is statistics significance.

$z_1, z_2, z_3, z_4 > 0$ means that RURAL, URBAN, FML, ML impact on GP/L, PP/L, GP/C, PP/C, Y, respectively and separately.

$z_1, z_2, z_3, z_4 <= 0$ means that RURAL, URBAN, FML, ML do not impact on GP/L, PP/L, GP/C, PP/C, Y, respectively and separately.

1.

2. THEORETICAL BASIS

Logistics transportation

The development of logistics transport sector is complicated by the difficult climatic, geological-political, socio-economic conditions of the region. It requires an integrated transport and logistics model that combines the issues of supply, delivery and rotation of personnel in the places of work on hydrocarbon fields, as well as the optimal operation of transit routes (Vitaly et al., 2021). The logistics transport sector is the need of the overall economy. While transport challenges have some peculiarities to some countries, there are general statements that can be made which describe many economies in the African continent leading to some structural defects that are pervasive challenges of transportation system in the continent in comparison to several other countries in Europe, Asia and South America (Oyesiku et al., 2020). Today, logistics transport is not only distribution and transportation logistics but also it has become an important part in strategic planning of business organizations that is a crucial part of organisations' success (Natalia et al., 2021).

3. DATA SOURCE

Time series data from 2010 and 2020 are from HCM Statistics Office and HCM Statistical Yearbook.

STUDY RESULTS

TABLE 1: MR results of model GP/L [1], model PP/L [2] and model GP/C [3]

$GP/L = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML$ [1]				$PP/L = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML$ [2]				$GP/C = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML$ [3]			
R square (RS)		0.72631266 (73%)		R square (RS)		0.82356666 (82%)		R square (RS)		0.25254393 (25%)	
Adjusted R Square (ARS)		0.54385443 (54%)		Adjusted R Square (ARS)		0.70594444 (71%)		Adjusted R Square (ARS)		-0.2457601 (-25%)	
Significance F (SF)		0.06516977		Significance F (SF)		0.01906159		Significance F (SF)		0.73398117	
Independent variables	Coefficients	Value of Coefficients (VC)	P-Value (PV)	Independent variables	Coefficients	Value of Coefficients (VC)	P-Value (PV)	Independent variables	Coefficients	Value of Coefficients (VC)	P-Value (PV)
	z_0	-5.7063658	0.73284638		z_0	-1.1889055	0.46760364		z_0	9.55789566	0.66491671
RURAL	z_1	0.10105129	0.99464287	RURAL	z_1	-0.405971	0.77972554	RURAL	z_1	8.03480322	0.68709213
URBAN	z_2	0.10083369	0.99465407	URBAN	z_2	-0.4059713	0.77971215	URBAN	z_2	8.03150281	0.68719402
FML	z_3	-0.1009306	0.99464911	FML	z_3	0.40597006	0.7797197	FML	z_3	-8.0332106	0.68714137
ML	z_4	-0.1008445	0.99465367	ML	z_4	0.40599252	0.7797079	ML	z_4	-8.0332523	0.68713985

[1] GP/L = z0 + z1RURAL + z2URBAN + z3FML + z4ML
Model [1] GP/L has RS = 0.72631266 (73%),
ARS = 0.54385443 (54%), meant that input data has been explained 54% by output result of regression. zo + z1 + z2 + z3 + z4 = -5.706255887 ≠ 0. PV has zo + z1 + z2 + z3 + z4 and are 0.73284638, 0.99464287, 0.99465407, 0.99464911, 0.99465367, respectively. The conclusion is the model built suitably to input data and it has statistical significance at the level of 0.06516977.

Independent variables have VC > 0 which are z1 and z2 and are 0.10105129 and 0.10083369, respectively. Whereby, RURAL and URBAN impacted on GP/L

Independent variables have VC < 0 are z3 = -0.1009306, z4 = -0.1008445. Whereby, FML, ML do not impact GP/L

[2] PP/L = z0 + z1RURAL + z2URBAN + z3FML + z4ML
Model [2] GP/L has RS = 0.82356666 (82%),
ARS = 0.70594444 (71%), which meant that input data has been explained at 71% by output result of regression. z0 + z1 + z2 + z3 + z4 = -1.18888523 ≠ 0. PV has zo + z1 + z2 + z3 + z4 are 0.46760364, 0.77972554, 0.77971215, 0.7797197, 0.7797079, respectively. The conclusion is that the model was built suitably to input data and it has statistical significance at the level of 0.01906159.

Independent variables have VC > 0 which are
z3 = 0.40597006, z4 = 0.40599252. Whereby, FML and ML impact on PP/L

Independent variables have VC < 0 and are z1 = -0.405971, z2 = -0.4059713. Whereby, RURAL and URBAN do not impact PP/L

[3] GP/C = z0 + z1RURAL + z2URBAN + z3FML + z4ML
Model [3] GP/C has RS = 0.25254393 (25%),
ARS = -0.2457601 (-25%) which meant that input data has not been explained by output result of regression. The conclusion is that Model [3] GP/C has not been built to be suitable to the input data, so there is no statistics significance of Model [3] GP/C.

TABLE 2: MR Results of Model PP/C [4] and Model Y [5]

$PP/C = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML$ [4]				$Y = z_0 + z_1RURAL + z_2URBAN + z_3FML + z_4ML$ [5]			
R square (RS)		0.1837616 (18%)		R square (RS)		0.99621996 (99.6%)	
Adjusted R Square (ARS)		-0.3603973 (-36%)		Adjusted R Square (ARS)		0.99369993 (99%)	
Significance F (SF)		0.84361172		Significance F (SF)		2.15436E-07(0.000000215)	
Independent variables	Coefficients	Value of Coefficients (VC)	P-Value (PV)	Independent variables	Coefficients	Value of Coefficients (VC)	P-Value (PV)
	z_0	1.29788098	0.58680978		z_0	88000.7205	0.84133368
RURAL	z_1	0.88810458	0.67943651	RURAL	z_1	-581865.37	0.17753917
URBAN	z_2	0.88765193	0.67957001	URBAN	z_2	-582202.89	0.17730151
FML	z_3	-0.8878883	0.67950027	FML	z_3	582035.72	0.17741979
ML	z_4	-0.8878905	0.67949955	ML	z_4	582035.238	0.17742009

[4] PP/C = z0 + z1RURAL + z2URBAN + z3FML + z4ML
Model [4] PP/C has RS = 0.1837616 (18%),
ARS = - 0.3603973 (-36%) which meant that input data has not been explained by output result of regression. The conclusion is that Model [4] PP/C has not been built to be suitable to the input data, so there is no statistics significance of Model [4] PP/C.

[5] Y = z0 + z1RURAL + z2URBAN + z3FML + z4ML
Model [5] Y has RS = 0.99621996 (99.6%),
ARS = 0.99369993 (99%), which meant that input data has been explained 99% by output result of regression. zo + z1 + z2 + z3 + z4 = -88003.4143 ≠ 0. PV has zo + z1 + z2 + z3 + z4 are 0.84133368, 0.17753917, 0.17730151, 0.17741979, 0.17742009, respectively. The conclusion is that the model was built suitably to input data and it has statistical significance at the level 2.15436E-07 (0.000000215).

Independent variables have VC > 0 which are z3 = 582035.72, and z4 = 582035.238. Whereby, FML and ML impact Y.

Independent variables have VC < 0 and are z1 = -581865.37, and z2 = -582202.89-0.405971. Whereby, RURAL and URBAN do not impact Y.

DISCUSSION

Based on table 1 and table 2 presented above, whereby, model [1] GP/L, model [2] PP/L and model 5[5] Y have been built suitably to input data, they have statistical significance at the level 0.06516977, 0.01906159, .15436E-07 (0.000000215), respectively. Model [3] GP/C and model [4] PP/C have not been built to be suitable to the input data, so there is no statistical significance of them.

Model [1] GP/L has (RURAL) z1 = 0.10105129 and (URBAN) z2 = 0.10083369 impact on GP/L. (FML) z3 = -0.1009306, (ML) z4 = -0.1008445 do not impact on GP/L. Model [2] PP/L has (FML) z3 = 0.40597006 and (ML) z4 = 0.40599252 impact on PP/L. (RURAL) z1 = -0.405971 and (URBAN) z2. = -0.4059713 do not impact on PP/L. Model 5[5] Y has (FML) z3 = 582035.72 and (ML) z4 = 582035.238 impact on Y. (RURAL) z1 = -581865.37 and (URBAN) z2 = -582202.89-0.405971 do not impact Y.

CONCLUSION

The study results shown and the discussion described showed that RURAL and URBAN population of Vietnam affect GP/L productivity which is calculated based on labour of LTI. FML population of Vietnamese and ML do not impact GP/L productivity according to labour of LTI calculations. FML population of Vietnam and ML population of Vietnam have impact on PP/L productivity of passenger which is calculated based on labour of LTI. RURAL and URBAN resident population of Vietnam do not impact PP/L productivity of passenger based on calculations of labour of LTI. FML and ML population of Vietnamese affect Y Gross domestic products. RURAL population of Vietnamese resident in Rural and URBAN Vietnam do not impact Y Gross domestic products.

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