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# Contribution to income inequality by income source:

## A comparison across ethnic groups in Vietnam<sup>1</sup>

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### Abstract

This study explores the dynamics of income and income inequality in Vietnam from 2004 to 2014. Two main sub-population groups are investigated: the ethnic majority, known as the Kinh people, and the minority group, which includes 53 minor ethnicities in Vietnam. The findings show that income gap among ethnic groups has increased over the last decade. The Gini index decomposition indicates that wages and nonfarm income are the two main determinants of income inequality. Cultivation and agricultural side-line incomes were relatively evenly distributed, despite their recent smaller equalizing effect. Both sub-population groups have experienced a decreasing contribution of the agricultural sector to overall household income. The changes in income inequality in Vietnam by income sources reflect the economic structure change of the economy from the agricultural reliance to non-agricultural economic activities.

JEL classifications: D31, D33, D63

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Keywords: Income inequality, ethnicity, decomposition, Vietnam

## 1. Introduction

Concerns about increasing income inequality are an emerging issue both globally and domestically in Vietnam, which is the setting for this study. Global inequality has reached new extremes (Dabla-Norris, Kochhar, Suphaphiphat, Ricka, and Tsounta, 2015). In several developed countries, such as Italy, the Republic of Korea, the United Kingdom and the USA, income inequality has been continuously rising, while there is a mixed trend in developing countries (Furrer, 2016).

Milanovic (2013) indicated that globalization has benefited the top income groups more than the bottom income groups between 1988 and 2008. The top 1% income group increased their income more than 60% over the last 20 years, while the bottom 5% only managed to maintain their income at the same level in real terms. Oxfam (2017) points out that global wealth is increasingly owned by an ever-diminishing number of rich people. Similarly, Berg (2015), Dabla-Norris et al. (2015), and Haldane et al. (2015) note that there is a widening income gap in several countries.

In recent decades, Vietnam has succeeded in increasing average income per capita and making significant poverty reduction. However, Vietnam has not made a significant improvement in income inequality. McCaig, Benjamin, and Brandt (2009) found that the Gini coefficient of income inequality remained stable in the early 2000s, and even there was a modest rise in income inequality after 2004 (Kozel, 2014).

In addition, the absolute income gap between the richest and the poorest has become greater by any measure (Benjamin, Brandt, & McCaig, 2017; Kozel, 2014). The daily income of the richest in Vietnam is observed to be equal to ten-year income of the poorest (Oxfam, 2017). Similarly, the income gap between rural and urban households has widened, and within rural areas there exists concern about a rapidly increasing income disparity. Indeed, the Gini coefficient in rural areas increased from 0.365 in 2004 to 0.413 in 2010, while it remained stable for urban areas at 0.381 (Kozel, 2014). This disparity mainly results from

the over-representation of ethnic minorities in the poorest group in rural areas. Consequently, the income gap between ethnic groups has been becoming an important issue for researchers and policymakers.

It is necessary to research inequality since this phenomenon may cause several socio-economic problems. Dabla-Norris et al. (2015) review a number of negative consequences from high income inequality. Amongst the consequences, increasing inequality can threaten sustainable economic growth through: raising social cost; ineffective growth policies, weakening growth efficiency; dampening growth drivers; causing financial crises, global imbalances and conflicts; and resulting in slowing poverty reduction.

In Vietnam, inequality is an emerging challenge for the sustainable development goal of poverty reduction. Although poverty has declined significantly over the last two decades e.g. the poverty rate in Vietnam has fallen from nearly 60% to 10%, the task of poverty reduction has not yet completed (Kozel, 2014). Nevertheless, the Vietnamese government aims to reduce poverty by two percentage points each year, and by four percentage points in the poorest communities. This ambitious target may be challenged, since poverty reduction is less responsive to the recent economic growth (Gibson, 2016). Dealing with poverty among Vietnam's the poorest is a major challenge since most of the poor are from the ethnic minorities. In 1998, these groups accounted for 29% of the poor, but this group made up 47% of the poor in 2010 (Tuyen, 2015). In addition, two thirds of people living in extreme poverty in Vietnam are from ethnic minorities.

Moreover, the economic growth has slowed down since 2010 in Vietnam, so concerns about dampening growth become even more pressing. Inequality can have a negative effect on economic growth as it prevents poor households from making desirable investment in human capital formation. As a result, lower-income households' children do not reach their potential health and education achievement. This therefore could reduce the labour productivity of Vietnam's economy in future (Galor & Moav, 2004; Stiglitz, 2012) as the productivity is the key driver of economic growth in the long run (Krugman, 1994). Providing further understanding about contribution to income and income inequality

between ethnic majority and minorities is thus necessary to help tackle down poverty. This is motivation of this study.

This study has several contributions to the literature. *First*, it is the first to identify the contribution of various income sources to total income inequality using the Gini decomposition method to investigate the disparities between and within the ethnic minority and ethnic majority groups in Vietnam. *Second*, this study provides an analysis of long-term changes in income components in Vietnam in the last ten years from 2004 to 2014. Furthermore, income inequality decomposition by income sources, based on the Vietnam Household Living Standard Surveys (VHLSS) carried out every two years, is expected to reduce the errors that resulted from data aggregation process. The decomposition by income source method allows identification of how much each income component contributes to changes in total income inequality. *Third*, income from social welfare and government transfers has often been aggregated into the “other income” category in previous studies (Tuyen, 2015; Tuyen, Lim, Cameron, & Huong, 2014). In this research, however, they are considered separately. As a result, the decomposed marginal effect of the income source allows evaluation of the effect of social welfare and government transfers on income inequality. Using an analysis of Gini decomposition by income source, our study has measured the contribution of each income source to and their impact on the overall inequality. Also, this approach allows us to explain why some income sources serve to increase inequality, while others serve to reduce inequality.

In addition, despite most research in Vietnam looking into rural and urban sub-population, this study concentrates on ethnic groups. The research looking into rural and urban division has several problems. A large number of people in this group are of working age, migrated to cities to seek for job opportunities. According to Demombynes and Vu (2016), there were more than 5.6 million people in Vietnam without permanent residency registration in their current place of residency due to internal migration and fast urbanization. People thus may be administratively classified as part of the rural population, but in fact are living in urban areas. This casts doubt on the accurate evaluation of income inequality using rural-urban comparison (Li & Gibson, 2013). In contrast, examination of income inequality between ethnic groups is much more reliably as the

measurement error tends to be lower. Last, the fairly homogenous sampling strategy and sample component from 2004 to 2014 provides reliable estimates and composition in this study, while many other studies used the VHLSS 2002 which include greater share of poorer households in the sample as the base year (Doan *et al*, 2017).

The study is organized as follows. Next section provides an overview picture of ethnicity and income structure in Vietnam. Section 3 is the data and methodology. Section 4 provides data analysis. Finally, section 5 contains conclusion and policy implications.

## **2. Background of ethnicity and income structure in Vietnam**

### *2.1 Ethnic geographical distribution in Vietnam*

Vietnam has 54 officially recognised ethnic groups, with more than 85% of the population made up of Kinh people. The rest of the population, 15%, is distributed among 53 ethnic minorities. Most of these ethnic groups, however, have a few thousand people each. According to the General Statistics Office Vietnam (GSO, 2015), of the ethnic minority group, the most numerous are the Tay (1.9%), Thai (1.8%), Muong (1.5%), Kho Me (1.5%), H'Mong (1.2%) and Nung (1.1%). Most ethnic minority groups reside in mountainous areas, while the Kinh and Chinese are found in the lowland areas in Red River delta, Central Coast and Mekong Delta. By comparison, the minority groups are primarily located in the East and West Northern mountains, in the Central Highlands, and in the North Central Coast.

### *2.2 Poverty distribution by ethnicity in Vietnam*

Since the economic reform introduced in 1986, known as “*Đổi mới*”, both majority and minority ethnic groups have experienced an improvement in living standards, which has been reflected in increasing average expenditure per capita, falling fertility rate and household size, and declining in the level of malnutrition (Epprecht, Müller, & Minot, 2011). However, Vietnam’s ethnic minority groups lagged behind the Kinh ethnic majority. Initially, early in the last decade, the ethnic minority groups achieved a significant success in poverty reduction, e.g. poverty rates fell from 75.2% in 1998 to 50.3% in 2008.

Nevertheless, ethnic minorities have increasingly accounted for most of the poor in Vietnam. Although they contributed only 15% of Vietnam's total population, ethnic minorities accounted for about half of the poor and 68% of the extremely poor (Kozel, 2014). Poverty rates among ethnic minorities average between four and seven times higher than that of the Kinh people. The malnutrition rate of children from ethnic minority households is also considerably higher than among children from ethnic majority households. Vietnam's poverty map shows that the majority of the poor live in the upland regions, whereas the better off households are found in Vietnam's urban centres along the coast.

There existed an increasing disparity between the ethnic majority and ethnic minorities among income percentiles in Vietnam from 1998 to 2010. In 1993, the ethnic minority was 1.6 times poorer than the ethnic majority. This gap increased to 2.4 times in 1998, 4.5 times in 2004 and 5.1 times in 2010. The proportion of the poor from Vietnam's ethnic minorities in 2010 was considerably higher than in 1998.

### *2.3. Ethnic group characteristics*

There is a large disparity between ethnic minority and majority groups in terms of education, health, infrastructure, and public services. Ethnic minority groups have lower educational attainment and more limited access to information. During the 1990s, there was a significant increase in primary and lower secondary education enrolments among ethnic minorities. Primary education is now almost universal in Vietnam, the disparities between ethnic groups at this level are small, and the enrolment rates of both ethnic groups are similar. The educational gap between two ethnic groups is also modest for the lower secondary education. For the upper secondary levels, however, the educational disparity has widened, with a larger absolute increase in enrolments for those of the Kinh ethnicity than for those from ethnic minorities.

Not only do ethnic minority groups face more disadvantages in education, but they also experience difficulties in access to transportation, credit sources, healthcare, job opportunities, land, and linkages to markets (World Bank, 2009).

#### *2.4. Government policies for ethnic groups*

The ethnic minority group has received considerable attention from the Vietnamese government. There is a ministerial-level government body called ‘the Committee for Ethnic Minority and Mountainous Area Affairs’, to monitor the socio-economic development of ethnic minorities and mountainous areas.

In addition, several programs have been implemented to improve living standards for the poor and ethnic minorities. For example, Program 133, Program 135, and Program 143 support these groups to gain access to education, healthcare, credits, information, and markets. These programs aim to reduce poverty and inequality. In 2014, 23.2% of households benefited from poverty reduction projects, with 14.8% of households were supported in buying health insurance, 10.7% of households benefitting from fee remission for medical examinations and treatment applied to the poor, and 3.4% of households benefitting from projects that provided favourable-term loans for the poor (GSO, 2015). The pro-poor programs or projects aim at improving income in agriculture, bringing in changes in income from households’ non-agricultural business activities, improved commune infrastructure, and off-farm employment during the agricultural off-season. However, these programs or projects were not very efficient, overlapped, or adequately supervised in their implementation.

#### *2.5 Changes in Vietnam’s income structure in Vietnam*

Income structure in Vietnam has changed over time. The proportion of income from agriculture has declined, while wage income has contributed to an increasing share of total household income in 2000s as well as in the previous decade. In rural areas, crop income and agricultural side-line income remained two main sources of household income, but together they contributed one third of total household income for top ten percentile income households. However, income from cultivation declined sharply by half compared with its level a decade ago (Benjamin et al., 2017; McCaig, Benjamin, & Brandt, 2009). The proportion of income from wages in rural areas increased faster than in urban areas. The share of wage income of the bottom-income household group increased faster than that of the top-income households.



In the meantime, in urban areas, changes in income structure have not been as fast as in rural areas in 2000s. However, wages had already become the main income source of urban households since the 1990s. The share of agricultural side-line income in total household income has remained stable at a small share in urban areas during the 2000s. The top income quartile households experienced a faster increase in income than the other quartiles. The income share from remittances and other income sources in 2000s has moderately decreased compared to the 1990s.

There was also a shift in the employment structure among ethnic minorities toward wages in nonfarm employment and nonfarm self-employment in the early 2000s (Pham & Bui, 2010). However, the ethnic minorities still received a smaller amount of their income from non-agricultural wages and nonfarm businesses. In the meantime, the ethnic majority received a higher portion of their income from wages (Cuong, 2012; Dang, 2012; Kozel, 2014). The main income source for the ethnic majority was from wage employment, whereas for the ethnic minority, the main source was crop income. Poorer ethnic minority households had a larger proportion of their total income from crops (Cuong, 2012).

In terms of employment, in 2006 agriculture accounted for 30% of ethnic majority employment, but made up 55% of ethnic minority employment (Kozel, 2014). There was a significant rise in income share from wages, while the level of income from the agricultural sector has declined. However, the change toward wage-earning employment of ethnic minorities was slower than those of the ethnic majority.

There are several studies on income inequality between ethnicities in Vietnam (Benjamin et al, 2017; Kozel, 2014; Cuong, 2012; Baulch, Pham, and Reilly, 2012; Baulch, 2011; Epprecht et al. 2011; World Bank, 2009; Van de Walle and Gunewardena, 2001). However, most of them focused on various characteristics to explain the widening income or income inequality gap. Although ethnic minorities have made significant progress in improving living standards, health and education in recent years, this group still lag behind the ethnic majority in terms of household per capita expenditure and income. The absolute gap between the ethnic majority and ethnic minorities widened

dramatically in the 2000s (Benjamin et al., 2017). The main causes of the disparity between the ethnic groups are differences in educational attainment, residential area, accessibility to public services and household assets (Cuong, 2012; Dang, 2012; Tuyen, 2016; van de Walle & Gunewardena, 2001; World Bank, 2009).

Furthermore, Benjamin et al. (2017) and Cuong (2012) find that the main contributors to the widening income gap are the ethnic minority's lower wages and lower non-farm business income. In addition, the income structure of the ethnic majority people has shifted from the agricultural sector to non-agricultural sectors more quickly than that of the ethnic minority. This income source disparity is also the drivers of the larger income gap between ethnic minority groups (Cuong, 2012).

Ethnic minority groups have lower social mobility, receive less investment in education, have limited access to health services, and lower civic and political engagement than the ethnic majority (Oxfam, 2017; Epprecht et al (2011). This affects their income and contributes more in widening the income gap with the ethnic majority.

### **3. Data and methodology**

#### *3.1. Data*

This study is based on a set of estimates of household income from the Vietnam Household Living Standard Survey (VHLSS), conducted by the General Statistics Office of Vietnam, with technical support from the World Bank and the United Nations Development Programme (UNDP). The survey covers several topics, such as employment, income, expenditure, assets, housing, education, living facilities, health, access to resources, and participation in poverty reduction programs.

This study makes use of data from 2004 to 2014,<sup>2</sup> six rounds of the survey were implemented during this period. The number of households each year is relatively similar as seen in Table 1. The sample is dominated by Kinh people,

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<sup>2</sup> We do not use the 2002 round data as its sample size is much larger, about 30,000 households, and consists of more observations of poorer households making it less comparable to other rounds of the VHLSS from 2004-2014 (Doan *et al*, 2017).

who consistently make up more than 82% of the sample, reflecting their relative proportion of the country's population. The study aggregates total income at the household level.

We excluded the top 1% and bottom 1% income percentile households in each year data to eliminate these extreme observations. This process provides robust estimates of trends in income inequality. Although the level of inequality is slightly reduced by the trimming, overall trends and patterns remain unaffected (McCaig et al., 2009).

Total household income is the sum of six income components. They are income from cultivation; agricultural side-line income (livestock, agricultural and forestry services, hunting, trapping, domesticating wild animals, and aquaculture); Non-farm business income; wages; social and government transfers; other income sources such as remittances, assistance and others. The income is the net revenue after expenses. All income includes cash and in-kind sources. Note that income is measured accounting for own consumption of products produced by households. This is because many ethnic minority and rural households are producers as well as consumers in Vietnam. This is also the case for rural households in developing countries (Deaton, 1997).

Two groups make up Vietnam's population: the ethnic majority (the Kinh people who consistently comprise more than 82% of sample) and the remaining 53 ethnic minorities which make up the rest of the sample, as shown in Table 1.

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### 3.2. Methodology

This study applies the decomposition method of the Gini coefficient, suggested by Lerman and Yitzhaki (1985). The Gini coefficient  $G_y$  can be decomposed as:

$$G_y = \sum_{i=1}^n G_i R_i S_i \quad (1)$$

Where  $y$  is total income,  $i$  is income source  $i$ . The sum of all income sources  $i$  is  $y$ .  $G_i$  is the Gini of income source  $i$ , it shows how equally or unequally each income source  $i$  is distributed.  $R_i$  is the Gini correlation of income source  $i$ , a measure of the correlation between income source  $i$  and the cumulative distribution of total income  $y$ . The Gini correlation  $R_i$  has similar properties to Pearson's correlation coefficient and rank correlation. It ranges between -1 and

+1.  $R$  is equal to +1 if an income source is an increasing function of total income, while  $R$  is equal to -1 if an income source is a decreasing function of total income.  $R$  is equal to 0 if an income source is constant, or the income source does not contribute to the share of the Gini coefficient.  $S_i$  is the share of income source  $i$  in total income  $y$ . The sum of  $S_i$  equals one.

Using this method provides information on the effect of changes in a particular income source  $i$  on overall income inequality. The following is the expression for the partial derivative of the overall Gini with respect to a percentage change ( $e$ ) in income source  $i$ :

$$\delta G_y / \delta e_i = G_i R_i S_i - G_y S_i = S_i(G_i R_i - G_y) \quad (2)$$

Equation (2) shows the marginal effect of the income source on overall income inequality.

To have percentage terms, we can divide both sides of equation (2) by  $G_y$  we then get (3).

$$\frac{\left(\frac{\delta G_y}{\delta e_i}\right)}{G_y} = \frac{G_i R_i S_i}{G_y} - S_i \quad (3)$$

Equation (3) shows that the percentage change in the Gini resulted from a small percentage change in an income source. The first component on the right hand side of equation (3) is the contribution of income source  $i$  in total income inequality or the share of income inequality of income source  $i$  in the overall income inequality, and the second component is the share of income source  $i$  in total income.

There are several advantages of this decomposition of the Gini coefficient. Firstly, this approach is an intuitive decomposition, which allows the formation of necessary conditions for stochastic dominance. Secondly, the decomposition provides a natural interpretation of the elements making up each income source's contribution to overall income inequality. That is, the contribution of each income source to total income inequality is the product of its own inequality ( $G_i$ ), its share of total income ( $S_i$ ), and its correlation with the rank of total income ( $R_i$ ). Thirdly, this method allows one to examine the marginal changes in the size of an income source in overall income inequality.

In addition, the method used here, following Lerman and Yitzhaki (1985), differs from the widely used Shorrocks' decomposition (Fournier, 2001), since the former applies to the Gini coefficient while the latter focuses on the coefficient of variation. The main distinction is the sensitivity to extreme values of the coefficient of variation compared to the Gini. However, both methods provide relatively similar values and directions for most of the variables (Rani and Furrer, 2016).

#### **4. Empirical analysis**

This section analyses the Gini index decomposition by income source from 2004 to 2014 in Vietnam using the VHLSS data. The results show the contribution of each income component to total income in Vietnam, to overall income inequality, and to relative income inequality. But before doing such analysis, we provide to overview income changes between 2004-2014.

##### *4.1 Change of average income per capita between 2004 and 2014*

This section discusses changes in average real income per capita in Vietnam between 2004 and 2014 for ethnic majority and minority sub-population.

Figure 1 shows average income per capita from 2004 to 2014 in real terms in 2010 using the VHLSS 2004-2014. At first glance, real income per capita has grown for both groups. However, the income of ethnic majority (Kinh) group has increased more rapidly than that of the ethnic minorities. Noticeably, in any year the majority has always had a much higher mean income than the minority. In 2004, for example, the average annual real income per household for the ethnic majority and the ethnic minority groups was about VND 47.1 million and VND 31.2 million. In 2014, these values were VND 78.2 million and VND 43.6 million. The relative income gap between the two groups has widened from 1.5 times to 1.8 times over the 10-year period.

The income growth rates of each income percentile and ethnicity vary significantly. The annual incomes of the 10% lowest income households have increased 12 times from VND 10,890,470 in 2004 to VND 134,901,230 in 2014, whereas household income for the top 10% income percentile climbed more rapidly by 16 times from VND 121,745,300 to VND 1,929,227,200 over the past ten years. Consequently, the income gap between the top 10 and bottom 10

percentile households has widened, in 2004 the gap was 6.1 times, but was 7.3 times in 2014.

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#### *4.2 Change in income structure from 2004 to 2014*

The structure change of income inequality by income sources is presented in Figure 2. There was a transition in income structure during the study period. In particular, income from the agricultural sector shrank relative to the non-agricultural income. Among the six income categories, wage and salary income accounted for the largest proportion, followed by nonfarm income, which includes revenue from cultivation, agricultural side-lines, other income, and social transfers. Share of wages in total household income grew rapidly from 30% in 2004 to 46% in 2014.<sup>3</sup>

Although the wage portion increased significantly, its share in total household income in Vietnam remains smaller than in several other developing countries. According to the Global Wage Report 2014/2015 (ILO, 2014), wage income contributes up to 60% of total household income in developing countries.

The second largest income source is nonfarm activities, such as manufacturing, mining, and income from renting out the house and residential areas. The contribution from these incomes has been stable at about 20% for the study period. The portion of income from other sources, such as overseas and domestic remittances and gifts, has decreased dramatically, and share of income from cultivation has also decreased from 19% in 2004 to 14% in 2014. The share of other income sources has declined from 18% to 10%. The changes in income structure in Vietnam over the ten-year period reflect the transformation of the economy towards a less agriculture-reliant economy.

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Changes in income structure vary across ethnic groups. The ethnic majority experienced a sharp decrease in income from cultivation, agricultural

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<sup>3</sup> Nominal income by source across years can be seen in Appendix 2.

side-lines, social and government transfers, and other sources. In the meantime, the ethnic minorities have been still more reliant on agricultural income than the Kinh people. Besides cultivation income, ethnic minorities also earned a larger income proportion from agricultural side-lines and transfers for education and healthcare than that of the ethnic majority. Ethnic minority groups also receive a smaller proportion of their income from wages, nonfarm earnings, and other income components. The ethnic majority receive three times more nonfarm earnings than the minority, although the wage income of the ethnic minority group has doubled during the ten-year study period.

In summary, all ethnic groups have experienced an increasing share of income from wages. However, the growth rate of wage income share for the ethnic minorities has been faster than for the ethnic majority group. Income from the agricultural sector has still played a significant role for all ethnic groups, despite its decreasing contribution to total household income.

#### *4.3 The trend of Gini index over 2004-2014*

This section discusses the Gini coefficient and how it has changed over the period, and the changes in income structure in Vietnam.

The Gini index in Vietnam has changed its direction, with an uphill trend evident before 2010 and a downhill trend after 2010. The Gini coefficient calculated for ethnic majority shows a similar trend. In contrast, the Gini calculated for the ethnic minorities has increased constantly over the same period.

In 2004, Vietnam's Gini index was 0.369. It then reached a peak of 0.390 in 2010, before declining to 0.385 in 2014. Up to 2012, the Gini index calculated for the population has been always higher than the Gini for each ethnic group. The gap in the Gini between the majority and minority ethnicities has increased. Specifically, the gap between two ethnic groups accounted for 12.6% of the Gini in 2004. However, the gap rose to 18.1% in 2014. By contrast, the Gini index calculated within each ethnic group accounted for a smaller share of total income inequality. In 2004, for example, it contributed 75.8% of total income inequality, and then decreased to 71.7% over the ten-year period. However, the Gini index within each ethnicity was not calculated separately for each ethnic group. The

details for the ethnic minority and ethnic majority groups are presented in Figure 3.

The Gini index for Vietnam's general population has declined after 2010, but it has increased for ethnic minority group. In 2014, the Gini coefficient for the minorities reached the highest ever observed during the study period. This reflects increasing income disparity within ethnic minority households for different ethnicities in Vietnam.

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The Gini index calculated in this study shows a similar trend when compared to other studies but is less volatile. Benjamin et al. (2017) have shown that Vietnam's Gini index had an upward trend from 2004 to 2008, then reached its peak in 2010, but had a downward trend between 2010 and 2014. Our Gini estimate of 0.390 is very close to the Gini index calculated by Benjamin et al. (2017) at 0.396.<sup>4</sup> However, the trend is consistent across these studies.

#### *4.4 Income inequality by income sources*

- Proportion of income inequality

Except for wages, the contribution of each income component to total income inequality showed a downward trend. Wage income has increasingly contributed to total income inequality, from about one third in 2004 to more than half in 2014. Figure 4 shows a significant rise in the contribution of wage income to income inequality in 2014.

Nonfarm income was the second largest contributor to income inequality in both years 2004 and 2014. The cultivation and agricultural side-lines contributed approximately 10% each to total income, but their proportion in income inequality was less disproportional, at 7% and 5% respectively.

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<sup>4</sup> Benjamin et al. (2017) used household size as a weight in estimating per capita income distribution, while ours were adjusted for sampling weights. In addition, our removal of top 1% and bottom 1% income households may result in the disparity with other study.



Furthermore, income from transfers and other income played a key role in moderating inequality. For example, the proportion of income from other sources dropped dramatically from 21% in 2004 to 7% in 2014. Transfers such as subsidies for education and healthcare had a minor impact on income inequality in 2014. Thus, wages and nonfarm income are the main sources contributing to the income gap in Vietnam from 2004 to 2014. The remaining income sources have little effects on income inequality. Our result is similar to those of Kozel (2014), International Labour Office (2014), and Benjamin et al. (2017). These studies also find that income from agriculture contributes positively to income equalization while nonfarm income was distributed unevenly.

Changes in income inequality components for the ethnic majority group have also followed the similar pattern (Figure 5). Income from wages contributed half to total income inequality, followed by nonfarm income at 30%. The remaining income components have had small income inequality effects. Income from cultivation and agricultural side-lines added 8% and 5% to overall income inequality, respectively. Moreover, income from social transfers has equalized incomes among the ethnic majority. Noticeably, income from other sources dramatically reduced its portion of income inequality, from 21% in 2004 to 6% in 2014.

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The ethnic minority groups differed from the ethnic majority in terms of the contribution of income sources to overall income inequality. Wage and salary income was the main contributor, at about 50%, to overall income inequality. Wage and salary income dramatically increased inequality for minority groups over the last 10 years. Specifically, the contribution of wages and salaries to income inequality doubled, from 27% in 2004 to 57% in 2014 (Figure 6).

Nonfarm income was the second largest source of income inequality for both ethnic groups, but its contribution in income inequality was higher (20%) for the ethnic majority than for the ethnic minority (13%). The contribution of this income source and agricultural side-line income in inequality has declined faster for ethnic minorities than those of ethnic majority (see Figures 5 and 6). We also observed a fast decline in contribution to income inequality from government transfers and other incomes for ethnic minorities (Figure 6).

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- Relative income inequality

The following analysis will concentrate on the relative inequality resulting from each income source. Relative income inequality is defined as a ratio of income inequality share ( $I$ ) and its income share of income source  $i$  ( $S$ ). This analysis is needed because a large contribution to income inequality may not reflect the truly dis-equalizing effect of the activity since it also depends on its proportion of total income. This index is represented by the ratio between the share of income inequality ( $I_i$ ) of the income source  $i$ , and share of the income  $i$  in total income  $y$  ( $S_i$ ). If the relative income inequality of a certain income source  $i$  is greater than one, it will increase the relative inequality by more than its income share increase in the total income. In this case, it is called dis-equalizing. However, if the value of relative income inequality is less than one, it is called a relatively equalizing factor.

Figure 7 shows that in 2014 the relative income inequality from nonfarm and wage income is greater than one, while income from government and social transfers, agricultural side-lines, cultivation and other income is smaller than one. This suggests that income from the former group relatively increased income inequality, while income from the latter group tended to reduce income inequality.

Moreover, the former income group has a strong correlation with total income as indicated previously. For example, the Gini index and the correlation of wages income are around 0.6 and the relative income inequality index is 1.1 (see Figure 7 and Appendix 1). Although wage and salary income has shown relative income inequality to be slightly greater than one, this value declined between 2004 and 2014.

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Nonfarm income had the highest relative income inequality value (Figure 7 and Appendix 1). This implies that nonfarm activities are the key driver of income inequality in Vietnam. This holds for both ethnic majority and minorities. Interestingly, the changes in relative income inequality from nonfarm sources

followed the path of the Gini index trend. In contrast, other income and government transfer income has reduced income inequality and their relative income inequality declined significantly over the study period, suggesting they have an equalizing effect on income inequality, but the effect on relative income inequality has been decreasing significantly over the ten-year period (Figure 7).

There exists a disparity in the level of relative income inequality from income sources between two ethnic groups. For the ethnic majority, the trend of relative income inequality is well in line with those of the overall population. For ethnic minorities, the overall relative income inequality rapidly decreased from 0.66 in 2004 to 0.58 in 2014. Wages and nonfarm income are distributed more unequally for the ethnic minorities than for the majority group (see Figures 9 vs. 8). Income from agricultural side-lines and transfers had a greater equalizing effect among the ethnic minorities than it did for the ethnic majority.

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Social transfers' relative income inequality in 2014 was 0.006, which is 18 times smaller than in 2004 for ethnic minorities. While other income also contributed to equalization for ethnic minority, its effect was smaller than for the ethnic majority group.

However, the relative income inequality of nonfarm, agricultural side-line and cultivation income has slightly increased over the period for ethnic majority, but that of the minorities has significantly declined.

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- Marginal effect of income sources on income inequality

Figure 10 illustrates the marginal effect of income sources on overall income inequality. The type of income with an equalizing effect is expected to have a negative marginal effect. Such income is observed from cultivation, agricultural side-line activities, government and social transfers, and income from other sources in 2014.

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Income from cultivation and agricultural side-line activities has the greatest effect on equalizing incomes. Whereas the effect of these income sources

has rapidly declined among Kinh ethnic households, it has a significant equalizing influence on ethnic minority households. For example, in 2014, a 1% increase in cultivation income could decrease the Gini index by 0.041% for the ethnic majority and by 0.116% for ethnic minorities.

Over time, social and government transfers for education and healthcare have had a greater effect on reducing income inequality. For instance, one percentage increase in this source could reduce the Gini index by 0.002% in 2004, but reduce the index by 0.007% in 2014. Interestingly, income increased inequality before 2008, but has reduced the income gap since 2010. All ethnic groups have experienced the same trend for marginal effects, but ethnic minority households experienced a higher impact from each income source. These income sources are possible tools to narrow the income gap between households.

Conversely, the marginal effect of income from wages and nonfarm activities has clearly been positive. Interestingly, the marginal effect from wages is five times greater for ethnic minorities than for ethnic majority. The marginal effect of other income has experienced dramatic change from a positive value before 2008 to negative values after 2008.

## **5. Conclusions and policy implications**

This study uses the inequality decomposition method to investigate the effect of particular income source on overall income inequality in the period 2004 to 2014 in Vietnam. A parallel analysis for the ethnic groups was provided for the dominant Kinh group and for all other ethnic minorities. Although Vietnam experienced an increase in the Gini index from 2004 to 2010, it has decreased from 2010 to 2014. The Gini index calculated separately for Vietnam's ethnic majority shows a downward trend, while this index for its ethnic minorities revealed an upward trend.

There have been changes in income structure in Vietnam over the last decade. The income share from wage earnings has expanded significantly for all ethnic groups. This source accounts for half of total income for the ethnic majority (the Kinh people) and 40% for ethnic minorities. However, the portion of wages income for the ethnic minority has increased faster than for the ethnic majority.

Nonfarm income is the second largest share of total income for the ethnic majority group. However, this income source accounts for about 10% of total income for ethnic minorities. The minorities depend more heavily on income from cultivation than do the majority. The other income sources contribute a relatively small proportion of the total. While the contribution of other income and agricultural side-line income has declined dramatically, social and government transfers have been stable at about one percent. Other sources have accounted for only a small proportion of total income.

The share in total income and income inequality constituted by wage income has been expanding in Vietnam during the study period. However, wage income is distributed more evenly, since this source has increased more quickly for the lowest income households. This suggests that wage income has had a more equalizing effect recently.

The Gini index or overall income inequality in Vietnam is mainly explained by wages and nonfarm income. Besides wage income, the differences in the income inequality structure between the two ethnic groups derive from differences in the contribution of crops and nonfarm activities. While cultivation income provides a larger share of both total income and overall income inequality for ethnic minorities, it is nonfarm income that matters more for Kinh people.

The relative income inequality for wages and nonfarm income, which are greater than one, suggest the dis-equalizing effect of these sources of income. This is true for both ethnic groups. Although cultivation and agricultural side-line activities have an equalizing effect, this has decreased slightly. Other income underwent significant change in 2008, from being a dis-equalizing source to becoming an equalizing source. Income from social transfers has reduced inequality over the last decade. This source has become more significant in terms of scale in total household income and being a more equalizing factor for the ethnic minorities than for its ethnic majority counterpart.

Another useful implication is that promotion of cultivation and agricultural side-line activities might increase income for those at the bottom of the distribution, especially among the ethnic minorities. This is because, apart from being an inequality-reducing source, these activities have remained a major income source for for poor and extremely poor households.

Despite the concern that agricultural growth might not offer an effective way out of poverty (Tuyen, 2015), the result of our study suggest that by improving agricultural productivity, the poor and extremely poor can increase their income, which in turn might help reduce poverty as well as inequality.

Overall, the changes in income inequality in Vietnam by income sources reflect the economic structure change of the economy from the agricultural reliance to non-agricultural economic activities. Wage earnings have increasingly become an important source of household income. Any future studies of the structure of income inequality should focus particularly on sources of wage inequality.

In Vietnam, the gap in educational attainment has decreased since the government introduced universal primary education policy in 2001. However, it is challenging to get children from poor rural households as well as ethnic minority households to enrol and remain at school. Sixty-five percent of the ethnic majority children enrol in secondary education, whereas the rate is just 13.7% for ethnic minority children. The gap in education participation is even much larger at higher educational levels (Oxfam, 2017). In addition, given our finding that the economic structure change of the economy from the agricultural reliance to non-agricultural economic activities has been fast, wage earnings have increasingly become an the most important source of household income, and the relative income inequality for wages and nonfarm income have had the dis-equalizing effect on income inequality, these suggest that improving access to education for poorer children especially children from ethnic minorities will enhance human capital formation and then improve future job opportunities to successfully eliminate poverty for the poor.

We acknowledge that our study has some limitations. McCaig, Benjamin, and Brandt, (2015) noted that nonfarm self-employment incomes, or even agricultural incomes, are likely to suffer from a substantial degree of measurement error. Uncommonly, high income from these sources will produce a high estimate of overall income. If genuine, the Shorrocks decomposition will precisely consider this as an inequality-increasing income source. Nevertheless, if suffered from measurement error, the effect of this income source will be amplified, while the effect of other income sources will be devalued. Using a regression

framework allows ones to focus on the potential impact of measurement error on skewing the estimated contribution of an income source to overall inequality. A natural way to account for measurement error is to use the method of instrumental variables (McCaig et al. 2015). However, it is often not practical to find a valid instrumental variable in most empirical studies (Wooldridge, 2013), Thus, this suggests a potential venue for future studies using the instrumental variable method for addressing measurement errors.

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