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Determinants of income inequality

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Abstract

This study examines whether changing economic structure, social conditions, and financialization are responsible for increased income inequality in Indonesia. By employing panel data of 32 provinces in Indonesia that spans from 2007 to 2013, it finds that structural change affects income inequality, increased share of finance reduces inequality, which is against the financialization hypothesis, and social conditions have expected effects on income inequality. While an increased share of both agriculture and service sectors tends to reduce inequality, an increased share of manufacture sector has no effect on inequality. This study finds that falling poverty increases inequality, implying that policy to reduce poverty might not be neutral for inequality and instead cannot prevent it from increasing. Since the higher the college participation rate the higher income inequality tends to be, it does not automatically imply that in order to reduce inequality we need to reduce the number of people who go to college. It might be the case that the college participation rate has not reached a turning point, below which its increase increases inequality, but beyond which its increases reduces inequality.

Abstrak

Penelitian ini mengkaji pengaruh perubahan struktur ekonomi, finansialisasi, dan kondisi sosial terhadap ketimpangan pendapatan. Menggunakan data panel dengan cross-section 32 propinsi di Indonesia dan rentang waktu 2007-2013, penelitian ini menemukan bahwa perubahan struktural mempengaruhi ketimpangan, kenaikan sumbangan sektor keuangan dalam PDB cenderung menurunkan ketimpangan, yang berarti bertentangan dengan hipotesis finansialisasi, dan kondisi sosial juga berpengaruh terhadap ketimpangan. Sementara kenaikan sumbangan baik sektor pertanian maupun sektor jasa dalam PDB cenderung mengurangi ketimpangan, kenaikan sumbangan sektor industri terbukti tidak mempengaruhi ketimpangan. Studi ini juga menemukan bahwa turunnya tingkat kemiskinan justru manaikkan ketimangan, sehingga kebijakan untuk menurunkan kemiskinan bisa bersifat tidak netral terhadap ketimpangan, melainkan tidak mampu membiarkan ketimpangan untuk tidak naik. Juga ditemukan bahwa kenaikan angka partisipasi kuliah justru menaikkan ketimpangan, yang mengimplikasikan bahwa angka ini belum mencapai titik belok (turning point).

Introduction

Income inequality has been increasing in recent years in most countries in the world. Figure 1 shows the downward trending labor shares of income in both advanced countries and emerging and developing countries, which is suspected of being behind the increased income inequality, while lower labor shares strongly associated with higher income inequality (measured by Gini coefficients) both across countries and over time within countries (IMF, 2017). It might be the case that increased income inequality results from falling shares of labor income. Indonesia and ASEAN countries are not excluded. The World Bank (2016) revealed that income inequality in Indonesia has been deteriorating recently. The Gini coefficient significantly increased from 0.30 in 2000 to 0.41 in 2013, 2014, and 2015. This means the pie of economic growth over the past decade has mostly been enjoyed by the top 20 percent of the population, leaving behind the remaining 80 percent (or 205 million people). Further, while the consumption per capita for the

top 10 percent of Indonesians grew by over 6 percent annually, for the poorest 40 percent it grew by less than 3 percent annually between 2003 and 2010. In the ASEAN region, in fact income in Indonesia had been distributed more fairly than in its neighboring countries over the previous three decades that ended in 2009 or 2010. However, as shown by Figure 2, due to its faster growth in Indonesia than in the other three countries since 1999, the level of income inequality in Indonesia has finally surpassed and become higher than the level in the neighboring countries since 2010.

Income distribution across regions within Indonesia also shows similar pattern. Not only does the level of inequality greatly vary across provinces, it also has increased quite significantly over the period 2008-2015, from 0.32 to 0.41 on average, as shown in Figure 3. The inequality level in Papua Barat Province is the highest and above the national average in both years, and the lowest in Kepulauan Bangka Belitung. There were 16 provinces with inequality level higher than the national average in 2008 and only 7 provinces in 2015. This means the increased inequality level over the past 7 years has been concentrated in few provinces. These 7 provinces have been experiencing more than proportionate increase in inequality level than other provinces. Specifically, Papua Barat has suffered the highest increase in the level of inequality with the Gini ratio increasing by 13 basis points, followed by DKI Jakarta and Jawa Timur with the Gini rising by 10 and 9 basis points, respectively.

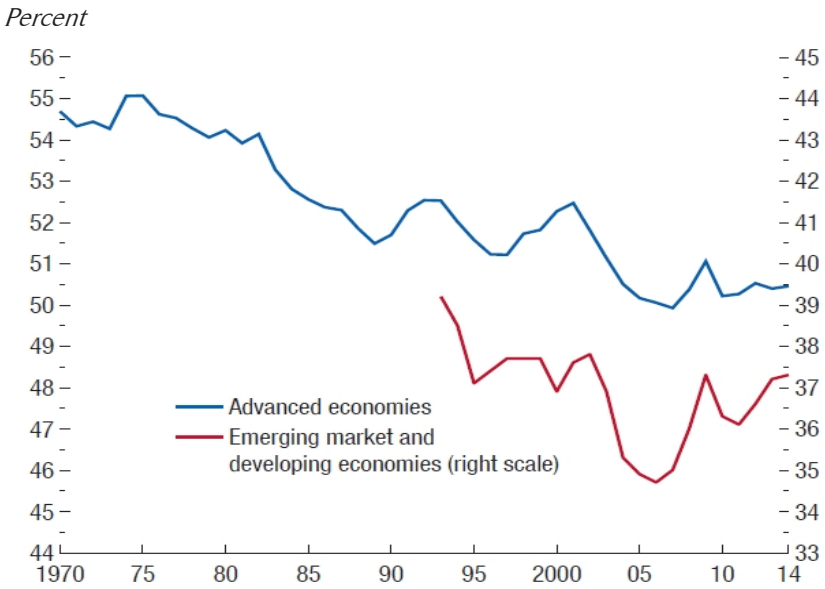


Figure 1. Labor shares of income

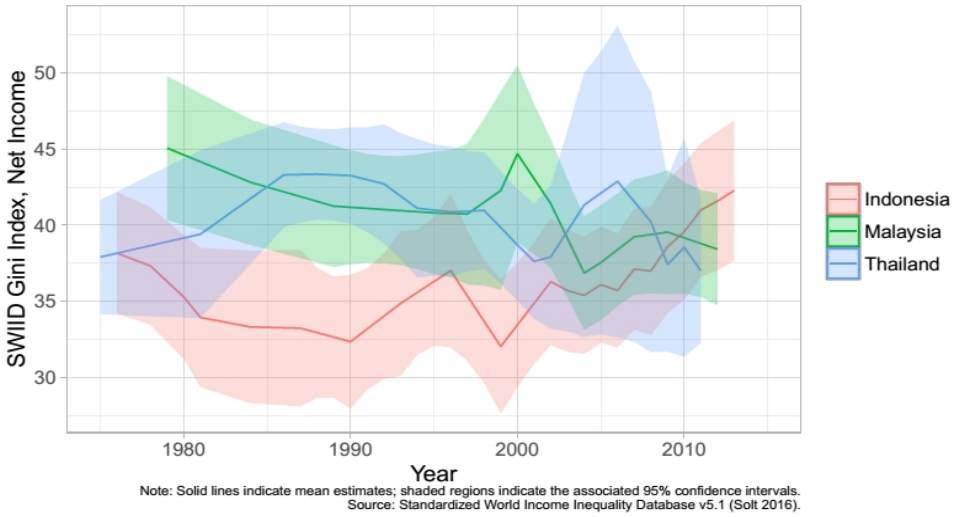
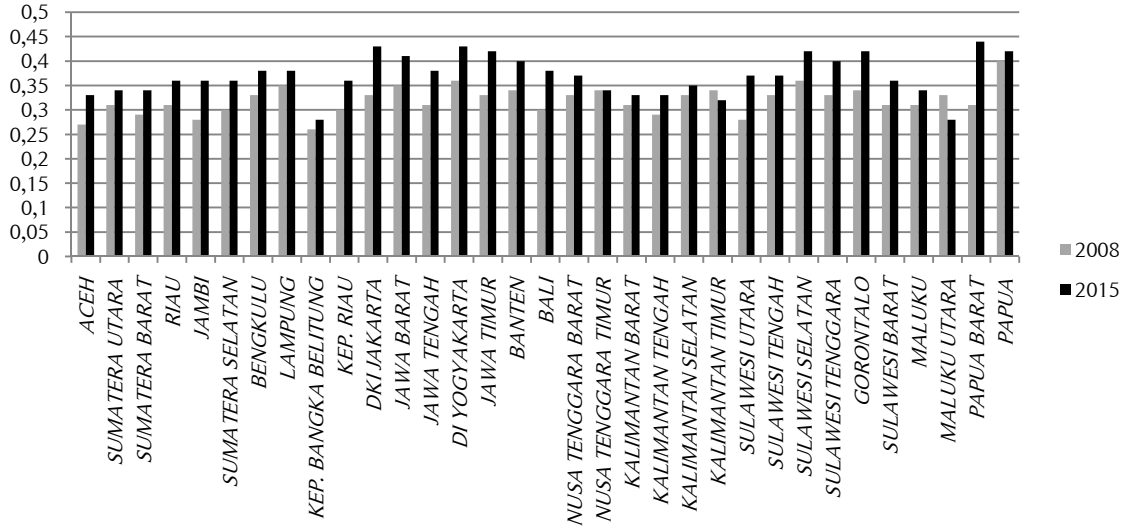


Figure 2. Income inequality in Indonesia, Malaysia, and Thailand (Solt, 2016)



Source: Statistics Indonesia, 2017

Figure 3. Gini ratio across different provinces in Indonesia in 2008 and 2015

This increased inequality has also actually been felt by the ordinary people in their daily lives. A survey conducted among Indonesians by the World Bank (2016) reports that the majority of them feel that the income distribution in Indonesia is "very unequal" or "not equal at all". The report raises a worry that regions with a higher level of inequality than the national average have 1.6 times more chances of experiencing social troubles. Not only will an unequal distribution likely produce negative effects on society, it also tends to slow down economic growth in the long run. The following questions, therefore, are worth asking. Why is it that the level of inequality differs across provinces and has been increasing over the past decade in Indonesia? What factors are responsible for these differences and the increase in the level of inequality across provinces over the past decade? Why have some provinces been experiencing more than proportionate increase in the level of inequality than other provinces over the past decade? Right answers to these questions might help provide formula as to what should be done to reduce the level of inequality across provinces and years.

In the literature various views have proposed explanations for the increased levels of income inequality. While some scholars have attributed the increased levels of income inequality to economic restructuring processes, others have suggested that changing social conditions or the combination of the two were mainly responsible for the phenomenon (Albrecht & Albrecht, 2007). Other scholars have argued that technological changes (Blanchard, 1997), globalization (IMF, 2007; Kanbur, 2015), weakening of labor's bargaining position (Blanchard & Giavazzi, 2003), and financialization (Dünhaupt, 2012, 2016; Hein, 2015; Stockhammer, 2012; Van Arnum & Naples, 2013) were responsible for the increased inequality. Financialisation can be described as an increasing importance of financial sector in the economy that tends to have impact on the distribution between wages and profits, on the one hand, and retained earnings and financial income in the form of dividends and interests, on the other (Sawyer, 2014).

In a study aimed at investigating the sources of increased income inequality in the U.S., using county-level data for the US, Albrecht & Albrecht (2007) found that social conditions were much more strongly related to inequality than economic structure. The two social conditions most strongly related to inequality included female employment and the percent of female-headed households. IMF (2007) reviewed current research that links globalization to inequality where some researchers show that globalization accentuates inequality both within and between countries, while others claimed the opposite, arguing that globalization has disintegrated national borders and prompted economic integration, lifting millions out of poverty, and closing the inequality gap. As for link between financialization and inequality, Dünhaupt (2012) attempted to determine whether financialization is responsible for the falling labor share of income in the USA and Germany. By splitting the observed profit share of the two countries into the share of retained earnings and the share of net property income (rentiers' income) as proxy for financialization, he found that for the US the important shift towards financialization occurred in the early 1980s where the share of rentiers income increased exactly at that time and remained on a higher level until the

end of the observation period, while for Germany the process started much later, in the beginning of the 1990s. Hence financialization tended to be responsible for the fall in the labor share of income in both countries during the period under study. This results is corroborated by his later study where, using dividend and interest payments of non-financial corporations to represent financialization and employing a time-series cross-sectional dataset of 13 countries over the time period from 1986 until 2007, he found support for the existence of a relationship between increasing dividend and interest payments of non-financial corporations and the decline of the share of wages in national income Dünhaupt (2016). These results found support from similar studies (Hein, 2015; Stockhammer, 2012; Van Arnum & Naples, 2013). While Hein (2015) and Stockhammer (2012) employed the shift in the financial sector share in the economy and the increase in management salaries and rising profit claims of the rentiers to capture financialization, and Van Arnum & Naples (2013) made use of the relative share of financial sector in GDP, all of them found that financialization has contributed to the falling labor income share and income inequality since the early 1980s. However, this nearly conclusive result that established the link between financialization and increased inequality relies exclusively on studies for advanced countries. Studies on the same issue for developing countries are extant.

The primary objective of this paper is to empirically investigate the behavior of income inequality in Indonesia. In particular it aims at answering the question as to why income inequality in Indonesia as a whole and across provinces has been increasing over the last decade. In doing so, following the literature, it employs the explanatory variables that represent economic structure, sociological conditions, and financialization. Unlike in (Albrecht & Albrecht, 2007; Chevan & Stokes, 2000) where the economic structure variable is measured by the proportion of labor force employed in each sector in the economy, here we measure it using the share in gross regional domestic product (GRDP) of each sector in each province. Since the sectors in the economy are disaggregated into nine sectors, the economic structure variable is broken down into nine variables that include the share in GRDP of each of the 9 sectors. One of these variables, the share in GRDP of Finance, Real Estate and Business Services (FREBS), is taken as representing the degree of financialization. This follows the financialization literature and especially the step of Van Arnum & Naples (2013) who employed the share in GDP of FIRE sector that includes finance, insurance, real estate industries as proxy for financialization in their study. The share of this sector in GRDP measures the increasing importance of financial sector in each Indonesian province whose growth might have taken place at the expense of the non-financial sector and the wage of its workers and other ordinary wage earners in general. Therefore, we hypothesize that there will be a positive relationship between the GDP share of financial sector and income inequality. Further we make use of college participation rate and absolute poverty rate as variables that represent social conditions variables, owing to (Van Arnum & Naples, 2013), instead of (Albrecht & Albrecht, 2007).

Arguably thus far there have been no similar studies conducted for Indonesia. Among the empirical studies on income inequality for Indonesia that have been conducted, most of them, for example (Akita, Lukman, & Yamada, 1999; Akita, 2003; Alisjahbana et al., 2003; Cameron, 2000; Chongvilaivan & Kim, 2016; Kaneko, Kaneko, & Managi, 2007; Leigh & van der Eng, 2009; Nugraha & Lewis, 2013) focus more on income inequality decomposition between sub regions and sub groups and income inequality measurement and its development. None of them has been investigating whether economic structural changes, sociological conditions and financialization are responsible for the change in income inequality in Indonesia. Akita (2003) applied the two-stage nested Theil decomposition method of regional income inequality, instead of personal income inequality, in China and Indonesia using a district as the underlying regional unit to measure regional income inequality. Further, Leigh & van der Eng (2009) estimated top income shares for Indonesia during 1920-2004 using taxation and household survey data and suggested that top income shares grew during the 1920s and 1930s, but fell in the post-war era, and increased again sharply during the late-1990s, coinciding with the 1997-98 economic crisis, a finding that contradicts the view that Indonesia is a relatively egalitarian society. The rest of these previous studies mainly dealt with income inequality decomposition and did not touch upon the issue attempted to address in the present study. This is the gap the present study intends to fill in and in that way contributes to the current literature on income inequality.

The remaining of this paper is organized as follows. The second part reviews the theoretical explanation for the change in income inequality and elaborates on the potential explanatory variables that are used in the empirical part. The third part of this article outlines research method that includes the dataset along with its sources and the empirical specifications of the econometric model that is used. While the fourth presents the empirical results, the last part concludes.

Possible explanations for changing income inequality

The view that regards economic restructuring processes as the main determinant of increased income inequality, especially in the United States and most developed countries, was pioneered by the study of (Kuznets, 1955). He argued that there is a tendency for the relationship between economic restructuring and inequality to follow a pattern resembling an inverted U. That is, income inequality would initially increase during the early stages of economic restructuring from a dependence on agriculture to a dependence on manufacturing, and then reach a peak, level off, and eventually decline. Kuznets noticed that as industrialization was underway in the United States in the 1800s inequality initially increased, achieved maximum in the 1890s, stabilized for several decades, and finally declined in the 1920s (Alderson & Nielsen, 2002). Thus the stages of increasing and stabilizing inequality lasted more than 100 years before it finally declined. Results from subsequent studies largely supported Kuznets pattern for the United States and other advanced economies (Lindert, 2000; Nielsen & Alderson, 1997).

However, the decline did not last forever. Income inequality began to increase in the 1970s in the United States and other advanced economies and continued through the present days, thereby following a pattern resembling an N, instead of an inverted U (Alderson & Nielsen, 2002). Not only has income inequality been growing in the U.S. as a whole since the 1970s, it also has been growing at an increasing rate and also increasing within each population subgroup (Albrecht & Albrecht, 2007). The proponents of the economic restructuring view attribute the increased income inequality over the past several decades to the economic transformation from a dependence on manufacturing to a dependence on services. Thus the economy is in a constant flux of restructuring process that inevitably results in a constant change in inequality. This view arguably has a grain of truth since the transition that has taken place is characterized by the lost of most middle income manufacturing jobs compensated by new service jobs that have a large range of quality. Some service jobs no doubt are high paying ones that include medical doctors, lawyers, accountants, and dentists (Sassen, 1990), but many others are low skilled, temporary, often informal, and low paying jobs (Bhattacharya, 2011; Dobson & Ramlogan-Dobson, 2012). The loss of middle income manufacturing jobs that have been replaced by a small proportion of high income jobs and a greater proportion of low income jobs in the service sector inevitably produces greater inequality. Hence, a greater dependence on service sector is expected to be associated with greater income inequality.

On the social camp, scholars, mostly sociologists, argue that increased income inequality largely results from the changing social conditions, instead of economic restructuring (Chevan & Stokes, 2000; Morris & Western, 1999). These social conditions include, among others, the rate of participation in the labor force of men and women, the proportion of female-headed households, and the size of the minority population. In general men used to get more employed and earn relatively higher wages than women. Therefore, the recent changes that produced lower male employment rates or higher female employment rates likely bring about losses in high male incomes compensated by generally lower female incomes and, in turn, higher levels of inequality. This line of reasoning also applies for the increased proportion of female-headed households, and size of the minority population. The higher the prevalence of female-headed households and the size of minority population the higher income inequality tend to be.

Meanwhile it has been argued that the distribution of income is also a question of how the pie of national production is divided between rent, profit and wages. There are distributional conflicts between firms and shareholders on the one hand and wage and salary earners on the other. This also means a distributional conflict between retained profits, interests and dividends on the one side and wages on the other. Empirically Dünhaupt (2016) reports that the share of income of wage earners (labors) has been shrinking in most OECD countries since the mid 1980s until the Great Recession, while the share of profits has been increasing and much of the increase was determined by rising dividend and interest payments. This arguably is one of important reasons behind the increased inequality in recent decades.

Various studies have linked the phenomena of shrinking share of wage to technological change, globalization and weakening bargaining power of labors. The IMF (2007) for example argues that the revolution in the computers and information and communication technologies have driven unskilled labors out of marketplaces to be replaced by skilled labors. The formers inevitably have to be satisfied, if lucky enough, with low paying jobs or without jobs at all. This argument is complemented by the globalization thesis that relies on the Heckscher-Ohlin model and argues that due to global competitions countries tend to specialize in the areas where they have comparative advantage (Kanbur, 2015). Therefore, countries with abundant labors concentrate on labor-intensive production, while capital-rich countries rely on capital-intensive production. Consequently, labor in the former gains more than capital owners and capital

owners in the latter win over labor. Likewise, in theory, wage share likely increases in the former and decreases in the latter. However, globalization also exerts different effects on skilled and unskilled labors in the labor-rich countries with a consequence that in the long run wages of unskilled workers will fall and wages of skilled workers will rise.

However, the technological change view fails to explain the fact that countries with similar level of technology, such as Anglo-Saxon countries and Continental European countries, have been experiencing different magnitudes of labor's shares decline, with the former having lower decline than the latter (Kristal, 2010). Similarly, contradicting the globalization thesis, developing and emerging countries have been experiencing worse decline in the labor share of income since the 1990s than in advanced countries (International Institute for Labor, 2011). Owing to these drawbacks some scholars have turned to financialization to explain increased inequality that resulted from the decline in labour's share of income (Chen & Chen, 2012; Dünhaupt, 2012, 2016; Hein, 2015; Lin & Tomaskovic-Devey, 2013; Stockhammer, 2009, 2017; Van Arnum & Naples, 2013). One important manifestation of financialization is that profits are increasingly accumulated by means of finance that include dividends, capital gains, and interests, rather than trade, producing commodities, or nonfinancial services. Therefore, financialization is often measured using increased share in GDP of the financial sector, increased emphasis on current shareholder returns, and rising household debt (Stockhammer, 2017).

At least there are two possible mechanisms by which financialization might increase the income share of rentiers and reduce the labor's share of income. First, a shift in sectoral composition of the economy where financial sector claims increasingly higher share in national income than non-financial sector in the economy can lead to an overall lower labor' share of income if their respective shares in employment are different. In his study for the US, for example, Dünhaupt (2012), found that an important part of the downward trend of the US wage share was attributed to the increase in the share of financial corporations in value added, while their share in labor employment was lower than that of the non-financial sector.

Second, financialization has increased the share of rentier incomes for the economy as a whole that include corporate earnings that accrue to dividend, interest, and other rent payments and capital gains. Palley (2013) summarizes how it happens as follows. As we know Gross domestic product (GDP) is divided between the share of capital and that of labor, and financialization has led to increased capital's share and decreased labor's share. Labor's share is in turn broken down into non-managers' share and managers' share that includes salaries and other compensations, and financialization has seen an increase in managers' share and a decrease in nonmanagers' share. While capital's share can be broken down into profits and interest income, profits are in turn distributed to financial sector and non-financial sector. Not only has financialization seen increased share of capital and decreased share of labor, it also has witnessed changing composition of capital's share, with the share of interests increasing and that of profit falling. Furthermore, there has also been an increase in the financial sector's share of total profits and a decrease in the non-financial sector's share.

Research Method

This study employs a sample of 32 provinces (out of 34 provinces, excluding Kepulauan Riau and Kalimantan Utara) in Indonesia that spans from 2007 to 2013[1]. The time dimension of the data is yearly and quite limited by data availability of Gini coefficient on provincial level. Therefore, in total the province-year combinations make up 224 observations. All the data are taken from the website of Statistics Indonesia (www.bps.go.id). Since the number of provinces and years for each variable is uniform, we have a balanced panel. Some empirical studies on income inequality that rely on panel data employ a random effect (RE) model (Agnello & Sousa, 2012; Brady & Wallace, 2000). While RE models have the advantage of estimating both variations within as well as between provinces, fixed effect (FE) models can only estimate variation within provinces with the advantage of capturing unobserved effects and hence reducing omitted variable bias (Dünhaupt, 2016). Since the provinces included in the sample arguably have different levels of development as reflected in the per capita income and economic growth, including province fixed effects, enables us to control for province specific characteristics. Nonetheless, the selection of the panel data model is also aided by conducting Chow and Hausman tests.

To test the hypotheses we will estimate the income inequality equation of the following form:

[1] The exclusion of these two provinces is due data unavailability in the time span under study.

$$GINID_{it} = \beta_0 + \beta_1 ALFF_{it} + \beta_2 MQ_{it} + \beta_3 M_{it} + \beta_4 EGWS_{it} + \beta_5 CN_{it} + \beta_6 THR_{it} + \beta_7 TC_{it} + \beta_8 FREBS_{it} + \beta_9 S_{it} + \beta_{10} PR_{it} + \beta_{11} CP_{it} + \varepsilon_{it} \quad (1)$$

where *i* and *t* denote the province and year, respectively; $GINID_{it}$ is Gini coefficient; $ALFF_{it}$ is the share in Gross Regional Domestic Product (*GRDP*) of Agriculture, Livestock, Forestry and Fishery; MQ_{it} is the share in GRDP of Mining and Quarrying; M_{it} is the share in GRDP of Manufacturing; $EGWS_{it}$ is the share in GRDP of Electricity, Gas and Water Supply; CN_{it} is the share in GRDP of Construction; THR_{it} is the share in GRDP of Trade, Hotel and Restaurants; TC_{it} is the share in GRDP of Transport and Communication; $FREBS_{it}$ is the share in GRDP of Finance, Real Estate and Business Services; S_{it} is the share in GRDP of Services; PR_{it} is Poverty Rate or the percentage of people in absolute poverty in the population; CP_{it} is College Participation Rate (in percent); β_0 is constant; $\beta_1 \ldots \beta_{11}$ are coefficients on explanatory variables; and ε_{it} is the error term.

In terms of economic structure variables, the expected effects on income inequality might follow the inverted U pattern as suggested by Phillips or the N pattern as suggested by more recent researchers. The effect of the share in GRDP of Agriculture, Livestock, Forestry and Fishery (*ALFF*) on income inequality is expected to be positive with the assumption that the share of this sector in total employment is relatively small. The share in GDP of Manufacturing (*M*), in turn, is expected to have a negative effect on income inequality, assuming that its share in total employment is relatively large. If this turns out to be the case the economy can be said to be at the later stage of the inverted U pattern. If the opposite is the case the economy is on the earlier stage of the inverted U pattern or N pattern. As for industries in the service sector, the expected effects on income inequality might be positive, in which case N pattern is followed, or negative, in which case an M pattern emerges. While in the former the share in total employment of service sector is still limited and relatively very small, in the latter its share in total employment is already relatively large. As regards the financialization hypothesis, the effect of the share in GRDP of Finance, Real Estate and Business Services (*FREBS*) on income inequality, as suggested by the literature, is expected to be positive. If this turns out to be the case the financiaization hypothesis gains support. While the effect of college participation rate on income inequality is expected to be positive, as suggested in Van Arnum & Naples (2013), the absolute poverty rate might have ambiguous effects on income inequality. The lower the absolute poverty rate the lower the income inequality tends to be. But it might be the case that a lower absolute poverty rate is associated with a higher income inequality.

Results and Discussion

Based on both Chow test and Hausman test the choice of the model is in favor of the fixed effect model. Table 1 presents the results of both the FE and RM models estimation. In terms of the sign of the coefficient, the estimated two models differ in the coefficient of only two variables, namely *MQ* and *S*. However, the estimated FEM produces more statistically significant coefficients than the estimated REM, nine and seven out of twelve, respectively. Since based on the overall statistical indicators the estimated FEM provides better results, the discussion mostly relies on the FEM results.

Table 1. Estimation results

Variable	FEM		REM	
	Coefficient	Std. Error	Coefficient	Std. Error
C	0.421***	0.046	0.328***	0.031
ALFF	-0.356***	0.117	-0.017	0.052
MQ	0.055	0.055	-0.068*	0.039
M	0.053	0.050	0.085**	0.037
EGWS	2.074	2.624	0.109	0.746
CN	1.372***	0.531	0.243	0.153
THR	-0.307*	0.188	-0.263***	0.072
TC	1.033***	0.344	0.327*	0.185
FREBS	-1.644***	0.282	-0.132	0.107
S	-0.177***	0.065	0.002	0.044
PR	-0.004***	0.001	-0.002***	0.001
CP	0.003***	0.001	0.004***	0.001
[illegible]	0.775		0.356	
[illegible]	0.723		0.323	
F*test*	14.833***		10.699***	

Notes: ***, **, * indicate 1, 5, 10 percent of significant levels respectively.

Economic structure and income inequality

There are three explanatory variables: *MQ*, *M* and *EGWS* that do not have statistically significant effects on income distribution, although the signs of the coefficients on these three variables are as expected by the hypotheses. This may mean that the change in the share in gross regional domestic product (*GRDP*) of each of these three sectors (Mining and Quarrying; Manufacturing; and Electricity, gas and water supply) does not affect income distribution. These three sectors happen to belong to the same larger group, called industry sector. Collectively, their share in the total value added increased only by 5 percentage points from 41.72 percent in 1980 to 46.78 percent in 2012, while their share in total employment increased a slightly higher by 8.57 percentage points, from 13.10 percent to 21.67 percent during the same period. Since this sector controls nearly half of the total value added but contributes only 22 percent to the total employment, an increase in its share in GDP should have increased the level of income inequality. While the finding for *MQ* and *EGWS* sectors may be understandable because their share in the *GRDP* is quite small, as shown in Figure 5, it is quite questionable for *M* sector, since its share in the *GRDP* is comparatively the highest and its share in labor absorption tends to be small. Therefore, the increase in its share in the *GRDP* should have increased income inequality as indicated by the positive sign of the coefficient, which is the case if we use the result from the estimated REM. At least as long as the sign is concerned for *MQ*, *EGWS*, and *M* sectors or if the result from the REM for *M* sector is used, the result is in line with (Albrecht & Albrecht, 2007), although they found significant negative sign for manufacturing because they use the share in total employment of manufacturing. Further this result is more consistent with the early stage of the inverted U pattern of Kuznets (1955) and his later supporters (Lindert, 2000; Nielsen & Alderson, 1997) than the latter stage of N pattern. The industrialization process indicated by increased share of the industry sector in GDP is associated with increased income inequality. This is the case at early stage because a shift in the share in GDP from agriculture to industry is not smoothly followed by a shift in the share in total employment. Therefore, the estimated effect of agricultural sector (*ALFF*) should be negative in order to support this conclusion.

However, if the statistically not significant result for manufacturing sector turns out to be what is supported by what really happens on the ground, its share in total employment must have been comparatively large. This might be the case because the manufacturing sector in Indonesia largely adopts a labor-intensive technology. Therefore, it can be seen as a good sign in that the structural change from an agricultural-dominated economy to a manufacturing-dominated economy is not detrimental to income distribution. In fact, there is still one subsector of the industry sector, namely construction (*CN*) sector, which will be discussed later. The question then is where have the variety of income inequality levels across provinces and the increased inequality level over the last decade come from? The construction sector might be one of them.

The result for the remaining 8 explanatory variables show that each has a statistically significant effect on income distribution, with three of them having estimated signs of coefficients not as expected by the hypotheses. The share in *GRDP* of each of the following 5 sectors (*ALFF*, *CN*, *THR*, *TC*, and *S*) is found to have statistically significant effect on income distribution with the sign of coefficient as suggested by the hypotheses. First, an increased share in *GRDP* of *ALFF* sector that includes agriculture, livestock, forestry and fishery reduces income inequality. This is expected since, as shown in Table 2, this sector provided 35 percent of total employment, while creating only 14.50 percent of total value added in 2012. Hence, a smaller portion of value added should be shared by a larger portion of people. Accordingly, the larger is the share of this sector in *GRDP,* given its share in total employment, the lower the level of income inequality. This result as we have suggested above supports the early stage inverted U pattern. This finding may also mean that provinces with smaller share in *GRDP* for *ALFF* sector tend to have higher level of income inequality. Similarly, the fact that the share of *ALFF* sector in *GRDP* has declined overtime might have contributed to increased level of income inequality over the past decade. Therefore, if the level of income inequality is to decrease one of possible ways is by increasing the share in *GRDP* of this sector or decreasing its share in total employment across provinces and time.

Second, the share of construction (*CN*) sector in *GRDP* positively affects the level of income inequality. This sector is the only subsector in the industry sector with the share in *GRDP* having a statistically significant effect on income inequality as suggested by the hypothesis. Since at national level its share in *GDP* has constantly increased overtime from 5.51 percent in 2000 to 10.05 percent in 2014, its share in total employment should be disproportionately the smallest in the industry sector. This might imply that provinces with higher *GRDP* shares for construction sector tend to have higher level of inequality. There-

fore, one of possible ways to reduce the level of income inequality is not by reducing its share in *GRDP* but by increasing its share in total employment by absorbing more people across provinces and overtime. If this sector is taken as a subsector in the industry sector the result supports Kuznets (1955) and his later supporters (Lindert, 2000; Nielsen & Alderson, 1997). But if it is categorized as a subsector of service sector the result is more consistent with the N pattern (Alderson & Nielsen, 2002).

Third, as for the sector comprising trade, hotel and restaurant (*THR*), an increase in its share in *GRDP* tends to reduce the level of income inequality. Similarly the share in *GRDP* of service (*S*) sector also negatively affects the level of income inequality. At more aggregate level these two sectors belong to the same larger group, called Service sector (with capital S to distinguish it from the subsector service), that absorbed the highest portion of total employment, 43.24 percent, while creating 38.72 percent of total value added in the economy in 2012, as reported in Table 2. Arguably a great portion of that employment share must have been provided by the *THR* and *S* sectors, especially through informal activities in trade, food stalls, and family servants, so that the greater is their share in *GRDP* the lower the level of income inequality. Likewise, a more equal distribution of income may be attempted by increasing the share in *GRDP* of these two sectors across provinces and times. Looking at this share overtime, as seen in Figure 5, it has not changed much over the period 2000-2014 and as a result it is the variety across provinces that is likely more responsible for the level of income inequality. The prevalence of informal activities in these sectors is unique to developing countries such as Indonesia. As a result it is quite possible that the inverted U pattern or the N pattern, which were constructed based on the experience of advanced countries, has not been or will never actually be replicated in developing countries. If in advanced countries the shift in the share of total employment between the three main sectors is in order, first, from agriculture to manufacturing, and subsequently from manufacturing to service, in developing countries the shift arguably is more simultaneous. Hence, the stage of increased inequality of the inverted U turn will probably last quite long, besides that according to the experience of the U.S. this stage lasted more than 100 years.

Finally, although transport and communication (*TC*) sector also belongs to the Service sector, its share in *GRDP* has a positive effect on income inequality. The larger is its share in *GDRP* the higher the income inequality level. Figure 5 shows that its share in *GRDP* has steadily increased over the period 2000-2014, although not quite significant. It might be the case that its share in employment in the Service sector is disproportionately very small, since transport is quite capital intensive and communication jobs require specific skills. Therefore, in order to reduce income inequality its capacity to employ more people across provinces and time should be enhanced. The disruption of transport industry by swift emergence of online-based public transport, which is transforming from a company-based transport system to a broad-based sharing system, might likely be able to employ significantly more people than before. This, in turn, will likely improve the distribution of income.

Financialization and income inequality

The share in GRDP of the sector that includes finance, real estate and business services (*FREBS*) is found to have a negative and statistically significant effect on income inequality. This finding seems to be against the financialization hypothesis that argues that the increasing dominance of the financial sector in the economy tends to be detrimental to income distribution (Hein, 2015; Stockhammer, 2009). That is, the result suggests that the increasing share of this sector in GDP even improves income distribution. At least if the result from the REM is used, it has no effect on income distribution or financialization is absent. In particular, the result is not consistent with the result of Van Arnum & Naples (2013), because although they employ the same measure of financialization as in this research, the share in GDP of financial sector, their result supports the financialization hypothesis. One likely reason is that arguably the *FREBS* sector in Indonesia is still developing and far from dominant and, as shown in Figure 5, its share in *GDP* has been very small and declining over the last decade, from 8.31 percent in 2000 to just 7.65 percent of *GDP*. Further, its share in total employment might be relatively higher than its share in GDP, especially through better and wider access for the people to finance. Another likely reason is that since the share in GDP of financial sector is not the only measure of financialization, the variable currently used is not a good measure of financialization and therefore other variables suggested in the literature, such as the share in GDP of rentier income (interest and dividend payments and capital gains) are worth attempting. However, such variable is impossible to employ in the current research due to lack in data.

Alternatively, what is more relevant argument is probably the one that belongs to the financial inclusion hypothesis that says that the increased share of financial sector in GDP tends to be associated with

greater and wider accesses of the people to financial facilities and hence more business opportunities and in turn more equal distribution of income (Beck, Demirgüç-Kunt, & Levine, 2007; Demirgüç-Kunt, Levine, Demirgûç-Kunt1, & Levine2, 2009).

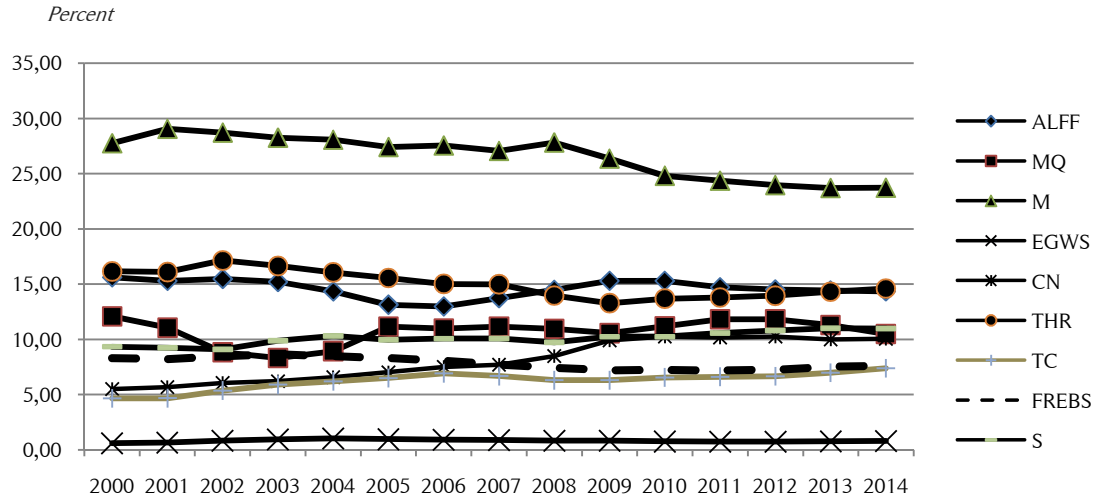


Figure 5. GDP share of each of 9 (nine) sectors in the economy

Social conditions and income inequality

The result for the poverty rate is against the commonly held hypothesis. Decreased poverty rate is expected to decrease income inequality. But the result suggests the opposite. Decreased poverty rate increases income inequality. It is quite possible that increased income inequality is associated with falling poverty rate if as a whole the proportion of population living under the poverty line declines due to a significant growth in per capita income and at the same time the larger proportion of the income growth is enjoyed by the top 20 percent of the population. Indeed over the last decade poverty rate has been steadily declining, while the income inequality level has been increasing. Therefore apparently reduced poverty rate increases income inequality. This might imply that increased per capita income across provinces and times have successfully reduced poverty rate but at the same time have increased income inequality. Therefore, policy measures specifically designed to reduce poverty does not necessarily reduce income inequality. There is no such thing as one fits for all.

The last explanatory variable is college participation rate (*CP*). The finding suggests that the higher the university participation rate the higher the income inequality level. This goes with the common wisdom and supports Van Arnum & Naples (2013). The college participation rate in this study employs the data of the university participation rate of the population between the age of 18 and 24 years. It is widely recognized that university education is costly and not many Indonesian people of that age category can afford it. It is suspected that those who enjoy university educations mostly come from middle and upper class families. Accordingly, the more of the youth from these families enrolled in university education the worse is the distribution of income. This is partly because they have higher probability of winning highly skilled job opportunities with better pays than those without university education.

Conclusion

Seven variables are found to have effects on income inequality. Although with expected signs, the *GRDP* shares of sectors that include Mining and Quarrying; Manufacturing; and Electricity, Gas and Water Supply, turns out to have no effect on income distribution. As expected an increase in the GRDP share of *ALFF* sector that includes agriculture, livestock, forestry, and fishery tends to reduce income inequality. This implies that provinces with smaller share in *GRDP* for *ALFF* sector tend to have higher level of income inequality, that declining trend in the share of *ALFF* overtime might have contributed to increased level of income inequality over the past decade, and if the level of income inequality is to decrease one of possible ways is by increasing the GDP share of this sector or decreasing its share in total employment across provinces and times. While the GRDP share of construction is found to positively affect income

inequality, the GRDP share of service sector that includes trade, hotel, and restaurant tends to negatively affects income inequality. As a result, a more equal distribution of income might be attempted by decreasing the former and increasing the latter across provinces and times. Further, it is found that the larger is the *GRDP* share of transport and communication the higher the income inequality, likely because of the job-saving nature of the sector. The online transport system revolution might likely affect the result. This study does not find support for the financialization hypothesis. Against the hypothesis, increased importance of financial sector tends to reduce income inequality. If the variable measuring financialization is correct, the result might be more consistent with the financial inclusion hypothesis. This study also finds that falling poverty increases inequality, implying that policy to reduce poverty might not be neutral for inequality and instead cannot prevent it from increasing. Since the higher the college participation rate the higher income inequality tends to be, it does not automatically imply that in order to reduce inequality we need to reduce the number of people who go to college. It might be the case that the college participation rate has not reached a turning point, below which its increase increases inequality, but beyond which its increases reduces inequality.

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