



WP/20/118

# IMF Working Paper

---

Determinants of Inclusive Growth in ASEAN

by Victoriia Alekhina and Giovanni Ganelli

***IMF Working Papers* describe research in progress by the author(s) and are published to elicit comments and to encourage debate.** The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

I N T E R N A T I O N A L M O N E T A R Y F U N D

**IMF Working Paper**

Asia and Pacific Department

**Determinants of Inclusive Growth in ASEAN**

**Prepared by Victoriia Alekhina and Giovanni Ganelli\***

July 2020

**This Working Paper should not be reported as representing views of the IMF.** The views expressed in this paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

**Abstract**

Over the past decades ASEAN countries have experienced rapid economic growth accompanied by a dramatic fall in poverty rates, but income inequality has not retreated. This research aims at identifying factors which could contribute to more equally distributed growth in ASEAN. To measure inclusive growth, we use a variable integrating per capita income growth and an equity index. A cross-country panel analysis of the impact of macro-structural factors on inclusive growth and its two components suggests that fiscal redistribution, female labor force participation, productivity growth, FDI inflows, digitalization, and savings significantly drive inclusive growth. A scenario analysis based on our econometric results suggests that the implementation of fiscal redistribution and labor market-oriented structural reforms could help significantly accelerate inclusive growth in ASEAN.

JEL Classification Numbers: D63, F43, O11, O47

Keywords: Inclusive growth, Inequality, Income distribution, Equity

Authors' E-mail Addresses: [VAlekhina@imf.org](mailto:VAlekhina@imf.org); [GGanelli@imf.org](mailto:GGanelli@imf.org).

---

\* We thank Nada Choueiri and numerous IMF colleagues for useful comments. Any errors are solely ours.

## I. Introduction

In opening chapter 24 of its *General Theory*, originally published in 1936, John Maynard Keynes famously argued that “*The outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes.*” At least since then, economists have been interested in the issue of inequality and its relationship with economic growth.

Kuznets (1955) hypothesized that economic development is necessarily accompanied by increasing inequality in its early stages, but inequality starts declining at a certain point after countries have reached higher levels of per capita growth. Interestingly, this pattern has changed over recent decades and increasing income inequality was documented not only in developing, but also in OECD countries (Keeley 2015; World Income Inequality Report 2018). At the same time, the academic and policy debates on inequality drivers and possible policies to treat it remain unsettled.

In contrast to earlier research suggesting that there might be a trade-off between “equality” and “efficiency” (Okun 1975), recent studies have shown that such tradeoff may not exist (Aghion et al. 1999; and Berg and Ostry 2011). Similarly, while some studies concluded that inequality is to some extent necessary for economic development given the role it plays in affecting incentives (Chaudhuri and Ravallion 2007), others have demonstrated that higher income equality positively affects growth duration and that, for growth to be sustainable in the long-run, it should be more equitable (Berg and Ostry 2011; Berg, Ostry, and Zettelmeyer, 2012; Ostry, Berg, and Tsangarides 2014).

Studies which emphasize the negative implications of inequality for growth have stressed that high and persistent income inequality can significantly impede growth, cause crises, and weaken demand (IMF 2015). An increasing concentration of income could reduce aggregate demand (Carvalho and Rezai 2015), since higher-income groups tend to spend a lower fraction of their incomes compared to middle- and lower-income ones. Furthermore, a disproportionate income concentration reduces the chances of households with lower income to accumulate capital, and to access education and healthcare (inequality of opportunity), which may lower the growth potential of the economy (Huang and Wan (2019)). In addition, high and rising levels of income inequality can lower the impact on poverty reduction of a given rate of growth, reduce the growth rate itself, and negatively affect political stability and social cohesion (Ali and Son 2007). It was also documented that countries with higher levels of income inequality tend to have lower levels of mobility between generations (Corak 2013).

The shift away from seeing equality as a threat to efficiency towards an understanding that the combination of equality and growth is possible, and might even be beneficial for growth itself, has created significant attention for the concept of *inclusive growth*. However, the economic literature on inclusive growth is still limited, and the definitions and measurements of this relatively new concept widely vary depending on the approach. For example, OECD

broadly defines inclusive growth as economic growth that is distributed fairly and creates opportunities for all.<sup>1</sup>

In this paper we aim at contributing to this debate by focusing on inclusive growth in ASEAN. In developing Asia inclusive growth has recently become a widely discussed concept, since the income gap has been widening despite the rapid economic growth and dramatic poverty reduction observed over recent decades. Zhuang, Kanbur, and Rhee (2014) highlighted that poverty reduction in developing Asia over the last two decades has happened faster than in any other region, but at the same time inequality has been growing in some developing Asian countries. Balakrishnan et al. (2013) also stressed that recent growth in Asia was less inclusive and less pro-poor compared to other regions and to Asia's past growth episodes. Aoyagi and Ganelli (2015) assess determinants of inclusive growth in Asia and discuss options for reforms, suggesting that the effect of fiscal redistribution on inclusive growth could be sizable in emerging Asia. Those studies suggest that, to further enhance growth and make it more sustainable, it is crucially important for developing Asia to focus not only on policies which support income per capita growth in itself, but also on policies which can narrow inequality.

This research is very timely, given the recent COVID-19 crisis which is likely to have a detrimental impact on both equality and growth. According to Furceri et al. (2020)<sup>2</sup> this century's major epidemics have contributed to income inequality and lowered the share of income going to the bottom deciles, hurting the employment opportunities of people with low educational attainment, while scarcely affecting those with advanced degrees. They suggest that the COVID-19 pandemic could have similar consequences unless the policy response effectively tackles inequality. In addition, the COVID-19 crisis exposed the digital divide, which is another type of inequality that intensifies income inequality. The intuition is straightforward, those who have access to digital infrastructure are able to continue working and studying remotely, in contrast to those who have limited to no access. The COVID-19 crisis therefore strengthens the case for aggressively proceeding with necessary structural reform plans in ASEAN in order to support inclusive growth.

In the ASEAN countries on which we focus in this paper, rapid GDP growth has surpassed average growth in emerging markets and developing economies, as well as the world's average growth (IMF 2018b). Such steady growth of income, however, failed to generate more equal income distribution during recent decades, indicating the importance of government policies aimed at fostering inclusive growth. The main question we address in this paper is what are the policies that could help ASEAN countries foster both higher growth and greater equality. The measure of inclusive growth that we use is based on Anand et al. (2013) and integrates per capita income growth and the change in income distribution into a unified indicator of inclusive growth. Compared to the existing literature where this measure

---

<sup>1</sup> <https://www.oecd.org/inclusive-growth/#introduction>

<sup>2</sup>The paper is summarized at <https://voxeu.org/article/covid-19-will-raise-inequality-if-past-pandemics-are-guide>

was used (for example Aoyagi and Ganelli 2015; Anand et al. 2013; Aoyagi et al. 2015) the novel contribution of our research is multifold.

First, we focus on the most recent economic developments, poverty, and inequality trends in selected ASEAN countries and on their reform plans aimed at fostering inclusive growth. Second, we empirically estimate inclusive growth drivers, modeling not only monetary and fiscal determinants but also structural (such as labor market, productivity, digitalization, FDI) policies based on ASEAN countries' reform plans to foster equitable growth. In addition, we decompose inclusive growth into equity index growth and GDP per capita growth to analyze whether inclusive growth is income or equality driven. Finally, we build a scenario analysis to estimate how achieving different structural reform targets could potentially contribute to inclusive growth in ASEAN countries.

The research presented in this paper suggests that higher fiscal redistribution, higher female labor force participation, labor productivity growth, FDI inflows, digitalization, and aggregate saving levels significantly and positively contribute to inclusive growth through GDP per capita growth or equity index growth (or through both). The results of our scenario analysis suggest that the implementation of fiscal and labor market-oriented structural reforms could have a sizable impact on inclusive growth in ASEAN. Our findings are broadly in line with previous literature on this topic, for instance, ADB (2016) highlights that progressing with structural reforms is key to boost the region's potential growth, suggesting that structural reforms (particularly policies that close the gaps with global best practices in tertiary education, labor market flexibility, institutional quality, trade openness, and financial integration) could contribute by nearly 1 percentage point annually to developing Asia's potential growth over the next ten years.

The rest of this paper is structured as follows: in Section II we discuss trends in poverty, inequality and inclusive growth in selected ASEAN countries. Section III summarizes the definition and concepts of inclusive growth in the literature and explains more in detail the measure of inclusive growth used in the paper. Section IV presents the methodology, model and empirical results. In Section V we present a scenario analysis aimed at an evaluation of structural reforms in ASEAN countries based on our empirical results. Section VI concludes the paper.<sup>3</sup>

## **II. Poverty, Inequality and Inclusive Growth in Asia**

### **A. Poverty**

Poverty has declined significantly world-wide during the last two decades and its reduction has been especially remarkable in Asia. In the East Asia and Pacific region, the poverty headcount ratio at \$1.9/day in 2011 PPP went from 53.7 percent in 1993 to 3.6 percent in 2013 (Table 1). As stated in Zhuang, Kanbur, and Rhee (2014) and in Aoyagi and Ganelli

---

<sup>3</sup> While our regression analysis is based on a wider sample of Asian countries, the descriptive analysis of ASEAN trends presented in next section focuses on Indonesia, Malaysia, Philippines, Thailand, and Vietnam. The choice of both country groups is dictated by data availability.

(2015), the progress in poverty reduction in developing Asia was faster than in any other region, at any other time in recorded history.

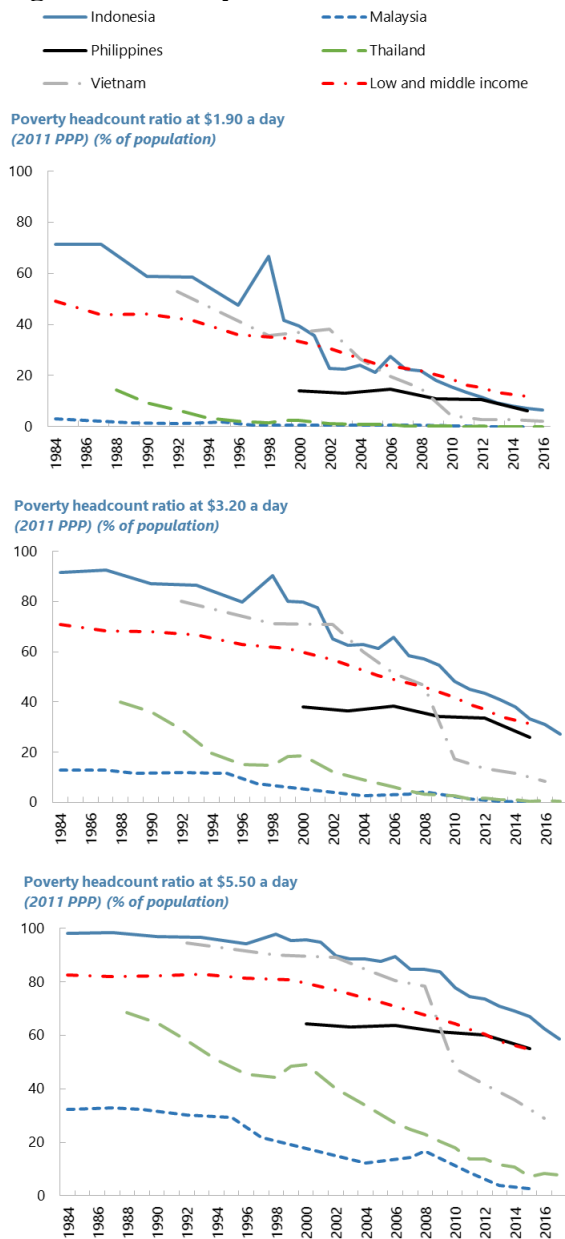
**Table 1. Extreme poverty headcount ratio (\$1.9/day poverty line).**  
Headcount, in percent

Region	Headcount, in percent	
	1993	2013
East Asia and Pacific	53.7	3.6
South Asia	44.9	16.1
Sub-Saharan Africa	59.7	42.4
Latin America and the Caribbean	14.0	4.6
Middle East and North Africa	7.0	2.6
Europe and Central Asia	5.2	1.6
World Total	34.0	11.2

Source: World Bank, PovcalNet. Note: The headcount ratio is the percentage of the of population living in households with consumption or income per person below the poverty line and is based on the average monthly household per capita income or consumption expenditure from the survey in 2011 PPP.

China has contributed the most to the poverty decline in East Asia and Pacific by lifting about 642 million people out of extreme poverty, with the poverty headcount ratio at \$1.9/day declining from 56.6 percent to 1.9 percent between 1993 and 2013 (compared to a total decline of about 826 million of people in East Asia and Pacific between 1993 and 2013). Notable progress has been also achieved in ASEAN countries, where poverty has been sharply declining and, as a result, the percentage of population living on \$1.9/day has fallen below the low- and middle-income countries' average (Figure 1).

**Figure 1. Poverty headcount ratios<sup>4</sup> in selected ASEAN countries.**



Source: World Bank, PovcalNet. Note: Based on data availability and contains missing data points.

Poverty has declined faster in countries that have started with higher poverty headcount ratios. For example, Vietnam's extreme poverty headcount ratio declined from 53 percent in 1992 to 2 percent, while in Indonesia the decline was from 58.5 percent in 1993 to

<sup>4</sup> The World Bank defines poverty headcount ratio at \$1.90 per day (2011 PPP) as extreme poverty, while poverty headcount ratios at \$3.20 and \$5.50 (2011 PPP) represent World Bank's lower middle-income and upper middle-income country poverty lines respectively. Depending on the level of economic development, some countries have low extreme poverty rates, hence, all three ratios are presented on this chart. For more details see <https://www.worldbank.org/en/topic/poverty/lac-equity-lab1/poverty>.

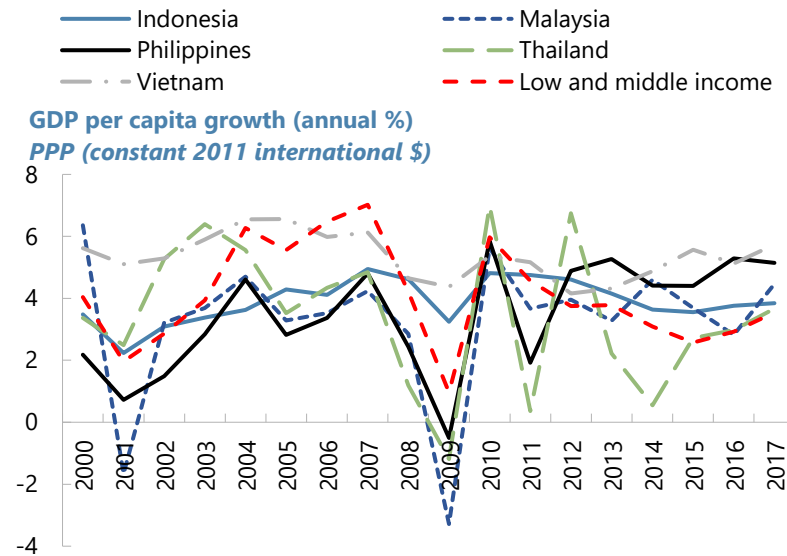
6.5 percent in 2016. On the other hand, the Philippines saw a less marked poverty declining speed, from 13.9 percent in 2000 to 6.1 percent in 2015.

Despite the comparatively small percentage of people living below the extreme poverty line of \$1.90 a day, less extreme poverty headcount ratios at \$3.2 and \$5.5 levels remain relatively high in some ASEAN countries. For instance, Indonesia and Philippines have poverty headcount ratios at the \$3.2 and \$5.5 per day lines higher than the average of low- and middle-income countries. Nearly 33 percent of the population were living below \$3.20 per day and more than 60 percent were living below \$5.50 per day respectively in Indonesia and Philippines in 2015. It should also be noted that, despite overall progress in reducing poverty, around 33 million of people were still living below the \$1.90 per day extreme poverty line in ASEAN<sup>5</sup> in 2015.

## B. Income Inequality

Accompanying the dramatic decline of poverty headcount ratios, GDP per capita growth in ASEAN has been sustained and positive in the last two decades, except for two episodes in the aftermath of the Asian crisis and global financial crisis in the early 2000s and in 2009 respectively. In most recent years, GDP per capita growth in some ASEAN was exceeding the low- and middle-income countries average (Figure 2).

**Figure 2. GDP per capita growth in selected ASEAN countries.**



Data Source: World Bank.

Despite the steady income per capita growth and dramatic poverty reduction enjoyed by ASEAN countries, they have also experienced a significant increase in income inequality in recent decades. Balakrishnan et al. (2013) and Aoyagi and Ganelli (2015) showed that the increase in inequality as measured by the Gini index in Asia in the last two decades was

<sup>5</sup> Based on available data for Indonesia, Lao, Malaysia, Myanmar, Philippines, Thailand, Vietnam. Data source: PovcalNet.



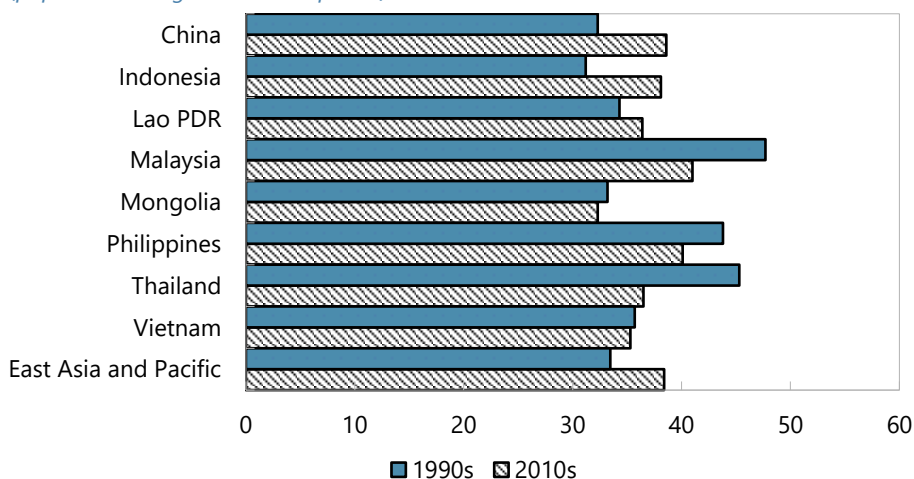
worse than in other emerging markets. Aoyagi and Ganelli (2015) and Huang and Wan (2019) observed that, although the Gini coefficients in developing Asia are on average lower (i.e. they indicate a more equal income distribution) than those observed in sub-Saharan Africa, Latin America, and the Caribbean, developing Asia has experienced a higher growth rate of inequality compared to those other regions.<sup>6</sup> Huang and Wan (2019) highlighted that about half of the Asian economies, covering around 80 percent of the region's population, have experienced worsening income distribution as measured by the Gini index in the past two decades.

Figure 3 presents the change in Gini indexes for selected developing Asian countries from the 1990s to the most recently available data point, compared to a regional aggregate population-weighted measure. Notable progress in achieving more equal income distribution is observed in Malaysia, Philippines, and Thailand, while in China, Indonesia, and Lao PDR equality has worsened. Although in Indonesia Gini coefficient increased between early 1990s and 2013, it declined through 2017 and this trend is expected to continue (Doumbia and Kinda 2019). In addition, income inequality in Indonesia remains in line with the levels in other major Asian emerging economies.<sup>7</sup> For Mongolia and Vietnam the Gini index shows only a slight improvement. As a result, the population-weighted average of the Gini index in developing East Asia and Pacific has increased from 33.5 percent in the 1990s to 38.4 percent in the 2010s.

**Figure 3. Change in Gini Index in developing East Asia and Pacific.**

**Income inequality in developing Asia**

*(population-weighted, in Gini points)*



Data Source: World Bank, authors' calculation (regional aggregate) based on available data for Asian countries.

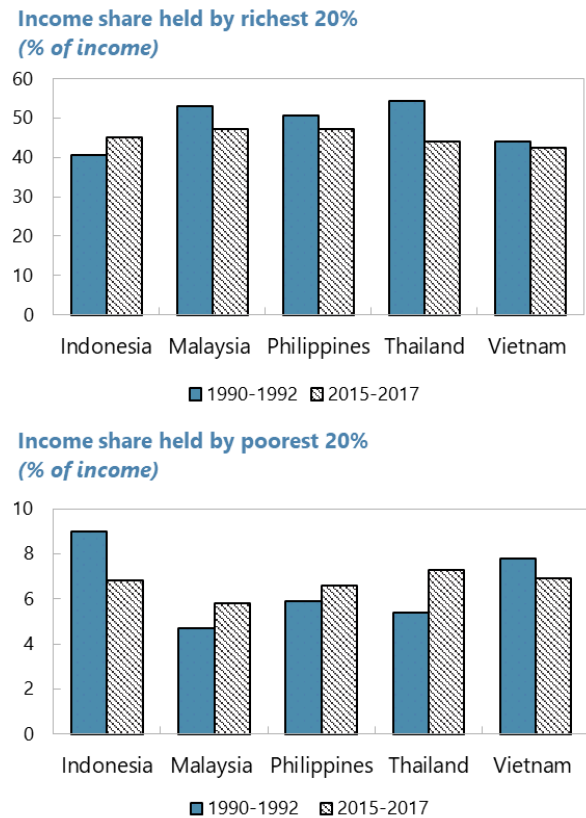
<sup>6</sup> A Gini index of 0 represents perfect equality, while an index of 100 represents perfect inequality.

<sup>7</sup> See Doumbia and Kinda (2019) for the case study on tackling inequality in Indonesia.

Figure 4 shows changes in income distributions in ASEAN, comparing the income share held by the richest and poorest 20 percent. Clearly, the income share held by the top 20 percent has not changed much over past decades and is exceeding 40 percent in Indonesia, Malaysia, Philippines, Thailand and Vietnam. While there was a notable decline in this share in Malaysia, Philippines, and Thailand; in Indonesia the share of the top 20 percent group has been higher in recent years than in the 1990s. Similarly, while in Malaysia, Philippines, and Thailand the bottom 20 percent group has recently received a higher income share than in the 1990s, in Indonesia and Vietnam the income share held by the bottom 20 percent has declined since 1990s.

Nevertheless, the developments reported show the importance of looking at inequality and growth issues in a unified way in ASEAN. This is consistent with the results by Ostry et al. (2014), who found that inequality is a robust determinant of the pace and duration of growth, and the reduction in inequality is associated with higher and more durable growth. In addition, IMF (2015) found an inverse relationship between the income share held by the top 20 percent group and economic growth. Specifically, the study found that an increase in the income share of the top 20 percent by 1 percentage point is associated with a 0.08 percentage point decline in GDP growth in the following 5 years. On the other hand, an increase in the income share of the bottom 20 percent by 1 percentage point is associated with a 0.38 percentage point increase in GDP growth in the following 5 years.

**Figure 4. Income distribution in ASEAN.**



Data Source: World Bank, PovcalNet. Note: The percentage share of income is the share that accrues to subgroups of population indicated by quintiles. Total consumption expenditure is used to estimate the income share for Indonesia, Philippines, Thailand, Vietnam. Disposable income is used to calculate the income share for Malaysia.

At the same time, social spending is relatively low in Asia, partly reflecting lower revenue collection, and, among other factors, insufficient and poorly targeted social policies are highlighted as bottlenecks to reduce inequality in Asia (see more details on inequality in Asia in Chandra et al. 2016).

### III. Inclusive Growth: Definitions and Concepts

The literature on inclusive growth is still relatively limited. Moreover, definitions, concepts and approaches to measure the degree of inclusiveness vary depending on whether they are based on monetary (e.g. poverty or income inequality) or non-monetary (inequality of opportunities) criteria. For example, Ali and Son (2007) consider growth as inclusive if it increases a social opportunity function, which depends on average opportunities available to the population and on how those opportunities are shared among the population. Ravallion and Chen (2003) consider the “absolute pro-poor growth” concept, under which growth is considered as inclusive as long as poor individuals benefit in absolute terms. On the other hand, Dollar and Kraay (2002) use the “relative pro-poor growth” approach, in which growth is defined as inclusive when the income of poor people grows relatively faster than the average income of the population.

Our definition of inclusive growth is based on Anand et al. (2013), who develop a unifying concept of inclusive growth integrating income distribution and income per capita growth into a single indicator, which is in line with the absolute definition of pro-poor growth and takes into account both the pace and the distribution of growth. Their measure of inclusive growth is based on the macro social mobility function and for growth to be inclusive it requires i) an increase in average income through growth or ii) an increase in the income equality, or a combination of both.

As proposed in Ali and Son (2007) and further developed in Anand et al. (2013), one way to illustrate inclusive growth is to derive a social opportunity function (similar to the social welfare function) and to plot a so-called social mobility curve (or indifference curve), which represents average income per capita on the vertical axis, against the cumulative share of population in the horizontal axis. The latter is expressed in quantiles in ascending order of income with the leftmost representing the poorest 20 percent and the rightmost representing the richest 20 percent of the population. Intuitively, if we plot such an indifference curve for different years, an upward shift represents an increase in the average income for all income groups, while the slope of the curve represents income distribution.

Figure 5 shows cumulative average GDP per capita per population quintiles for ASEAN countries for 1990-1993 and 2015-2017. Eyeballing figure 5 we can conclude that growth in all five countries was broadly speaking inclusive according to the definition used in this paper, since indifference curves have shifted upwards at all points. On the other hand, the figure also shows that income growth was not equally shared between income quintiles, given larger changes in GDP per capita for the top quintiles compared to the bottom

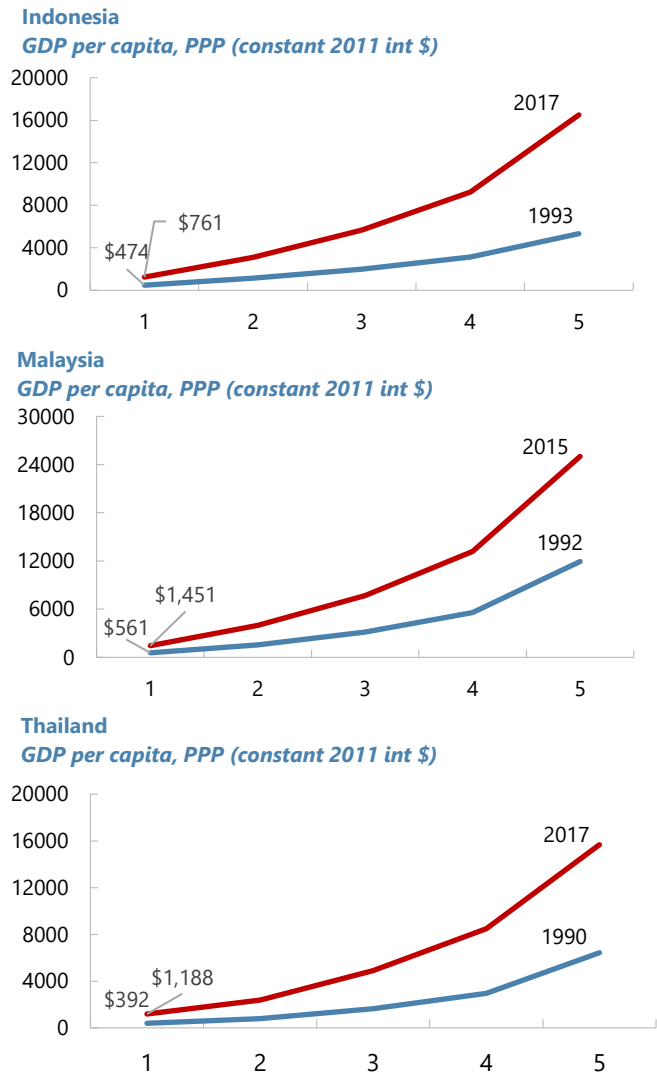
quintiles. The latter is true for all countries presented in Figure 5, with Indonesia and Vietnam standing out most, while Philippines and Thailand have done relatively better in terms of equitable growth, as manifested in less steep indifference curves. This visual evidence suggest that ASEAN countries could do better in terms of making growth more inclusive. This could be achieved by higher GDP per capita growth, higher equity, or a combination of both.

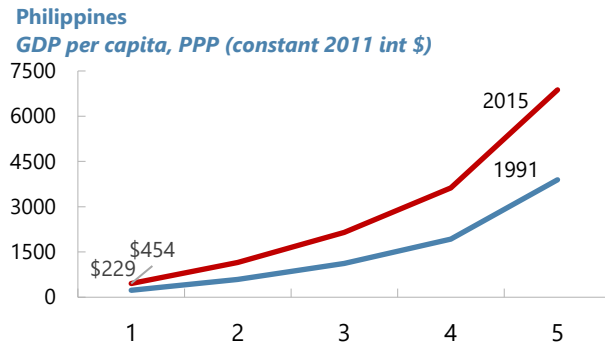
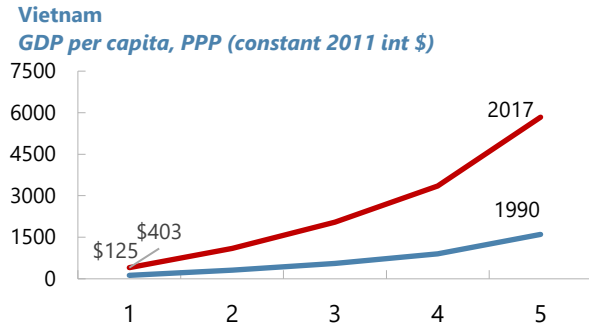
It is noteworthy that there are cases of less intuitive inclusive growth. Obviously, growth achieved through increases in both GDP per capita growth and equity growth is unambiguously inclusive (in contrast, if the growth of both components is negative, total growth is unambiguously non-inclusive). However, there are also cases in which inclusive growth is achieved at the expense of equality reduction through the larger increase in per capita income (per capita income growth should be higher than negative growth of equity). Similarly, in some cases higher equity might be achieved at the cost of average income contraction (when the percentage decline in income per capita is lower than the equity growth).<sup>8</sup>

---

<sup>8</sup> See inclusiveness matrix in Anand et al. (2013) for more details.

**Figure 5. Average GDP per capita per population quintiles in ASEAN.**





Note; Population income by quintiles in ascending order from 1 to 5. Source: Authors' Calculations based on World Bank PovcalNet data.

The evidence presented in this section highlights the importance for ASEAN countries of well-balanced policies aimed at achieving more equal distribution of income and at boosting growth simultaneously. In the next section we review the factors determining inclusive growth and present our empirical strategy and estimation results.

#### IV. Empirical Analysis of Inclusive Growth Determinants in ASEAN

##### A. Inclusive Growth Determinants

Despite the recent significant attention to the concept of inclusive growth, the literature on its determinants and possible policies to foster it remains limited. A number of studies has specifically focused on fiscal redistribution as a tool to equalize income through taxes and transfers. Earlier research has emphasized the tradeoff between “equality” and “efficiency” (Okun 1975) and, in this light, policies to improve equality via taxes have been long seen as dampening incentives to work and to invest, leading to declining economic activity. On the other hand, recent studies have suggested that well-designed fiscal redistribution policies could benefit the poor and foster growth through a number of channels, including improving human capital, health, infrastructure, and education (Benabou 2000; Garcia-Penalosa and Turnovsky 2007; Ostry et al. 2014; Aoyagi and Ganelli 2015).

Previous research suggest that monetary policy might have an impact on inclusive growth. Albanesi (2007) suggests that high inflation widens the gap between rich and poor, since the poor have little choice other than reducing their consumption during period of high inflation and/or unemployment. In this regard, monetary policy aiming at macro-stability can reduce

income inequality by reducing inflation and minimizing output volatility, thus leading to improved conditions for the poor (Romer and Romer 1998; Aoyagi and Ganelli 2015).

A few studies have also focused on the impact of macro-structural reforms on growth inclusiveness. Zhuang et al. (2014) have highlighted that technological progress, globalization and market-oriented reforms have increased inequality in developing Asia while driving economic growth. Balakrishnan et al. (2013) suggest that recent economic growth in Asia has been less inclusive and less pro-poor despite decline falling poverty rate. According to them, fiscal policies targeting health, education, as well as labor market reforms and a more inclusive financial system can indeed broaden benefits of growth in Asia. Jain-Chandra et al. (2016) found that promoting structural reforms in Asia—such as broader access to education, health, and financial services—could have a substantial effect on reducing inequality.

In the remainder of this section, we report our contribution to the empirical analysis of the determinants of inclusive growth. We draw on the existing literature and extend it by considering structural inclusive growth drivers in addition to monetary and fiscal drivers. Two novel structural drivers of inclusive growth that we include in our analysis are female labor force participation (FLFP) and financial inclusion led by digitalization (proxied by the number of mobile cellular subscriptions per 100 people).

IMF (2019) has stressed that if women’s employment equaled men’s, economies would be more resilient and economic growth will be higher. However, female labor force participation in some ASEAN countries is much lower than the average for East Asia and Pacific. According to ILO estimates, in 2017 the ratio of female to male labor force participation rate stood at 63.5 percent in Indonesia, 65.5 percent in Malaysia, 61.5 percent in the Philippines, 78 percent in Thailand, and 88 percent in Vietnam, while the average ratio for East Asia and Pacific stood at 77.7 percent in 2017.<sup>9</sup>

The intuition for including digitalization is in line with IMF (2018a), which highlighted a positive association between GDP per capita and an index of usage of digitalization that includes six different indicators. Although Asia is experiencing rapid digitalization (IMF 2018), bank account ownership remains comparatively low in some Asian countries.<sup>10</sup> In this context, mobile devices can serve as a useful mean of money transfer (Figure 6), hence, we use this variable as a proxy for financial inclusion.<sup>11</sup>

---

<sup>9</sup> The ratio of female to male labor force participation rate is calculated by dividing the female labor force participation rate (percentage share of female who participate in the labor force in total working-age female population aged 15 and older) by the male labor force participation rate and multiplying by 100. International Labour Organization, ILOSTAT database.

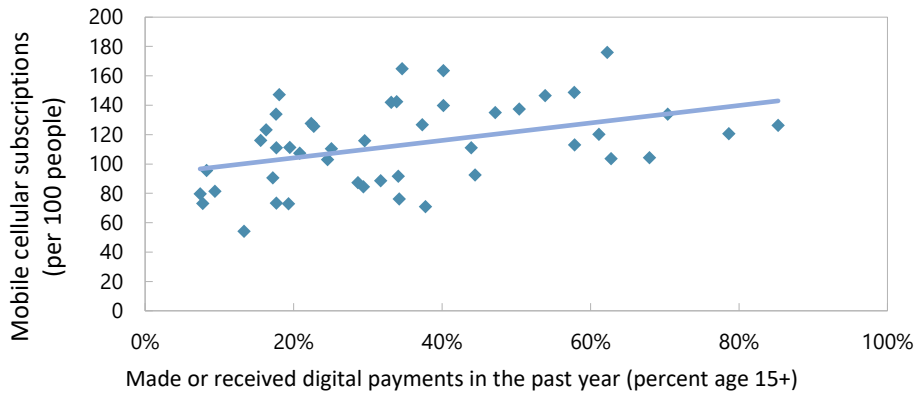
<sup>10</sup> Global Findex Database by World Bank.

<sup>11</sup> In the Philippines, the authorities tried to tap available facilities to pursue financial inclusion using digitalized solutions by easing know-your-customer requirements to be able to distribute assistance such as payment of benefits targeted to the vulnerable. The Bangko Sentral ng Pilipinas continues to leverage on emerging digital innovations (e.g., use of blockchain technology, fintech, and mobile payments) to promote a more efficient and

Another contribution of this research is that, we decompose our inclusive growth indicator into two components – income growth and equity growth - to analyze transmission channels of inclusive growth drivers. Finally, we apply our empirical results to scenario analysis of ASEAN countries’ reform plans.

**Figure 6. Digital payments and mobile subscriptions in developing countries.**

**Digital transactions in developing countries**



Note: Solid line is a linear trendline. Data Source: Global Findex Database 2017 by World Bank and International Telecommunication Union.

## B. Cross-Country Panel Model and Variables

To analyze the impact of monetary, fiscal and macro-structural reforms on inclusive growth in ASEAN we employ a standard empirical panel cross-country regression model. Our regression sample includes eleven Asian countries, of which six are ASEAN members: Indonesia, Malaysia, Philippines, Lao PDR, Thailand, and Vietnam. Other countries in the panel are Bangladesh, China, India, Mongolia, and Sri Lanka.<sup>12</sup> The period covered is 1992 to 2017.

Our dependent variable is the measure of inclusive growth used by Anand et al. (2013), which integrates average income per capita growth and the equity index growth. In other words, we define inclusive growth as income growth adjusted for an equity component.<sup>13</sup> The equity index is based on estimates of income distribution based on the PovcalNet database (the official online repository of World Bank poverty data).<sup>14</sup> The available income measure

---

inclusive financial system. Also, various digital platforms have empowered more Filipinos, including women, to become self-earning entrepreneurs.

<sup>12</sup> The country choice was dictated by data availability.

<sup>13</sup> Since country data for income distribution are not available for each year, to construct the equity index we calculated missing values using the linear interpolation method.

<sup>14</sup> The countries in the PovcalNet database that use incomes as a measure of welfare are mostly high-income countries and Latin America and Caribbean countries. 75 percent of the countries in the Bank PovcalNet database use per capita consumption as a welfare aggregate (World Bank 2016).



is based on net disposable income only for Malaysia, for other countries in our sample total per capita consumption expenditure data was used to approximate income, according to PovcalNet. Both measures are “net” in their nature and include public and private transfers.

As in Anand et al. (2013), our measure of inclusive growth ( $\Delta\bar{y}^*$ ) can be interpreted as a real income per capita growth ( $\Delta\bar{y}$ ) adjusted for the change in the equity index ( $\Delta\omega$ ).<sup>15</sup> This implies that inclusive growth  $\Delta\bar{y}^*$  is equivalent to per capita income growth  $\Delta\bar{y}$  if the income distribution is unchanged. When the distribution becomes more equal (unequal)  $\Delta\bar{y}^*$  shifts upwards (downwards). Under this definition, an increase in inclusive growth requires i) an increase in per capita income growth and ii) an increase in equity growth or a combination of both.<sup>16</sup>

Our proxy of inclusive growth is regressed on a set of monetary, fiscal and macro-structural variables which may potentially impact inclusive growth as discussed above. Our regressors include: the CPI inflation rate; fiscal redistribution, defined as the difference between market Gini and net (after tax) Gini<sup>17</sup>; female labor force participation (FLFP), defined as a percentage share of females who participate in the labor force as a share of total female population (age 15 and older); productivity growth (GDP per person employed); net FDI inflows as percentage of GDP; credit to private sector by banks in percent of GDP ratio, which is an indicator of financial deepening; the savings ratio, which is equal to net national savings as a percentage of GNI; an indicator aimed at capturing the positive impact of digitalization on financial inclusion, defined as the growth rate of mobile cellular subscriptions per 100 people.<sup>18</sup> In our regression analysis we control for country and time fixed effects.

Our empirical cross-country model is specified as follows:

$$\Delta\bar{y}_{i,t}^* = \beta_0 + \beta_1\bar{y}_{i,t} + \beta_2 x_{i,t} + u_i + \gamma_t + v_{i,t} \quad (1)$$

Where the dependent variable is the proxy of inclusive growth<sup>19</sup>  $\Delta\bar{y}_{i,t}^*$  in country  $i$  at time  $t$ .  $\bar{y}_{i,t}$  is the initial level of per capita PPP-adjusted income (log),  $x_{i,t}$  is the set of monetary, fiscal and structural determinants of inclusive growth described above over period  $t$ .  $u_i$  is a time-invariant unobserved country-specific effect,  $\gamma_t$  is an unobserved period effect that is

---

<sup>15</sup> The equity index  $\omega$  is the integral of the area under the Social Mobility Curve (Figure 5) and is scaled between 0 and 1 (1 is perfectly equitable income distribution) and  $\omega = \Delta\bar{y}^* / \Delta\bar{y}$ . See the technical note in Appendix A.

<sup>16</sup> See technical details in Appendix A.

<sup>17</sup> Based on the method used by Ostry et al. (2014), Aoyagi and Ganelli (2015).

<sup>18</sup> More details on variables, data sources, definitions are provided in Appendix B.

<sup>19</sup> See Kakwani (1980), Ali and Son (2007), Anand et al. (2013), Aoyagi and Ganelli (2015) for further information.

common across countries.  $v_{i,t}$  are errors, *i. i. d.*, that vary across countries  $i$  and time  $t$ . In the next subsection we empirically analyze the model and discuss the results.

In addition to assessing the impact of the regressors on the inclusive growth measure  $\Delta\bar{y}^*$ , we also decompose our dependent variable into the income per capita component  $\Delta\bar{y}$  and the equity index component  $\Delta\omega$ . This allows us to analyze the impact of the regressors on both components of inclusive growth to clarify whether they affect inclusive growth through the growth of income per capita or by improvements in equality.

Important limitations of our research should be noted. First, as we already discussed above, the availability of income distribution data for developing Asia is limited and, for most of the countries in our sample, income distribution data reflects the distribution of consumption expenditure and not income itself. As explained in World Bank (2016), income-based measures of welfare indicate the potential set of goods and services that could be purchased by a household or an individual. On the other hand, consumption-based measures indicate the purchased amount of goods and services, meaning that consumption-based measures do not capture opportunities but rather realized outcomes.

According to World Bank (2016), there is also incomplete coverage of household surveys among top earners because of inadequately reported entrepreneurial and capital incomes. This might be problematic in inequality analysis as it underestimates the living conditions of the rich. In short, inequality of consumption might not be perfectly correlated with income inequality (consumption-based measure might deviate from that of net disposable income depending on households' savings). Moreover, income is more volatile while consumption is much smoother (there are cases in which households declare zero income but positive consumption due to dissaving or to incorrectly measured consumption of home-produced goods<sup>20</sup>) which, according to the World Bank (2016), makes consumption-based welfare a preferred aggregate in measuring poverty (where agriculture and informal sector play an important role).

It is important to note that the inequality captured by consumption data might be less wide than that captured by income data. For example, consumption-based measures might suggest a decline in inequality if low-income groups consume more, but inequality might still be widening if measured based on income, in cases in which the income of higher-income groups increases as well and they save it rather than consuming it. Although the use of different variables to measure inequality may complicate the interpretation of the empirical results, since our inequality measure is predominantly based on consumption distribution<sup>21</sup>, it is likely that the degree of inequality remains underestimated, given that consumption tends to be smoother than income.

---

<sup>20</sup> See more about income and consumption welfare aggregates in World Bank (2016), Box 1.1.

<sup>21</sup> Consumption-based inequality measure is used for all countries in our data sample except for Malaysia, where income-based inequality measure is used.

A second limitation of our research is that we are unable to include several potentially significant inclusive growth drivers due to limited data availability in terms of time span. Those include measures of accessibility to and quality of education, quality of overall infrastructure, accessibility to healthcare, financial inclusion, fintech, and other indicators. Investigating the possible impacts of such factors on inclusive growth if longer time series become available is a promising avenue for future research.

Our empirical analysis is potentially subject to endogeneity, which could be caused by reverse causality between our dependent variable (inclusive growth) and our regressors, as well as by omitted variables which might be correlated with variables included in the model. For the first case, potential variables which may cause reverse causality in the model are inclusive growth and the inflation rate. Although we expect that relatively lower inflation will positively contribute to inclusive growth, these relationships need to be empirically tested for endogeneity, otherwise endogeneity in fixed-effect estimation may produce inconsistent results. A possible way to detect reverse causality<sup>22</sup> is by using Arellano–Bond estimator regression with instrumental variables. The results of the Arellano-Bond dynamic panel-data estimation and the panel regression excluding the inflation rate are both consistent with our main empirical results (Table 2) and are presented in Appendix, Table 1. Another way to test for endogeneity bias is to exclude suspect variables. In our case, even when we exclude the inflation rate, the results are consistent with our benchmark model (Appendix, Table 2). For the second case, which is endogeneity caused by omitted variable, the lagged dependent variable was included into the regression to capture unobserved effect (Appendix, Table 3), and the results are in accordance with our benchmark model (presented in Table 2).

### C. Empirical Results

Table 2 present the results of our regressions for our preferred model. It shows that fiscal redistribution has a significant impact on inclusive growth, both through per capita income growth and equity growth. This result is consistent with the findings of Ostry et al. (2013), who found that the combined direct and indirect effects of redistribution are on average pro-growth, and with those of Aoyagi and Ganelli (2015), who estimated that the redistribution impact on inclusive growth could be sizable in emerging Asia. Table 2 indicates that redistributive policies (implying an increase of 1 point in the difference between market and net Gini) in developing Asia can boost per capita growth by about 0.4 percent and improve equity by almost 0.3 percent at the same time.

Although positively contributing to inclusive growth, the Gini-based redistribution measure remains low in ASEAN (Figure 6). As mentioned in Aoyagi and Ganelli (2015), policymakers in Asia have traditionally used macroeconomic policy to support growth, rather than to redistribute income. Aoyagi and Ganelli (2015) also highlight that although fiscal redistribution is associated with inclusive growth, there could be cases in which some redistributive policies might actually hurt growth. Thus, it is important for policy makers to focus on those fiscal policy instruments which will have the least negative efficiency impact. Our results confirm their finding. In addition, we show that redistribution is beneficial for

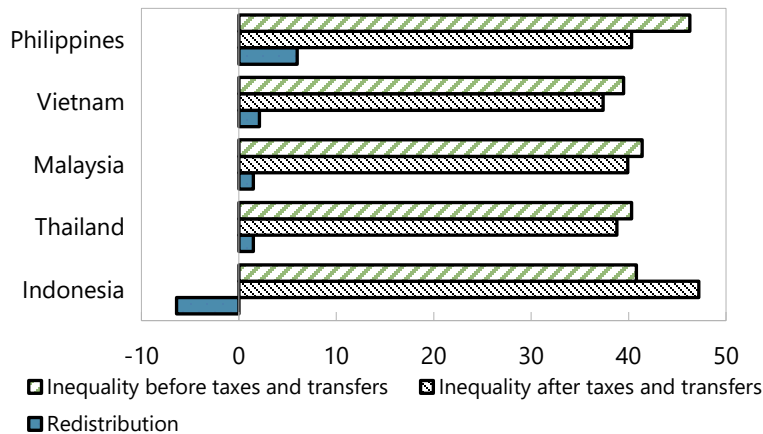
---

<sup>22</sup> Granger causality test is another useful technic to identifying causality relationship, however, it was not possible to apply to our data set due to missing observations (unbalanced panel).

both income per capita growth and equality growth. We, however, do not analyze possible effects of any specific redistributive policy in this research, we believe those policies should be tailored according to country-specific needs.

**Figure 6. Fiscal redistributions in ASEAN.**

Gini points, 2015



Data source: Standardized World Income Inequality Database (SWIID).

For instance, IMF (2014) highlights that fiscal policies need to be carefully designed to balance distributional and efficiency objectives and suggests a mix of instruments for developing countries. Those include expanding conditional cash transfer programs as administrative capacity improves; expanding noncontributory means-tested social pensions; and improving access of low-income families to education and health services and others. In addition, Claus et al. (2012) have assessed the effectiveness of redistributive fiscal policies and have quantified the impact of taxation and government expenditures on income distributions in Asia. Clements et al. (2015) emphasized that distributional impact of fiscal policy is determined by the composition of latter. Although our fiscal redistribution variable does not illustrate relative importance of tax related redistribution compared to spending related one, it would be interesting to analyze alternative indicators of fiscal policy such as ratio of direct to indirect taxes and components of spending in future research.

Our empirical results also show that FLFP is a positive and statistically significant contributor to inclusive growth through both channels. The coefficients reported in Table 2 suggest that a one percentage point increase in FLFP can approximately raise GDP per capita growth by 0.2 percentage point and the equity index growth by 0.07 percentage point. Regarding the impact of FLFP on inclusive growth through the GDP per capita channel, our results are in line with Elborgh-Woytek et al. (2013) and Gonzales et al. (2015), who suggests that higher FLFP is associated with higher economic growth. Cuberes and Teignier (2015) found that gender gaps in entrepreneurship and workforce participation lead to income losses and negatively affect productivity. In addition, UNESCAP (2017) finds that increasing women's participation in the economy could add an additional US\$12 trillion to annual global output by 2025. Based on the UNESCAP report, across the ten ASEAN

members, an estimated 61.3 million women entrepreneurs (about 9.8 percent of the total ASEAN population) own and operate businesses.

On average, higher gaps in labor force participation between men and women may result in inequality of earning between sexes creating income inequality (Gonzales et al. 2015). According to our results, bringing more women into the workforce will have a positive effect on equality. It was recently widely discussed that gender and income inequalities are linked<sup>23</sup> and that existing inequality of opportunities between males and females, including unequal access to education, healthcare and finance (i.e. inequality of opportunities which affect the ability of females to participate in the labor force), is strongly associated with income inequality.

Our results suggest that labor productivity growth is likely to affect inclusive growth through an increase in per capita income, while not contributing to equity improvement. According to our results, net FDI inflows have a positive and significant impact on GDP per capita growth and therefore on inclusive growth, as also highlighted in Anand et al. (2013). While in our analysis financial deepening, measured as the credit-to-GDP ratio, does not have a significant impact on inclusive growth measure (in line with Anand et al. 2013), the net savings ratio significantly and positively affects inclusive growth through both channels. Historically, Asia has had comparatively higher savings ratios attributed to insufficient availability of social services such as healthcare and education, limited public pensions, and higher rates of natural disasters. Those higher rates of savings can help smooth consumption and enhance investment, thus improving equality and supporting per capita growth. Finally, our analysis shows that the proxy of digitalization has a significantly positive impact on inclusive growth through both channels.

---

<sup>23</sup> For example, see the IMF blog <https://blogs.imf.org/2015/10/22/empowering-women-tackling-income-inequality/> .

**Table 2. Determinants of Inclusive Growth, Panel Regression Results.**

	Dependent Variable		
	$\Delta\bar{y}^*$ - inclusive growth	$\Delta\bar{y}$ – income per capita growth	$\Delta\omega$ – equity index growth
Lagged GDP per capita	1.925** (0.92)	-0.899 (0.70)	2.824*** (0.64)
CPI inflation rate	-0.030 (0.03)	-0.016 (0.03)	-0.013 (0.02)
Redistribution	0.687*** (0.19)	0.402* (0.15)	0.285** (0.13)
Female labor force participation	0.268*** (0.06)	0.203*** (0.044)	0.066* (0.04)
Productivity growth	0.850*** (0.04)	0.886*** (0.03)	-0.036 (0.01)
FDI	0.073*** (0.02)	0.086*** (0.02)	-0.013 (0.01)
Credit-to-GDP ratio	0.003 (0.01)	0.009 (0.01)	-0.006 (0.00)
Savings ratio	0.063*** (0.02)	0.034*** (0.01)	0.029** (0.01)
Digitalization	0.480* (0.27)	0.295 (0.21)	0.185 (0.18)
Number of observations	215	215	215
Number of countries	11	11	11
R-squared	0.81	0.89	0.20
Prob > F	0.000	0.000	0.000

Source: Authors' calculation. \* denotes statistical significance at 10 percent level, \*\* denotes statistical significance at 5 percent level, \*\*\* denotes statistical significance at 1 percent level. Standard errors are in parentheses.

Interestingly, lagged GDP per capita is insignificant determinant of GDP per capita growth. This result is in line with Aoyagi et al. (2015), and is consistent with the observation by Solow (1956) that the rate of growth tends to fall as the income level rises. On the other hand, higher income per capita has positive and significant effect on the equity index, which suggests that ASEAN countries have entered the phase where economic growth produces more equal income distribution (following Kuznets 1955).

#### D. Robustness Checks

In addition to our benchmark model we have also estimated a number of alternative specifications to confirm the robustness of our empirical results. Appendix Table 3 presents the results for the specifications in which we have included alternative regressors, such as the

lagged dependent variable (to further control for endogeneity bias), total labor force participation instead of FLFP, and trade openness. The results are broadly consistent with those for the benchmark estimation presented in Table 2. Finally, we have performed additional robustness checks by excluding two economies (China and India) from our benchmark model. In this alternative specification, the signs and significance of the regressors are broadly consistent with our benchmark estimation (Table 4).

## V. Evaluation of Structural Reforms in ASEAN

In this section we perform an evaluation of selected structural reforms in ASEAN countries based on the regression results reported in Section IV. The impact of the reforms in terms of their impact on inclusive growth can be measured by estimating the effects of changes in policy variables on the dependent variables based on the all-sample regression results (Table 2). Our scenario analysis is based on partial differentiation of our original model (equation 1) and considers marginal effects of changes in each determinant of inclusive growth (i.e. assuming that all other things are held constant).<sup>24</sup>

Structural reform plans in ASEAN include the Eleventh Malaysia Plan (11MP), on which we will focus as an example in this section. The 11MP incorporates strategies and targets for Malaysia to reach a high-income status and inclusive economic development.<sup>25</sup> Specific labor market policies and targets include boosting productivity, improving labor market efficiency and institutions, encouraging female labor force participation, and creating higher-skilled jobs. In particular, the 11MP aims at increasing FLFP to 56.5 percent (from 54.7 percent in 2017<sup>26</sup>) while also raising overall labor productivity growth to 3.7 percent by 2020. The plan also includes a target to reduce overall income inequality by reducing the Gini coefficient to 0.385 in 2010 (from 0.399 in 2016).

In Table 3 we evaluate the potential impact of some of the structural reforms targets included in the 11MP by mapping them into changes in some of our regressors and simulating by how much the change would impact inclusive growth according to the results of our benchmark model regressions. In doing so, we assume that:

- FLFP would increase from the current 54.7 percent to the targeted 56.5 percent;<sup>27</sup>
- Given that Malaysia has already achieved the level of labor productivity growth of 3.7 percent targeted under the 11MP, we assume an increase of labor productivity growth to 4 percent;

---

<sup>24</sup> See more details in Aoyagi et al. (2015).

<sup>25</sup> IMF Country Report No. 19/71 Malaysia. International Monetary Fund Washington, D.C.

<sup>26</sup> Mid-term review of the 11MP, <https://www.mea.gov.my/en/rmk/mid-term-review-eleventh-malaysia-plan-2016-2020>.

<sup>27</sup> See more on the role of women in the workforce in Malaysia in Schmillen et al. (2019).

In addition, according to Mid-term review of 11<sup>th</sup> MP, one of the targets for 2020 is to improve overall income inequality to 0.385 (or 38.5) Gini coefficient.<sup>28</sup> Since this target is roughly equal to calculated population weighted East Asia and Pacific Gini average which is around 38.4 (Figure 3), assuming a target for redistribution is as the average redistribution in East Asia and Pacific, we can consider a following scenario:

- Fiscal redistribution in Malaysia would increase from the current level of 1.3 to the level of East Asia and Pacific countries of 4.7.

The simulation results reported in Table 3 suggest that the total impact of achieving the three targets discussed above on GDP per capita growth would be 2 percent, while the total impact on the equity index growth would be approximately 1.1 percent, resulting in a total impact of 3.1 percent on inclusive growth.

**Table 3. Malaysia, Scenario Analysis Results.**  
Dependent Variable

Scenario	$\Delta\bar{y}^*$ - inclusive growth	$\Delta\bar{y}$ – per capita growth	$\Delta\omega$ – equity index growth
Female labor force participation (from 54.7 percent to 56.5 percent)	0.49	0.36	0.13
Labor productivity (from 3.7 percent to 4.0 percent)	0.26	0.27	-0.01
Redistribution increases to East Asia & Pacific average (from 1.3 to 4.7)	2.35	1.36	0.99
Total impact	3.10	1.99	1.11

Source: Authors' calculations.

Other structural reform plans in ASEAN include Thailand's 12th National Development Plan and Thailand 4.0, the Philippine Development Plan 2017 – 2022, and Vietnam's 5-year Socio-Economic Development Plan of 2016 – 2020. Reform targets in those plans include reaching high income status, improving competitiveness, boosting productivity, improving labor market conditions, enhancing the social fabric, inequality-reducing transformation, narrowing down income disparities and boosting inclusive growth.

Although other ASEAN countries have their own reform plans and targets, for illustrative purposes, similarly to what we have done for scenario analysis based on the 11MP, we can conduct scenario analyses to estimate possible impacts on inclusive growth in Indonesia, Philippines, Thailand, Vietnam, considering hypothesis that their current levels of redistribution, FLFP, and labor productivity were to increase to East Asia and Pacific average levels. Although this does not imply that achieving those targets will necessary help ASEAN to achieve the East Asia and Pacific levels of growth and equity, simulation results based on

<sup>28</sup> Page 11-4 of <https://www.mea.gov.my/en/rmk/mid-term-review-eleventh-malaysia-plan-2016-2020>



available data suggest that the total impact of achieving some targets on inclusive growth in ASEAN could be sizable. (Appendix, Table 6).

## VI. Concluding Remarks

The relationship between equality and efficiency has long been debated amongst economists. While earlier contributions tended to regard equity as an obstacle to or as a result of growth, recently the focus has shifted towards looking at growth and inequality jointly under the concept of inclusive growth. In this paper we have analyzed the impact of monetary, fiscal, and macro-structural factors on inclusive growth and its components—namely GDP per capita growth and the change in an equity index—in the context of ASEAN countries, in which steady income per capita and progress in poverty reduction in recent decades have not been accompanied by a notable decline in inequality.

On the basis of our empirical analysis we have also built scenario analysis to evaluate some of ASEAN's structural reform plan policies in terms of their simultaneous impacts on growth and equity. The scenario analysis suggests that such plans are on average inclusive. We found that labor productivity growth and FDI inflows contribute to inclusive growth through the income per capita channel. On the other hand, fiscal redistribution, FLFP participation and savings contribute to inclusiveness through both equity and income growth. Our results suggest that it is important for ASEAN countries to focus on a well-balanced reform approach, considering likely reform outcomes not only in terms of their aggregate impact on inclusive growth, but also on its components. According to our analysis, ASEAN has a remarkable potential to boost inclusive growth through fiscal redistribution without any trade-off between efficiency and equity.

Our analysis also suggests that labor market reforms aimed at bringing more women into the labor force can boost income per capita growth and equity simultaneously, underlying the importance for ASEAN to push forward with policy efforts in this direction. Finally, although, the combined impact of digitalization, which is incorporated as a proxy for financial inclusion, on inclusive growth remains weakly significant, we believe that it is important for ASEAN government to further deepen financial inclusion by promoting account ownership, improving accessibility to financial institutions, and by increasing affordability of financial services to various income groups. In addition, digitalization in its broader sense can go beyond benefitting individuals and businesses, and can help governments to improve tax collection, public service delivery, and data accuracy.<sup>29</sup>

The key takeaway of this study is that in order for ASEAN countries to achieve more inclusive growth, it is important to aggressively proceed with appropriate structural reform plans. It is important to keep in mind, that while our scenario analysis indicates which policies can on average contribute to inclusive growth, it does not allow us to isolate the country-specific effects of such policy measures. Using available sub-national level data for more precise country-specific results, as was done for example in Aoyagi et al. (2015) who

---

<sup>29</sup> Source: <https://blogs.imf.org/2018/09/26/the-digital-accelerator-revving-up-government-in-asia/>

analyzed the impact of government reforms on inclusive growth using prefectural data for Japan, is an interesting avenue for future research.

## APPENDIX

### A. Inclusive Growth Indicator

Our inclusive growth indicator is in line with Anand et al. (2013) which is built on Ali and Son (2007). The latter propose a methodology to measure inclusive growth in terms of increasing a social opportunity function, which depends on two factors: i) average opportunities available to the population, and ii) how opportunities are shared among the population. Following Ali and Son (2007) and considering income as an opportunity, we can derive a social welfare function considering a distribution of income  $x_i$  for population  $n$ , where all individuals are indexed by ascending order of income levels  $i = 1, 2, \dots, n$ , where  $x_1$  is the poorest person and  $x_n$  is the richest person. The social welfare function will be:

$$W = W(x_1, x_2, \dots, x_n) \quad (1)$$

which is an increasing function of its argument. We then can define a social opportunity function where the  $i$ th person with income  $x_i$  enjoys the opportunity  $y_i$ :

$$O = O(y_1, y_2, \dots, y_n) \quad (2)$$

which is increasing in its argument, meaning that the opportunity function increases when the income (opportunity) of any individual increases. More equally distributed income opportunities (pro-poor redistribution) will indicate more inclusiveness. To address that we can consider a measure of inclusiveness based on the concept of generalized concentration curve.<sup>30</sup> Ali and Son (2007) define a generalized concentration curve, or a social mobility curve (SMC)  $S^c$ :

$$S^c \approx \left( y_1, \frac{y_1+y_2}{2}, \frac{y_1+y_2+y_3}{3}, \dots, \frac{\sum_j^i y_j}{i}, \dots, \frac{\sum_j^n y_j}{n} \right) \quad (3)$$

where the last term is equal to the population mean of the available opportunities,  $i$  is the percentile of income. Hence, SMC represents the opportunities available for the bottom  $i$ -th percentiles of income or the ability for the bottom percentiles in the income distribution to escape into the higher income groups.

To capture the magnitude of the change in income distribution, Anand et al. (2013) use a simple form of the social mobility curve to calculate a so-called Social Mobility Index (SMI) by integrating the area under the social mobility curve:

$$\bar{y}^* = \int_0^{100} \bar{y}_i d \quad (4)$$

The greater  $\bar{y}^*$  the greater the income, in the case in which all individuals in the population have the same income, in other words if the income distribution is completely equal, then  $\bar{y}^*$

---

<sup>30</sup> See Kakwani (1980) for more details.

will be equal to mean income  $\bar{y}$ . In the case in which  $\bar{y}^*$  is lower than  $\bar{y}$ , the distribution of income is inequitable.

Ali and Son (2007) propose the income equity index (IEI):

$$\omega = \frac{\bar{y}^*}{\bar{y}} \quad (5)$$

which is scaled between 0 and 1, with 1 indicating a completely equal income distribution and 0 indicating a totally unequal one. Rearranging we obtain:

$$\bar{y}^* = \omega * \bar{y} \quad (6)$$

differentiating (6) we obtain the inclusive growth equation:

$$d\bar{y}^* = \bar{y}d\omega + \omega d\bar{y} \quad (7)$$

which integrates equity and income growth into single measure. We define the change in social mobility index  $d\bar{y}^*$  as the change of the degree of growth inclusiveness. If  $d\bar{y}^* > 0$ , growth is considered as inclusive. This measure allows us to decompose inclusive growth into income growth and change in equity.

$$\frac{d\bar{y}^*}{\bar{y}^*} = \frac{d\bar{y}}{\bar{y}} + \frac{d\omega}{\omega} \quad (8)$$

Equation (8) is the fundamental equation integrating GDP per capita growth and equity index growth into a single measure of inclusive growth comparable over time. Obviously, inclusive growth can be achieved through i) increasing average income growth, ii) increasing income equity index growth; iii) a combination of i) and ii).

## B. Variables and Descriptive Statistics

Variable	Description	Source
Inclusive growth	Real income per capita adjusted for the change in equity index using income distribution data. Net disposable income for countries is measured based on final consumption expenditure (except Malaysia, where income-based measure is used).	Authors' calculation based on World Bank PovcalNet database.
Income per capita growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.	World Bank.
Lagged GDP per capita	Lagged GDP per capita based on purchasing power parity (PPP) in logs.	World Bank.
Inflation rate	Annual year-on-year percentage change of CPI.	Authors' calculation based on IMF IFS data.
Redistribution	Difference between market and net income inequality based on Gini points.	Calculated based on Solt, F. (2019) SWIID 8.0 database.
FLFP	Labor force participation rate, female (percent of total pop. ages 15+)	International Labour Organization, ILOSTAT database.
LFP	Labor force participation rate, total (percent of total pop. ages 15+)	International Labour Organization, ILOSTAT database.
Digitalization	Mobile cellular subscriptions (per 100 people) in log.	International Telecommunication Union.
FDI	Net inflows as percent of GDP.	IMF, World Bank.
Productivity growth	GDP per person employed (constant 2011 PPP \$) in log.	International Labour Organization, ILOSTAT database.
Credit-to-GDP ratio	Domestic credit to private sector by banks as percent of GDP.	IMF, World Bank.
Savings	Net national savings (gross national savings less the value of consumption of fixed capital) as percent of GNI.	World Bank.
Trade openness	The sum of exports and imports of goods and services measured as percent of GDP.	World Bank.

Variable	Obs	Mean	Std. Dev.	Min	Max
Inclusive growth	220	4.42	3.19	-12.38	14.37
Income per capita growth	220	4.44	3.23	-14.35	15.15
Equity index growth	220	-0.02	1.01	-4.06	3.27
Lagged GDP per capita	286	3.72	0.30	3.13	4.41
Inflation rate	285	8.30	19.36	-1.40	268.15
Redistribution	269	0.61	3.50	-7.30	6.00
FLFP	286	52.03	16.48	23.02	80.02
Digitalization	285	44.41	47.76	0	176.04
FDI	286	3.10	4.85	-37.16	43.91
Productivity growth	275	3.94	3.28	-16.94	12.66
Credit-to-GDP ratio	286	56.25	41.79	4.52	166.50
Savings ratio	274	19.16	8.71	-9.69	1.97

Source: Authors' calculation.

### C. Alternative Specifications and Scenarios.

**Table 1. Arellano-Bond dynamic panel-data estimation.**

	Dependent Variable $\bar{y}^*$ -inclusive growth
Lagged GDP per capita	1.350 (0.94)
CPI inflation rate	-0.022 (0.02)
Redistribution	0.773*** (0.31)
Female labor force participation	0.274*** (0.09)
Productivity growth	0.852*** (0.04)
FDI	0.067*** (0.02)
Credit-to-GDP ratio	-0.009 (0.02)
Savings ratio	0.054*** (0.02)
Digitalization	0.441* (0.25)
Number of observations	196
Number of countries	11
Prob > F	0.000

Sargan p-value 0.070

Source: Authors' calculation. \* denotes statistical significance at 10 percent level, \*\* denotes statistical significance at 5 percent level, \*\*\* denotes statistical significance at 1 percent level. Robust standard errors are in parentheses.

### Arellano-Bond test for autocorrelation

Order	z	Prob > z
1	-1.87	0.06
2	0.48	0.63

Source: Authors' calculation. Note: Null hypothesis: no autocorrelation.

**Table 2. Determinants of Inclusive Growth, excluding CPI inflation rate.**

Dependent Variable $\bar{y}$ -inclusive growth	
Lagged GDP per capita	1.856** (0.91)
Redistribution	0.684*** (0.19)
Female labor force participation	0.266*** (0.06)
Productivity growth	0.827*** (0.04)
FDI	0.076*** (0.02)
Credit-to-GDP ratio	-0.000 (0.01)
Savings ratio	0.065*** (0.02)
Digitalization	0.429* (0.26)
Number of observations	215
Number of countries	11
R-squared	0.81
Prob > F	0.000

Source: Authors' calculation. \* denotes statistical significance at 10 percent level, \*\* denotes statistical significance at 5 percent level, \*\*\* denotes statistical significance at 1 percent level. Robust standard errors are in parentheses.

**Table 3. Determinants of Inclusive Growth, Alternative Specifications.**

	Dependent Variable $\bar{y}^*$ -inclusive growth		
Lagged GDP per capita	1.095 (0.97)	2.254** (1.10)	2.042** (0.93)
CPI inflation rate	-0.052 (0.03)	-0.051 (0.04)	-0.029 (0.03)
Redistribution	0.801*** (0.19)	0.632*** (0.04)	0.697*** (0.19)
Female labor force participation	0.261*** (0.06)		0.270*** (0.056)
Productivity growth	0.857*** (0.04)	0.847*** (0.18)	0.851*** (0.04)
FDI	0.072*** (0.02)	0.074*** (0.02)	0.073*** (0.02)
Credit-to-GDP ratio	-0.011 (0.02)	-0.010 (0.02)	0.001 (0.01)
Savings ratio	0.052*** (0.02)	0.063*** (0.02)	0.062*** (0.02)
Digitalization	0.474* (0.27)	0.451* (0.27)	0.502* (0.27)
Labor force participation		0.319*** (0.09)	
Trade openness			0.009 (0.01)
Lagged dependent variable	0.107*** (0.04)	0.102** (0.04)	
Number of observations	207	207	215
Number of countries	11	11	11
R-squared	0.82	0.82	0.81
Prob > F	0.000	0.000	0.000

Source: Authors' calculation. \* denotes statistical significance at 10 percent level, \*\* denotes statistical significance at 5 percent level, \*\*\* denotes statistical significance at 1 percent level. Standard errors are in parentheses.



**Table 4. Determinants of Inclusive Growth, excluding China and India.**

	Dependent Variable $\bar{y}^*$ -inclusive growth	
	Excluding China	Excluding China and India
Lagged GDP per capita	0.166 (1.14)	0.322 (1.17)
CPI inflation rate	-0.055 (0.03)	-0.055 (0.04)
Redistribution	0.529* (0.31)	0.610** (0.31)
Female labor force participation	0.350*** (0.06)	0.357*** (0.06)
Productivity growth	0.843*** (0.04)	0.844*** (0.04)
FDI	0.078*** (0.02)	0.078*** (0.02)
Credit-to-GDP ratio	0.015 (0.01)	0.015 (0.01)
Savings ratio	0.051*** (0.02)	0.052*** (0.02)
Digitalization	0.440* (0.26)	0.457* (0.27)
Number of observations	195	187
Number of countries	10	9
R-squared	0.83	0.83
Prob > F	0.000	0.000

Source: Authors' calculation. \* denotes statistical significance at 10 percent level, \*\* denotes statistical significance at 5 percent level, \*\*\* denotes statistical significance at 1 percent level. Standard errors are in parentheses.

**Table 5. Inclusive Growth, GDP per capita Growth, and Equity Growth, 1990-2017.**

<b>Country</b>	$\Delta\bar{y}^*$ - <b>inclusive growth</b>	$\Delta\bar{y}$ - <b>per capita growth</b>	$\Delta\omega$ - <b>equity index growth</b>
Indonesia	2.9	3.3	-0.4
Malaysia	3.9	3.4	0.4
Philippines	2.7	2.5	0.2
Thailand	4.0	3.5	0.5
Vietnam	5.8	5.8	0.0

Source: Authors' calculations. Note: Initial years are 1993 for Indonesia, 1992 for Malaysia, 1991 for Philippines, 1990 for Thailand, 1992 for Vietnam. Latest years are 2017 for Indonesia, 2015 for Malaysia, 2015 for Philippines, 2017 for Thailand, 2016 for Vietnam.

**Table 6. ASEAN, Scenario Analysis Results.**

Country	Scenario	$\Delta\bar{y}^*$ - inclusive growth	$\Delta\bar{y}$ - per capita growth	$\Delta\omega$ - equity index growth
Indonesia	Redistribution increases to East Asia & Pacific average (from -5.5 to 4.7)	7.7	4.5	3.3
	FLFP increases to East Asia & Pacific average (from 52.17 to 59.3 percent)	1.8	1.3	0.5
	Labor productivity growth increases to East Asia & Pacific average (from 1.3 to 4.7 percent)	2.9	3.0	-0.1
Philippines	Redistribution increases to East Asia & Pacific average (high income) (from 6.0 to 9.1)	2.1	1.2	0.9
	FLFP increases to East Asia & Pacific average (from 44.9 to 59.3 percent)	3.9	2.9	1.0
Thailand	Redistribution increases to East Asia & Pacific average (from 1.6 to 4.7)	2.1	1.2	0.9
	Labor productivity growth increases to East Asia & Pacific average (from 2.1 to 4.7 percent)	2.2	2.3	-0.1
Vietnam	Redistribution increases to East Asia & Pacific average (from 2.2 to 4.7)	1.7	1	0.7
	Labor productivity growth increases to East Asia & Pacific average (from 4.6 to 4.7 percent)	0.1	0.1	0

Note: Redistribution data is for 2015-2017 based on data availability. FLFP is as of 2017 is based on national statistics. East Asia & Pacific average for FLFP (2017) is a regional aggregate by World Bank (based on ILO estimate and includes all income levels). Labor productivity data is of 2017, East Asia & Pacific average (regional aggregate by World Bank, includes all income levels). Source: Authors' calculations.

## REFERENCES

- Acemoglu, D. and D. Autor. 2011. "Skills, Tasks and Technologies: Implications for Employment and Earnings." NBER Working Paper No. 16082 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Aizenman, J., M. Lee, and D. Park, 2012. "The Relationship between Structural Change and Inequality: A Conceptual Overview with Special Reference to Developing Asia." ADBI Working Paper No. 2012.
- Albanesi, S. 2007. "Inflation and inequality." *Journal of Monetary Economics*, Elsevier, vol. 54(4), pages 1088-1114, May.
- Aghion, P., E. Caroli, and C. Garcia-Penalosa. 1999. "Inequality and Economic Growth: The Perspective of the New Growth Theories." *Journal of Economic Literature*, 37 (4):1615-1660.
- Asian Development Bank (ADB). 2016. Asian Development Outlook (ADO) "Asia's Potential Growth".
- Asian Development Bank (ADB). 2019. Asian Development Outlook (ADO) "Strengthening Disaster Resilience".
- Asian Development Bank Institute. 2019. "Demystifying Rising Inequality in Asia." Edited by B. Huang, P. J. Morgan, and N. Yoshino.
- Ali, I., and Son, H. H. 2007. Measuring Inclusive Growth. *Asian Development Review*, 24(1), 11-31.
- Anand, R., Mishra, S., and Peiris, S. J. 2013. Inclusive Growth: Measurement and Determinants. *IMF Working Paper*, 13/135.
- Aoyagi, C., Ganelli, G., and Murayama, K. 2016. "How Inclusive Is Abenomics?" *Journal of International Commerce, Economics and Policy*, Vol. 07, Issue 01.
- Aoyagi, C. and Ganelli, G. 2015. "Asia's Quest for Inclusive Growth Revisited." *Journal of Asian Economics*, Vol. 40(C), pp. 29-46.
- Balakrishnan, R., S., Chad and S., Murtaza. 2013. "The Elusive Quest for Inclusive Growth: Growth, Poverty, and Inequality in Asia." *IMF Working Paper 13/152*.
- Benabou, R., 2000. "Unequal Societies: Income Distribution and the Social Contract." *American Economic Review*, Vol. 90(1), pp. 96-129.
- Berg, A. and Ostry, J. 2011. "Inequality and Unsustainable Growth: Two Sides of the Same Coin?" *IMF Staff Discussion Note*, 11/08.

Berg, A., Ostry, J., and Zettelmeyer, J. 2012. "What makes growth sustained?" *Journal of Development Economics*, 98 (2), 149-166.

Calderon, C. and L. Serven 2004, *The Effects of Infrastructure Development on Growth and Income Distribution*, Policy Research Working Papers.

Carvalho, L. and A. Rezai. 2015. "Personal income inequality and aggregate demand." *Cambridge Journal of Economics*, Volume 40, Issue 2, March 2016, Pages 491–505,

Chaudhuri, S. and Ravallion, M. 2006. "Partially Awakened Giants: Uneven Growth in China and India." Policy Research Working Paper; No. 4069. World Bank, Washington, DC.

Claus, I.,J. Martinez-Vazquez, and V. Vulovic. 2012. Government Fiscal Policies and Redistribution in Asian Countries. ADB Economics Working Paper Series No. 310. Asian Development Bank. Corak, M. 2013. "Income Inequality, Equality of Opportunity, and Intergenerational Mobility." *Journal of Economic Perspectives*, 27 (3):79-102.

Clements, B., R. Mooij, S. Gupta, and M. Keen. 2015. Inequality and Fiscal Policy. International Monetary Fund.

Cuberes and Teignier. 2016. "Aggregate Effects of Gender Gaps in the Labor Market: A Quantitative Estimate," *Journal of Human Capital* 10-1.

Demirgüç-Kunt, A., L. Klapper, D. Singer, S. Ansar, and J. Hess. 2018. The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution, World Bank. International Telecommunication Union.

Dollar, D. and A. Kraay. 2002. "Growth is Good for the Poor". *Journal of Economic Growth* 7:195.

Doumbia, D. and T. Kinda. 2019. Reallocating Public Spending to Reduce Income Inequality. *IMF Working Paper*, 19/188.

Elborgh-Woytek, K., M. Newiak, K. Kochhar, S. Fabrizio, K. Kpodar, P. Wingender, B. Clements, and G. Schwartz. 2013. IMF Staff Discussion Note 13/10. "Women, Work, and the Economy: Macroeconomic Gains from Gender Equity."

Furceri, D, P Loungani, J D Ostry, and P Pizzuto, 2020, "Will Covid-19 affect inequality? Evidence from past pandemics," *Covid Economics* 12: 138-57.

Garcia-Penalosa, C. and S. Turnovsky. 2007. "Growth, Income Inequality, and Fiscal Policy: What Are the Relevant Trade-offs?" *Journal of Money, Credit and Banking*, 39: 369-394.

Gonzales, Jain-Chandra, Kochhar, Newiak, and Zeinullayev (2015). IMF Staff Discussion Note 15/20. "Catalyst for Change: Empowering Women and Tackling Income Inequality".

Huang, B. and G. Wan (2019), Overview of Income Inequality in Asia: Profile, Drivers and Consequences; in *Demystifying Rising Inequality in Asia*. Asian Development Bank Institute, Tokyo.

International Monetary Fund 2014. "Fiscal Policy and Income Inequality." Board Paper. International Monetary Fund, Washington, D.C.

\_\_\_\_\_. 2015. Causes and Consequences of Income Inequality: A Global Perspective. Staff Discussion Note 15/13.

\_\_\_\_\_. 2018a. Regional economic outlook. Asia and Pacific: Asia at the forefront: growth challenges for the next decade and beyond. Washington, DC: International Monetary Fund.

\_\_\_\_\_. 2018b. World Economic Outlook: Growth Slowdown, Precarious Recovery. Washington, DC, April.

\_\_\_\_\_. 2019. Finance and Development, March 2019.

\_\_\_\_\_. Country Report No. 18/62 Malaysia. International Monetary Fund, Washington, D.C.

\_\_\_\_\_. Country Report No. 19/71 Malaysia. International Monetary Fund, Washington, D.C.

\_\_\_\_\_. Country Report No. 18/287 Philippines. International Monetary Fund, Washington, D.C.

\_\_\_\_\_. Country Report No. 18/143 Thailand. International Monetary Fund, Washington, D.C.

\_\_\_\_\_. Country Report No. 18/32 Indonesia. International Monetary Fund, Washington, D.C.

\_\_\_\_\_. Country Report No. 18/215 Vietnam. International Monetary Fund, Washington, D.C.

Jain-Chandra, S., Kinda, T., Kochhar, K., Piao, S., and Schauer, J. 2016. "Sharing the Growth Dividend: Analysis of Inequality in Asia." *IMF Working Paper No. 16/48*.

Kakwani, N. 1980. "On a Class of Poverty Measures." *Econometrica*. 48-2, 437-446.

Keeley, B. 2015. "What's happening to income inequality?", in *Income Inequality: The Gap between Rich and Poor*, OECD Publishing, Paris.

Keynes, John Maynard 1936. *The General Theory of Employment, Interest and Money*. London, Macmillan.

Kuznets, S. 1955. Economic Growth and Income Inequality. *American Economic Review* 45(1), 1-28.

OECD/ERIA 2018, SME Policy Index: ASEAN 2018: Boosting Competitiveness and Inclusive Growth, SME Policy Index, OECD Publishing, Paris/ERIA, Jakarta, <https://doi.org/10.1787/9789264305328-en>. Chapter 13. Cambodia.

Okun, A. M. 1975, *Equality and Efficiency: the Big Trade-Off* (Washington: Brookings Institution Press).

Ostry, J. D., Berg, A., and Tsangarides, C.G. 2014. Redistribution, Inequality, and Growth. *IMF Staff Discussion Notes* 14/02.

Ravallion, M., and S. Chen, 2003, "Measuring Pro-Poor Growth," *Economics Letters*, 78, 93–99.

Romer, C. and D. Romer 1998. "Monetary Policy and the Well-Being of the Poor." NBER Working Paper No. 6793.

Schmillen, Achim Daniel; Tan, Mei Ling; Abdur Rahman, Amanina Binti; Lnu, Shahrul Natasha Binti Halid; Weimann Sandig, Nina. 2019. *Breaking Barriers: Toward Better Economic Opportunities for Women in Malaysia* (English). The Malaysia Development Experience Series. Washington, D.C.: World Bank Group.

Solow, R. M. 1956. A contribution to the theory of economic growth. *The quarterly journal of economics*, 65-94.

Solt, Frederick. 2019. "Measuring Income Inequality Across Countries and Over Time: The Standardized World Income Inequality Database." SWIID Version 8.0, February 2019.

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). 2017. *Fostering Women's Entrepreneurship in ASEAN*.

World Bank. 2016. *Poverty and Shared Prosperity 2016: Taking on Inequality*. Washington, DC: World Bank.

World Income Inequality Report. 2018. World Inequality Lab. <https://wir2018.wid.world/>

Zhuang, J., Kanbur, R., and Rhee, C. 2014. "Rising Inequality in Asia and Policy Implications." ADBI Working Paper 463.