



Munich Personal RePEc Archive

Functional Income Distribution and Inequality in the Asia-Pacific Countries

Raihan, Selim

15 September 2021

Online at <https://mpra.ub.uni-muenchen.de/110469/>
MPRA Paper No. 110469, posted 02 Nov 2021 00:12 UTC

15 September 2021

Functional Income Distribution and Inequality in the Asia-Pacific Countries

Selim Raihan¹

¹ Dr. Selim Raihan is Professor, Department of Economics, University of Dhaka, Bangladesh, and Executive Director, South Asian Network on Economic Modeling (SANEM). Email: selim.raihan@gmail.com

Contents

Executive Summary	4
1. Introduction	8
2. Review of Literature	9
3. Status and Trends of Labor Share in GDP in the Asia-Pacific Countries	13
3.1. <i>Trends of labor share in GDP by sub-regions in the Asia-Pacific</i>	<i>14</i>
3.2. <i>Factors affecting the trends of labor share in GDP.....</i>	<i>20</i>
3.3. <i>Summary and analysis of the findings</i>	<i>24</i>
4. Trends of Labor Productivity, Wage and the Gap between Productivity and Wage in the Asia-Pacific Countries	25
4.1. <i>The trends of labor productivity, wage, and gap.....</i>	<i>26</i>
4.2. <i>Factors affecting the gap between labor productivity and wage.....</i>	<i>30</i>
4.3. <i>Summary and analysis of the findings</i>	<i>33</i>
5. Trends in Inequality in the Asia-Pacific Countries	34
5.1. <i>Trends of inequality in the Asia-Pacific Countries during 2004 - 2017</i>	<i>34</i>
5.2. <i>The relation between labor share in GDP and inequality in the Asia-Pacific Countries and associated determining factors</i>	<i>35</i>
5.3. <i>Summary and analysis of the findings</i>	<i>37</i>
6. COVID-19: Contexts and Priorities for the Labor Market	38
7. Policy Implications and Conclusion.....	41
References	44

List of Tables

Table 1: Country-wise labor share in GDP and ranking of Asia-Pacific countries between 2004 and 2017	16
Table 2: Annual average productivity growth and wage growth in Asia-Pacific between 2004 and 2017	19
Table 3: Cross-country panel regression of labor share in GDP for the Asia-Pacific countries	22
Table 4: Technology and labor market institution in the cross-country panel regression of labor share	23
Table 5: Sub-regional dummies in the cross-country panel regression of labor share	23
Table 6: Country-wise labor productivity, wage, and gap of Asia-Pacific countries between 2004 and 2017	26
Table 7: Percentage gap of labor productivity and wage of Asia-Pacific countries from the world averages	27
Table 8: Cross-country panel regression of the gap between labor productivity and wage in Asia-Pacific	31
Table 9: Technology and labor market institution in the cross-country panel regression of “gap”	31
Table 10: Sub-regional dummies in the cross-country panel regression of “gap”	32
Table 11: Cross-country panel regression of the gini in the Asia-Pacific countries	37

List of Figures

Figure 1: Trends of labor share in GDP in the Asia-Pacific region	15
Figure 2: Per capita GDP and labor share in GDP in countries of Asia-Pacific	18
Figure 3: Per capita GDP and ‘gap’ among the Asia-Pacific countries	29
Figure 4: Gini index of the Asia-Pacific countries in 2004 and 2017	35
Figure 5: Working hour losses in the Asia-Pacific during 2020	39

List of Box

Box 1: Methodology of calculation of labor share in GDP by ILO	13
--	----

Executive Summary

In recent decades there has been a growing interest around functional income distribution. The functional income distribution determines how output is distributed among the factors of production, such as capital and labor. Labor remuneration, expressed as a share of value added or GDP, is known as the labor share and the residual is, therefore, the capital share.

The interest on functional income distribution has grown into concern with the upsurge of the recent global economic crisis, and many countries experiencing millions of jobs losses, raising unemployment rates to all-time highs. The labor income share has also captured attention, including outside the academic debate, particularly as an inequality measure. The measure is included as an indicator to assess progress towards the United Nations Sustainable Development Goals.

Studies have focused on the channels related to international trade and technological progress influencing employment, wages, and the labor share. Studies have also indicated other factors such as the economic growth, foreign direct investment, and social policies.

Against this backdrop, the main objective of this paper is to present an analysis of the trend and patterns of the share of labor in GDP in countries of Asia and the Pacific region, identify policy-relevant stylized facts, analyze the reasons behind observed trends, identify possible drivers and expected future changes in the labor share and in inequality, and assess the relationship between labor's share in GDP and inequality. This paper applies statistical analysis and relevant econometric models to generate evidence in an analytically systematic manner.

Our analysis shows that the world labor income share presented a downward trend in the period from 2004 to 2017, with a clear countercyclical behavior during the financial crisis and in its aftermath. The world average share declined from 53.7 percent in 2004 to 51.4 percent in 2017.

Except Australia and New Zealand (ANZ), all the sub-regions in Asia-Pacific held much lower labor shares in GDP than the world average. Among the five sub-regions of the Asia-Pacific countries, even with a declining trend, ANZ always held the highest share and its share remained much higher than the world average during all the years between 2004 and 2017. In 2004, ANZ's labor share in GDP was 58.4 percent which declined to 56.2 percent in 2017. Eastern Asia maintained the trend lower than the world average, and since 2010 Eastern Asia started converging towards the world average. Since 2015, its figure almost coincided the world average. In 2004, Eastern Asia's labor share in GDP was 50.1 percent which declined to 48.3 percent in 2010 and then increased to 51.3 percent in 2017. For the Southern Asia, between 2004 and 2007, the share declined from 55.2 percent to 50 percent and then increased to 54.7 percent in 2009. Then there had been a secular decline in the share from 54.7 percent in 2009 to 46.7 percent in 2017. South-Eastern Asia also registered secular decline between 2009 and 2017. In 2004, South-Eastern Asia's labor share in GDP was 42.2 percent which declined to 38.6 percent in 2017. Similarly, Pacific's labor share in GDP declined from 40.9 percent in 2004 to 35.5 percent in 2017.

Regression analyses suggest that trade openness and FDI have negative association with the labor share in GDP in the Asia-Pacific countries. This raises concerns about the pattern of globalization in the Asia-Pacific countries. Trade openness and FDI have not been labor friendly in most of these countries. Economic growth and structural transformation processes have also not been favorable in raising the labor share in GDP. The labor share is strongly and negatively correlated with per capita GDP; this exacerbates average income differences between countries, resulting in a very unequal distribution of labor income among the Asia-Pacific countries. This also indicates that the pattern of economic growth and structural transformation in most of the Asia-Pacific countries have not been labor friendly. Also, technological development has not been labor friendly in most of these countries, as technological advancement in the Asia-Pacific countries has been rather capital intensive. Non-agricultural employment share in total employment has a negative association with the labor share in GDP. Advanced and developing economies in Asia faced different forms of duality, i.e., formal vs. informal, rural vs. urban, good working condition, vs, poor working condition, etc. in their labor markets, which also exacerbated income inequality. While these dualities kept unemployment low, non-regular workers typically earned less, and received fewer training opportunities and lower social insurance coverage, which contributed to higher wage inequality and lower social mobility. In developing Asia, informality was the biggest driver of dual labor markets and economies, with the share of informality in non-agricultural employment being as high as 70 percent or more in India, Indonesia, and the Philippines. Education has a positive association with the labor share in GDP. Education enhances labor productivity and wages and thus can contribute to the rise in labor share in GDP. Countries with higher level of educational achievement showed higher level of labor share in GDP. Therefore, education can be an important tool to rebalance the economic and social powers between labor and capital. Finally, pro-worker labor institution can have a positive impact on the rise in the labor share in GDP.

Our analysis shows that all the five sub-regions, including the world average as a reference point, registered a rise in labor productivity and wage between 2004 and 2017. Labor productivity and wage of ANZ remained the highest among the five sub-regions in the Asia-Pacific. The lowest labor productivity and wage are of Southern Asia.

We calculated the gap between labor productivity and wage where the gap is calculated as the shortfall of wage from labor productivity as percentage of wage. The sub-regional averages of gaps are calculated using the weights of the population of respective countries. Between 2004 and 2017, while the gap of world average increased, four out of the five sub-regions in the Asia-Pacific also witnessed the rise in the gap. Only Eastern Asia experienced a fall in the gap, primarily due to the fall in gap in China. In 2017, the gap was the highest for the Pacific followed by South-Eastern Asia and Southern Asia, and all these three sub-regions registered higher gaps than the world average for both 2004 and 2017. ANZ always maintained lower gap than the world average, and for Eastern Asia the gap became lower than the world average in 2017. The Pacific's high average gap is driven by the very high gap of Papua New Guinea as Papua New Guinea constitutes around 80 percent of the population of the Pacific Island countries.

The regression results suggest that trade openness and FDI have positive association with the gap between labor productivity and wage in the Asia-Pacific countries. As countries liberalized

their trade regimes and attracted FDI to remain competitive in the global export market, this has depressed wage growth. However, together with trade liberalization and FDI, technological development led to productivity growth at a faster rate than wage growth, which contributed to the rise in the gap. The regression results also suggest that education has a negative association with the gap. As education increases workers' expectation about the wage increases' so, there is a positive pressure on wage growth with the increased level of education.

Both per capita GDP and non-agricultural employment have positive association with the rise in the gap in the Asia-Pacific countries. This suggests that the structural transformation and economic growth process in many Asia-Pacific region remained far from being inclusive. While Asia-Pacific's growth record in recent time has been remarkable, there is a growing concern that the benefits are not equitably shared as poverty remained high despite the recent decline and inequality was increasing. High degree of informality in the labor market in many Asia-Pacific countries also keep the wage growth suppressed. More than 68 percent of the employed population in Asia-Pacific are in the informal economy and most of them lack social protection, rights at work and decent working conditions. Southern Asia and South-Eastern Asia and the Pacific have higher shares of informal employment than Eastern Asia. In 2016, shares were 50.7 per cent in Eastern Asia, 75.2 per cent in Southern Asia and the Pacific and 87.8 per cent in Southern Asia. Finally, presence of stronger labor market institutions has a negative association with the gap.

Our analysis show that the average Gini coefficient of the Asia-Pacific countries increased from 42.2 in 2004 to 43 in 2007. The regression analysis suggests that the labor share in GDP has a negative association with the Gini. This means that a lower labor share is associated with a higher Gini coefficient. Our regression results also indicate that the rise in human capital, through increasing years of schooling and returns to education, can reduce inequality. A higher tax to GDP ratio can also be associated with a lower Gini. Remittances have a positive effect in reducing inequality in Asia and Pacific. However, the potential benefit of remittances can be undermined due to high remittance costs and high costs of recruitment of migrants, which can see migrants and their families falling into debt. Higher technological development is associated with the rise in inequality in the Asia-Pacific countries. Our regression results also show that a higher share of military expenditure in GDP would be associated with worsened inequality.

As COVID-19 is going to have some important implications for the labor market in terms of job and income losses, our study proposes that three priority areas need attention to deal with the situation. First, the availability of effective vaccines and the vaccination of most people are critical for sustained recovery. At the same time, the enforcement of the rules and regulations related to hygiene practices is vital. Second, the governments' stimulus packages to revive the economy should be implemented more effectively and expanded if necessary. An assessment is needed to understand the challenges and constraints in implementing the stimulus packages to re-design and re-target these packages. Third, it is necessary to take policies and strategies targeting the labor market. The governments should introduce relevant social protection programs in line with the ongoing labor market challenges, especially in urban areas.

Finally, we argue that the widening income inequality in many Asia-Pacific countries emphasizes the need to understand the causes of growing inequality and to undertake appropriate policies to narrow the income gap. Two related major instruments of government policies are very relevant for addressing challenges related to widening income inequality. These two instruments are revenue generation (especially tax and non-tax revenue), and public expenditure on social sectors (especially education, health, and social protection).

1. Introduction

In recent decades there has been a growing interest around functional income distribution (Krueger, 1999; Gollin, 2002; Bentolila and Saint-Paul, 2003; EC, 2007; IMF, 2007; Daudey and Garcia-Penalosa, 2007; ILO, 2008; Atkinson, 2009; Smeeding and Thompson, 2010; Bond and Harding, 2011). The functional income distribution determines how output is distributed among the factors of production, such as capital and labor. Labor remuneration, expressed as a share of value added or GDP, is known as the labor share and the residual is, therefore, the capital share (Dünhaupt, 2013).

The interest on functional income distribution has grown into concern with the upsurge of the recent global economic crisis, and many countries experiencing millions of jobs losses, raising unemployment rates to all-time highs. The labor income share has also captured attention, including outside the academic debate, particularly as an inequality measure. The measure is included as an indicator to assess progress towards the United Nations Sustainable Development Goals (ILO, 2019).

Studies have focused on the channels related to international trade and technological progress influencing employment, wages, and the labor share (Harrison, 2002; Bentolila and Saint-Paul, 2003; Guscina, 2006; Ellis and Smith, 2007). Studies have also indicated other factors such as the economic growth, foreign direct investment, and social policies (Guerriero and Sen, 2012).

In addition to these studies, our work is also inspired by new research into aspects of inequality, especially by Piketty (2014) and Milanovich (2018). In advanced countries since the 1980s, with weakening bargaining power of labor and growing share of owners of capital and an emerging class of people who derive income from both labor and capital, policy implications emerge over and beyond the old issues of redistribution. These implications are reinforced by assortative mating and unequal intergenerational investments. However, some recent assessments argue that the labor market is shaping up to be more friendly to workers in the advanced economies, which could reverse this trend (Economist, 2021). Our work will also assess the merits of these arguments.

The center of global economic activity is shifting rapidly towards Asia, driven by a combination of the economic dynamism of the People's Republic of China, India, and several other middle-income Asian countries, and sluggish growth in the OECD economies. The rapid growth and rising global prominence of Asia have raised a range of major challenges for the region and for the rest of the world.

According to ESCAP (2018), inequality in Asia and the Pacific is on the rise. Many countries, including those held up as models of dynamism and prosperity, have experienced a widening of existing gaps. Market-led growth alone is not sufficient to deliver a prosperous, sustainable future for all. The ESCAP (2018) report found that unequal access to basic opportunities left large groups of people behind and contributed to widening inequalities of outcomes, particularly in income and wealth. In turn, these inequalities aggravated inequalities in access to health care, education, technology, and protection from natural disasters and environmental hazards – creating hardship for communities and families over generations.

Against this backdrop, the main objective of this paper is to present an analysis of the trend and patterns of the share of labor in GDP in countries of Asia and the Pacific region, identify policy-relevant stylized facts, analyze the reasons behind observed trends, identify possible drivers and expected future changes in the labor share and in inequality, and assess the relationship between labor's share in GDP and inequality. This paper applies statistical analysis and relevant econometric models to generate evidence in an analytically systematic manner.

The paper proceeds as follows. In section 2 we discuss the literature on the determinants of functional income distribution. Section 3 presents an analysis on the status and trends and the factors affecting the trends of labor share in GDP in the Asia-Pacific countries. Section 4 explains the trends of labor productivity, wage, and the gap between productivity and wage in the Asia-Pacific Countries and the factors affecting the gap. Section 5 analyses trends of inequality in the Asia-Pacific Countries, the relation between labor share in GDP and inequality in the Asia-Pacific Countries and associated determining factors. Finally, concluding remarks are derived in section 6.

2. Review of Literature

The processes of globalization, in the forms of trade, global value chain and foreign direct investment, have important implications for the labor share in GDP.

Dominant trade theories looked at the gains from trade and the distribution of gains between labor and capital. Also, empirical studies on trade liberalization explored the experiences of trade policy reform in the developing countries and their implications for personal and functional income distribution.

The static 'gains from trade' theories saw trade bringing benefits to both capital and labor in the trading countries. Three complementary variants of these theories are dominant in the trade literature. The most influential 'gains from trade' theory is the classical Ricardian theory of comparative advantage. This theory argued that countries were different in factor productivity, and specialization in consumption and production would diverge with international trade. Therefore, the country which had a comparative advantage in producing any commodity would export that commodity. Extending the classical comparative advantage trade theory, the Heckscher-Ohlin-Samuelson theorem postulated that since countries had different factor endowments and different factor intensities across goods, the country abundant in labor would export labor-intensive commodities and the country abundant in capital would export capital-intensive commodities. Finally, the theory of vent for surplus (Myint, 1958) argued that, as factors of production were frequently under-utilized in the low-income economies, trade would bring the opportunity of creating incomes for unemployed factors of production. Thus, a developing country might be able to gain by exporting the products of factors that would not be employed at all without trade.

Such claims by the 'static gains from trade' theories, however, were challenged by the 'structuralist' theories on trade which developed during the 1950's and the 1960's (Prebisch, 1950; Singer, 1950; Nurkse, 1962; Vernon, 1966). According to the structuralist theories, the

industrialized countries were specialized in the production of the income-elastic manufactured goods, while most of the developing countries were the primary commodity producing countries. As primary products were income inelastic, increases in per capita incomes in the rich countries would not significantly increase the demand for primary commodities imported from the developing countries (Nurkse, 1962). Trade would, therefore, act as a source of impoverishment in the developing countries, and the real producers/exporters and labor in the developing countries would gain a little from international trade (Singer, 1950).

As an extension of the 'structuralist' theories, Vernon (1966) in his 'product cycle theory' argued that there was a substantial technological gap between the developed and developing countries. As innovation of new products took place in the developed countries and this determined the pattern of international trade, this theory recognized the possibility of developing countries exporting manufactured commodities, but only at the stage when products would be well established. Thus, the profit margins from such standardized exports were lower compared to those from the exports of 'new products', the development of which remained in the hands of developed countries.

The ideas of 'structuralist' theories were rejected by the new orthodoxy of trade liberalization, which emerged during the late 1970's and early 1980's. The new orthodoxy emphasized the importance of comparative advantage and free trade for the attainment of overall efficiency, at both the national and global levels (Bhagwati, 1978, 1987; Balassa, 1990). It was also argued that the promotion of exports would generate several benefits for the liberalized economy which included higher export productivity because of international competitive pressures, exploiting the benefits of operating in enlarged markets, and exploiting different forms of externalities (Bhagwati, 1987).

In contrast to the new orthodoxy, the literature on 'new trade theories', emphasized issues, such as learning, scale, market structure, externalities, and institutional influences on trade performance (Brander and Spencer, 1985; Krugman, 1986; Rodrik, 1988). The 'new trade theories' suggested that, because of the important roles of economies of scale, advantages of experience and innovation, it seemed more likely that labor and capital would earn significantly higher returns in some industries than in others. A whole range of arguments for intervention or 'selective' protection emerged from the 'new trade theories' (Rodrik, 1988; Pack and Westphal, 1986; Lall, 1990).

Against the backdrop of the theories, the findings of empirical literature remained inconclusive when it comes to the processes of globalization, in the forms of trade liberalization, foreign direct investment and global value-chain, and their impacts on income distribution. Though globalization is argued to raise the level of income and foster the national economy, its specific effect on labor and its overall distributional impact is controversial, given that not all groups of the society are able to take advantage of its benefits (Wood, 1994; Robbins, 1996; Dollar and Kraay, 2001; Sen, 2001; Harrison et al 2011). A limited number of studies, however, attempted assessing the impact of globalization on the labor share (Harrison, 2002; Guscina, 2006; EC, 2007; IMF, 2007; Suzuki et al, 2019). These studies, using computed indices of labor share in GDP, showed a declining trend of labor share and explored

the factors behind the trend. Suzuki et al (2019) found that trade openness is negatively correlated with the labor income share.

Guerriero and Sen (2012) summarized three hypotheses on the effect of globalization through the global value chain and the process of outsourcing on the labor share. First, as proposed by Jayadev (2007), when firms reallocate capital to other countries for production, they outsource labor intensive production to countries with lower wages and consequently decrease domestic demand of labor and the labor share. Second, as proposed by Krugman (2008), when companies in industrialized economies offshore some of their activities to the South, developing countries take over only labor-intensive portions of skilled-intensive industries, so no substantial change would occur in the pattern of trade and specialization of developed and developing economies suggested by mainstream theory. Third, as argued by Grossman and Rossi-Hansberg (2008), off-shoring and trade in intermediates can be Pareto-improving phenomena, generating productivity-enhancing effects for domestic labor, accelerating innovation, and improving welfare.

That FDI modifies the factor distribution of output in the host country is ubiquitous in the literature. Most of the papers focus on wage inequality and display mixed evidence in favor of the thesis that FDI causes wage inequality, either at industry level or country level. Important theoretical contributions include Liang and Mai (2003), Marjit et al (2004), and Das, 2005. Decreuse and Marrek (2015) addressed the effects of FDI on the labor share in developing countries. Their theory relied on the impacts of FDI on wage and labor productivity in a frictional labor market. FDI has two opposite effects on the labor share: a negative one originated by technological advance, and a positive one due to increased labor market competition between firms. The net effect would depend on the relative strength of these two opposite effects.

Empirical literature also looked at other factors affecting the labor share in GDP. These are technological development, structural transformation, social policies, and labor market institutions.

Technological change seems to have boosted the returns to capital while depressing the returns to labor (IMF, 2001; Acemoglu, 2002; Bentolila and Saint-Paul, 2003). It is generally argued that since the early 1980s, technological change has become capital-augmenting, rather than labor-augmenting (Bentolila and Saint-Paul, 2003; Guscina, 2006; Lawless and Whelan, 2011). The introduction of Information and Communication Technologies (ICTs) and other new technologies contributed to the decline of the labor share around the world (IMF, 2001; Ellis and Smith, 2007²). O'Mahony et al (2019) argued that in the long run, productivity upgrades and information and communication technology capital diffusion were the major sources of the decline in the labor share. There are also counterarguments related to the impact of technology on the labor share. While machinery generally substitutes unskilled labor, it also complements skilled labor, and therefore, with the introduction of new machines and new technology, extra training and learning for those people who have to work with them lead to an increase in their levels of education and their labor productivity (IMF, 2007).

² Ellis and Smith (2007) proposed the hypothesis that technological progress and mechanization in ICT-related capital goods, increased the rate of depreciation and obsolescence of capital goods, putting firms in a stronger bargaining position compared to the labor force.

Therefore, it is not clear what the overall impact on labor would be (Arpaia et al, 2009). For example, the empirical works by Das (2019) pointed to a dominant role of both technology and globalization, although to very different degrees in developed versus developing Asian economies. While technological progress was the key driver in advanced Asia, with globalization playing a smaller contributing role, in developing Asia, the evolution of labor shares was driven predominantly by the forces of globalization, with a very limited role for technology.

The level of economic development is one of the most important determinants of the labor share (Lewis, 1955; Kravis, 1959; Kuznets, 1955). As poor economies are dominated by a traditional agricultural sector with very low wages and a big surplus of labor (Lewis, 1955), the few capitalists in the modern sector can hire labor at minimal wages; therefore, productivity gains are not compensated by wage increases (Jayadev, 2007; Maarek, 2010; Ortega and Rodriguez, 2006), and the labor share remains at very low levels. As the economy develops, productivity increases, and greater segments of the workforce start moving from the traditional agricultural sector into positions of organized wage labor in the modern sector. Wages will rise, as well as employment, because of the presence of unlimited supply of labor: an increasingly larger share of income will be earned by workers as opposed to entrepreneurs (Kravis, 1959; Kuznets, 1955). However, with the economy growing more and more, the mechanism will necessarily reduce its magnitude and other dynamics will come into place: the effect of rising wages is stronger for low levels of development (Daudey and Garcia-Peñalosa, 2007). Suzuki et al (2019) found that the relationship between the process of structural transformation and labor income share was at best mixed. Their study found weak evidence that skill-biased structural transformation was likely to be positively correlated with the share of labor income predominantly in the services sectors.

Studies by Diwan (2001), Daudey and Garcia-Peñalosa (2007), and Luo and Zhang (2010) showed that the labor share would be affected by the amount of human capital that workers possess. Higher educational attainment influences labor through its effect on wages and employment. An increase in the level of human capital, raising the levels of wages and employment, is expected to increase the numerator of the share (Daudey and Garcia-Peñalosa, 2007).

In the case of labor market institutions, studies argued that pro-worker labor institutions have an important and positive redistributive role in the economy, restoring the equilibrium between capital and labor, and counteracting possible negative effects generated by asymmetries in economic power between workers and employers (ADB, 2005; EC, 2007). Related to the discussion on pro- worker labor institutions, the empirical analysis of Guerriero (2019) showed that democracy allowed workers to appropriate a higher share of national income. However, labor regulations may produce ambiguous effects on employment (Nickell and Layard, 1999; Besley and Burgess, 2004) and poorly designed institutions may generate 'perverse' effects, given that they impact only on the organized sector of the economy (Dougherty, 2008). Also, the stratification of labor can have strong implications on measured labor income and labor share, beyond institutions. A small share of workers with extremely high human capital (or other means of ensuring extremely high labor income) may distort the overall picture (ILO, 2019).

3. Status and Trends of Labor Share in GDP in the Asia-Pacific Countries

This section presents the status and trends of labor share in GDP in the Asia-Pacific countries. The ILO database³ provides the calculated data of the labor share in GDP for 189 countries for the period 2004-2017. In this ILO database, there are data for 39 Asia-Pacific countries. The methodology of the calculation of labor share in GDP by ILO (2019) is presented in Box 1.

Box 1: Methodology of calculation of labor share in GDP by ILO

Labor income is the amount that employed people earn by working. Economists use this concept to distinguish it from capital income. Owners of assets earn capital income due to their property. Assets include land, machines, buildings or patents. Labor income includes the wages of employees and part of the income of the self-employed. Self-employed workers earn from both their work and capital ownership.

Labor income data is key to understanding inequality. In 2018, 58% of adults worldwide were employed. So, labor income shapes the lives of 3.3 billion workers and their families. Moreover, for many, their work is a key source of income. In contrast, studies show that capital income disproportionately benefits the affluent. Therefore, labor income data can bring new insights to understanding inequality. Furthermore, topics like automation, the gig economy, or globalization have a strong link with labor income statistics.

The ILO Department of Statistics published the first ever international labor income share and distribution estimates. The Labor Income Share and Distribution dataset covers 189 countries.

While the estimation of labor income of wage laborers is straightforward, the main problem relates to estimating the—not directly observed—labor income of the self-employed. Self-employment constitutes half of the global workforce and, given the negative relationship observed between self-employment and national income, these measurement problems have been highlighted mostly in developing countries. Nonetheless, the need to account for self-employment is widely acknowledged even in high income countries. This is the reason for the existence of two measures: the adjusted labor income share (adjusted for self-employment) and the unadjusted labor income share.

Two main strategies are frequently used to adjust the labor income share: the mixed income approach and the self-employment approach. The mixed income approach is based on splitting the income of the self-employed, as measured by the national accounts mixed income item, between capital and labor. The second adjusts the labor income based on the “compensation of employees” item of national accounts and on the self-employment rate in a given economy. Both approaches are widely used and present strengths and weaknesses. The first approach has as main limitations the measurement problems of mixed income and the split of the self-employment income between labor and capital. The main limitation of the self-employment approach is how to assign an amount of labor income to the self-employed, relative to the labor income of employees. Since the choice of the relative labor income of the self-employed can be informed with microdata, while the mixed income measurement problems are not straightforwardly fixed, the focus of the ILO exercise is on the second method: the self-employment approach. Regardless of the data source used to do the adjustment, the literature has overwhelmingly favored a rule of thumb approach to estimate the self-employed income.

Taking advantage of a standardized microdata repository, the ILO Harmonized Microdata collection, the methodology pioneered by Young (1995) is extended to substitute the rules of thumb by a (micro) data-driven approach. This type of exercise has often been characterized in the literature as a best practice, but largely unattainable at the international level due to data constraints. With this new collection of harmonized microdata, the results for 95 countries can be directly estimated. The estimation of the relative labor income of the self-employed is based on the observable characteristics of those workers and how they compare to employees. Relevant variables, such as economic sector, occupation, education, and age, are used in a regression setting to study the determinants of labor income of employees. Based on the estimated relationship between labor income of employees and the explanatory variables, labor income is extrapolated

³ <https://ilostat.ilo.org/topics/labour-income/>

to the self-employed. Additionally, a correction procedure is implemented to reduce the effect of selection bias in self-employment. Afterwards, the relative labor income can be directly computed by aggregating across the work force. The estimates of labor income for self-employment are highly heterogeneous across countries, over time, and within self-employment categories, thus the use of popular rules of thumb is prone to severe limitations. The results of the exercise suggest that using rules of thumb underestimates adjusted labor income shares in developed countries, whereas in developing countries the opposite is true. Furthermore, given the prevalence of self-employment in poorer countries, the assumption of a rule of thumb for self-employment labor income completely drives the results of the estimation in these countries. Therefore, such estimates are not only affected by bias; they are almost determined ex-ante, greatly lowering their informational value. In contrast, the microdata approach derives results from labor income patterns observed in the data, such as how earnings change as a function of economic sector. The methodology outlined is not only limited to countries with available microdata, due to the imputation of missing data. The results show that there are exploitable patterns across national income, self-employment rate, and detailed status in self-employment, which allow to avoid rules of thumb even in countries with no microdata.

Source: ILO (2019)

According to ILO (2019), in 2017, the global labor income share was 51.4 percent. The ILO data showed that the capital share increased in the recent years. Though, most of the global income was still labor income, this income was distributed very unevenly. In 2017, the top 10 percent workers earned 48.9 percent of the labor income and the bottom 50 percent workers earned only 6.4 percent of the labor income (ILO, 2019).

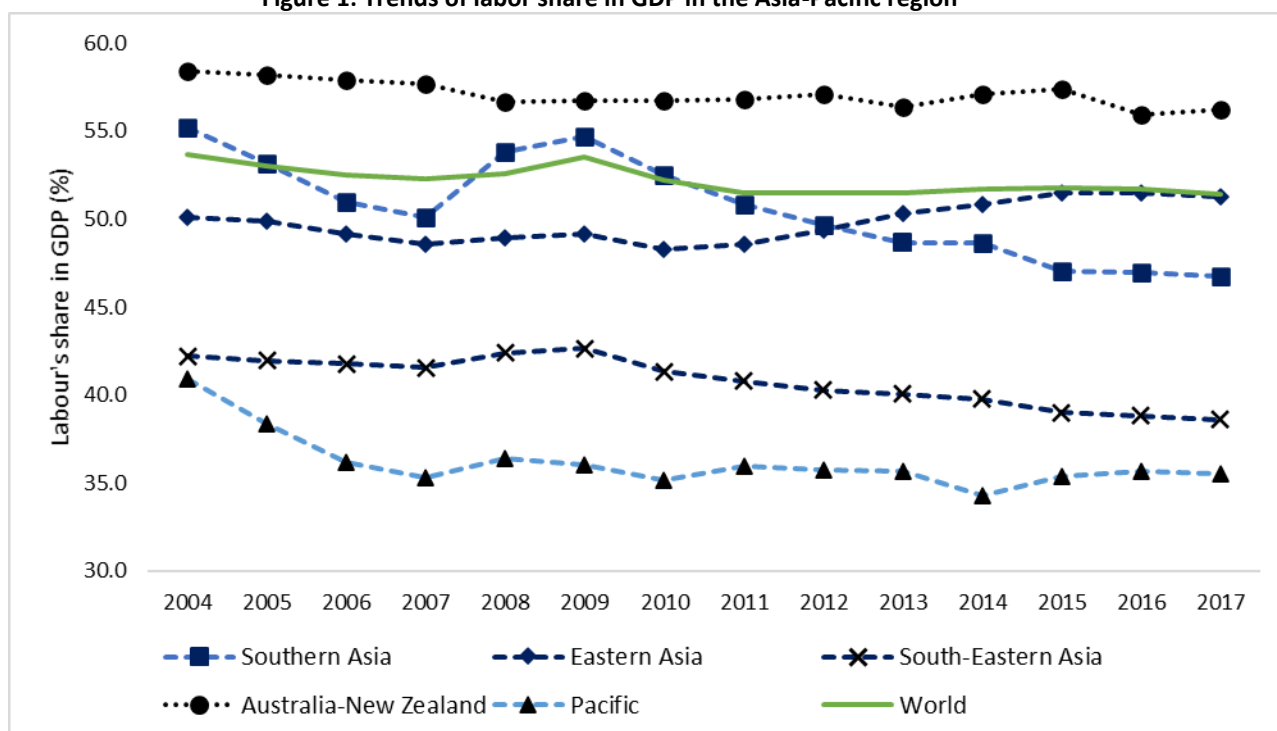
3.1. Trends of labor share in GDP by sub-regions in the Asia-Pacific

This section presents analysis on labor share in GDP at both the country and sub-regional levels for the Asia-Pacific countries. To have a better understanding of the differences in trend and pattern at the sub-regional levels, the Asia-Pacific countries are grouped into five sub-regions:

- Southern Asia: Afghanistan; Bangladesh; Bhutan; India; Iran (Islamic Republic of); Maldives; Nepal; Pakistan; Sri Lanka
- Eastern Asia: China; Hong Kong, China; Macao, China; Taiwan Province of China; Republic of Korea, Democratic People's Republic of Korea; Japan; Mongolia
- South-Eastern Asia: Brunei Darussalam; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Myanmar; Philippines; Singapore; Thailand; Timor-Leste; Viet Nam
- ANZ: Australia; New Zealand
- Pacific: Fiji; New Caledonia; Papua New Guinea; Solomon Islands; Vanuatu; Guam; French Polynesia; Samoa; Tonga

Figure 1 presents the trends of labor share in GDP by sub-regions in the Asia-Pacific. The sub-regional averages are the population-weighted averages of the respective country figures in the specific sub-regional groupings. In addition, in Figure 1, the trend in the average world labor share in GDP is presented. The world labor income share presents a downward trend in the period from 2004 to 2017, with a clear countercyclical behavior during the financial crisis and in its aftermath. The world average share declined from 53.7 percent in 2004 to 51.4 percent in 2017.

Figure 1: Trends of labor share in GDP in the Asia-Pacific region



Source: Author's calculation from the ILO database. <https://ilostat ilo.org/topics/labour-income/>

Except ANZ, all the sub-regions in Asia-Pacific held much lower labor shares in GDP than the world average. Among the five sub-regions of the Asia-Pacific countries, even with a declining trend, ANZ always held the highest share and its share remained much higher than the world average during all the years between 2004 and 2017. In 2004, ANZ's labor share in GDP was 58.4 percent which declined to 56.2 percent in 2017. Eastern Asia maintained the trend lower than the world average, and since 2010 Eastern Asia started converging towards the world average. Since 2015, its figure almost coincided the world average. In 2004, Eastern Asia's labor share in GDP was 50.1 percent which declined to 48.3 percent in 2010 and then increased to 51.3 percent in 2017. For the Southern Asia, between 2004 and 2007, the share declined from 55.2 percent to 50 percent and then increased to 54.7 percent in 2009. Then there had been a secular decline in the share from 54.7 percent in 2009 to 46.7 percent in 2017. South-Eastern Asia also registered secular decline between 2009 and 2017. In 2004, South-Eastern Asia's labor share in GDP was 42.2 percent which declined to 38.6 percent in 2017. Similarly, Pacific's labor share in GDP declined from 40.9 percent in 2004 to 35.5 percent in 2017.

In Figure 1, the effect of global financial crisis on the labor income share is evident for all the sub-regions and most prominently for Southern Asia. Though all the sub-regions experienced the fall in labor income share, the fall is mostly visible for Southern Asia (driven primarily by India). The factors behind the sub-region-wide differences can be understood better by looking at the country level trends and patterns. We discuss the factors behind such country-wise differences in a systematic way by employing econometric models in Section 3.2.

Table 1: Country-wise labor share in GDP and ranking of Asia-Pacific countries between 2004 and 2017

Country	2004		2017	
	Labor share (%)	Rank	Labor share (%)	Rank
Southern Asia	55.2		46.7	
Afghanistan	46.3	20	44.6	22
Bangladesh	45.4	24	42.2	25
Bhutan	45.7	22	45.2	21
India	60.7	2	49.0	15
Iran (Islamic Republic of)	32.3	36	36.2	35
Maldives	43.2	27	41.0	29
Nepal	41.0	29	37.1	33
Pakistan	40.8	30	42.2	26
Sri Lanka	33.9	33	37.1	34
Eastern Asia	50.1		51.3	
China	49.9	12	51.3	8
DPR Korea	29.9	38	29.6	38
Hong Kong, China	55.7	4	54.0	4
Japan	54.6	6	54.2	3
Macao, China	27.9	39	31.7	36
Mongolia	33.1	34	41.4	28
Republic of Korea	54.9	5	53.8	5
Taiwan Province of China	52.2	8	52.5	6
South-Eastern Asia	42.2		38.6	
Brunei Darussalam	47.6	17	47.9	17
Cambodia	44.5	25	37.6	32
Indonesia	41.5	28	38.1	31
Lao PDR	53.6	7	49.7	12
Malaysia	31.5	37	41.8	27
Myanmar	46.4	19	44.4	23
Philippines	33.0	35	26.6	39
Singapore	45.6	23	49.2	13
Thailand	49.7	15	48.2	16
Timor-Leste	48.4	16	46.8	18
Viet Nam	47.1	18	40.5	30
Australia-New Zealand	58.4		56.2	
Australia	59.9	3	57.2	2
New Zealand	50.9	9	51.2	9
Pacific	40.9		35.5	
Fiji	40.4	31	45.5	20
French Polynesia	50.2	10	51.2	10
Guam	49.9	13	51.2	11
New Caledonia	50.0	11	51.5	7
Papua New Guinea	38.3	32	30.7	37
Samoa	43.8	26	43.7	24
Solomon Islands	49.8	14	49.1	14
Tonga	46.2	21	45.7	19
Vanuatu	71.2	1	67.4	1
World	53.7		51.4	

Note: Rank among 39 Asia-Pacific countries. The higher the position in the ranking means higher the share

Source: Author's calculation from the ILO database. <https://ilostat.ilo.org/topics/labour-income/>

Table 1 presents a summary of the change in the share between 2004 and 2017 and the relative ranking among the Asia-Pacific countries. While 25 countries, among the 39 Asia-Pacific countries listed in Table 1, experienced the fall in labor share between 2004 and 2017,

14 countries improved their shares. In 2017, among the 39 Asia-Pacific countries, the highest labor share in GDP was for Vanuatu (67.4 percent) and the lowest share was for Philippines (26.6 percent). While most of the countries maintained similar rankings during 2004 and 2017, major changes in rankings occurred for Cambodia, Fiji, India, Malaysia, Mongolia, Singapore and Viet Nam.

In the case of Southern Asia, both in 2004 and 2017, except India, all countries had lower labor share in GDP compared to the world average. India had a figure higher than the world average in 2004, but by 2017 India's share became lower than the world average. Among the Southern Asian countries, the highest labor share in 2017 was in India and the lowest was in Iran. However, Iran, Pakistan, and Sri Lanka managed to improve their labor share in GDP in 2017 compared to their respective figures in 2004. The sharp decline in the labor share in India has been related to trade openness. Trade, by dampening the bargaining power of labor, reduced the labor share (Maiti, 2019). Although the export-oriented readymade garments industry, which employed many female workers, flourished in Bangladesh the bargaining power of garments workers didn't increase much. Trade union or other labor organizations have not been allowed in the RMG industry in Bangladesh and wage remained suppressed for decades (Raihan, 2020). In other South Asian countries too, the much lower levels of labor share, in comparison to the world average, indicate that while most of the South Asian countries experienced high economic growth followed by increased openness and economic liberalization, real wages didn't increase much in tandem.

In 2004, among the eight Eastern Asian countries, only Hong Kong (China), Japan and Republic of Korea had labor income share higher than the world average. In 2017, while Hong Kong (China), Japan and Republic of Korea held higher shares than the world average, and so did Taiwan Province of China. In contrast, in 2017, China, DPR Korea, Macao (China) and Mongolia registered lower share than the world average. Among the Eastern Asian countries, between 2004 and 2017, while China, Macao (China), Mongolia and Taiwan Province of China increased their shares, DPR Korea, Hong Kong (China), Japan, and Republic of Korea experienced a fall in their shares. Taking a much longer time horizon, starting from early 1970s, China experienced a decline in the labor share in GDP. This was attributed to two major changes in power relations—the disappearing social contract between the state and workers and declining workers' power relative to management (Qi, 2019). According to Zhou (2016), the decrease in labor share in China was closely related to economic growth, increasing extent of globalization, and firms with heterogeneous characteristics. However, the labor share of GDP in China has risen sharply since 2011, reversing the trend in the previous decade of imbalanced growth. This is due to the rebalancing of China's economy where, services and consumption, rather than industry and investment, are increasingly driving growth (Huang and Lardy, 2016; Choyleva, 2018). Also, the minimum wage regulation contributed to the rise in the share of labor in China (Zhana et al, 2020).

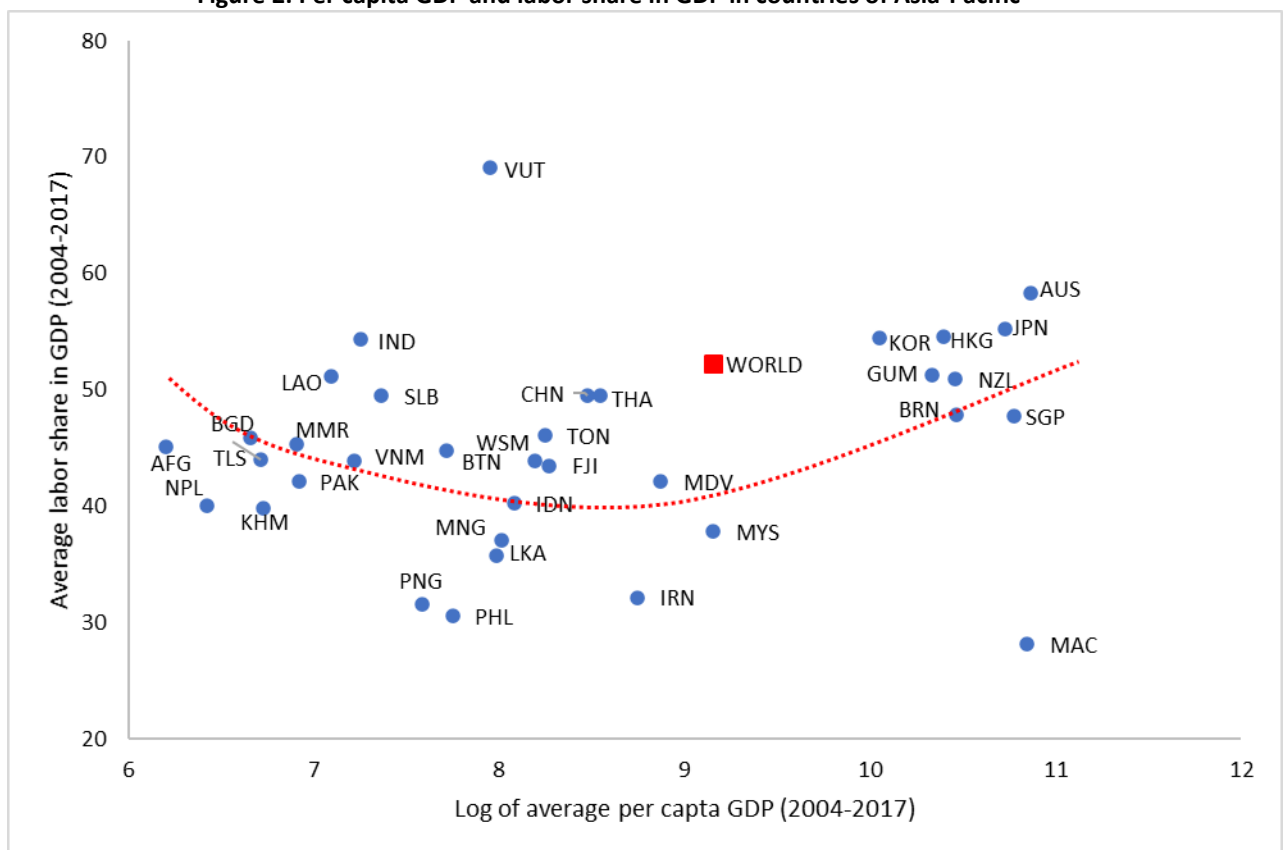
In the case of South-Eastern Asia, both in 2004 and 2017, all countries had lower than the world average of labor share. Except Brunei Darussalam, Malaysia, and Singapore, all the other countries experienced fall in the labor share between 2004 and 2017. Malaysia registered a rise of labor share from 31.5 percent in 2004 to 41.8 percent in 2017. According to Ng et al (2018), the increase in labor share in Malaysia was mainly due to the growing

importance of more traditional service subsectors and SMEs in the economy, which in turn was associated with greater reliance on low-skilled foreign workers during this period.

Compared to the world average labor share, Australia always had higher shares and New Zealand had lower shares both in 2004 and 2017. However, for both these countries, the respective labor income shares were lower in 2017 than those in 2004. Stanford (2018) argued that both the extent and the timing of the subsequent decline in labor’s share of GDP reflected the unique characteristics of neoliberalism in Australia: including the bipartisan consensus around its major features that has prevailed through most of this time. Stanford (2018) further argued that by 2017, the labor share of GDP had reached its lowest level in almost 60 years, reflecting both the longer-run structural shift in factor distribution (away from labor, and toward profits) and more cyclical and immediate factors (such as continuing fluctuations in prices for Australia’s resource exports).

Among the Pacific countries, except Vanuatu in 2004 and Vanuatu and New Caledonia in 2017, all other countries had lower figures than the world average. Out of the nine Pacific countries, while Fiji, French Polynesia, Guam, and New Caledonia increased their labor income shares, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu experienced decline in their labor shares.

Figure 2: Per capita GDP and labor share in GDP in countries of Asia-Pacific



Source: Author’s calculation from the ILO database. <https://ilostat.ilo.org/topics/labour-income/>

Figure 2 plots the average labor share in GDP (2004-2017) against the average per capita GDP (2004-2017) of the Asia-Pacific countries. There seems to be a U-shaped association, where the labor share declines with the rise in per capita GDP but increases at a high level of per

capita GDP. Vanuatu and Macao seem to be the outliers in the scatterplot. As is also evident from the scatterplot, most of the Asia-Pacific countries held average labor shares, for the period 2004-2017, much lower than the world average.

Falling labor shares also imply that wages have been growing at a slower pace than labor productivity (Dao et al. 2017). Table 2 presents a calculation of annual average productivity growth and wage growth in Asia-Pacific between 2004 and 2017 (detailed methodology of calculation of productivity and wage is presented in Section 4). On average, the Pacific had the largest gap between wage growth and productivity growth, followed by Southern Asia. The sharp decline in labor share in Southern Asia in recent years can be attributed to this. While India, the largest country in Southern Asia, had the largest average productivity growth, it had the largest gap too. Among the Eastern Asian countries, the positive gap between wage growth and productivity in China, the largest country in Eastern Asia, contributed to the very small gap for the overall Eastern Asia, though three high-income economies, Hong Kong (China), Japan, and Republic of Korea experienced slower growth of wage relative to the productivity growth. In South-Eastern Asia, though large countries (but with much lower per capita GDP than other richer countries in the sub-region) like Indonesia and Vietnam experienced much slower growth in wage compared to that in productivity, high positive contributions from Malaysia and Singapore led to a negative but lower sub-regional average. Among the Pacific countries, a large negative gap of Papua New Guinea, the largest country in that sub-region, contributed to an overall large negative gap for the Pacific.

Table 2: Annual average productivity growth and wage growth in Asia-Pacific between 2004 and 2017

	Annual average productivity growth (2004-2017)	Annual average wage growth (2004-2017)	Percentage point difference between wage growth and productivity growth (2004-2017)
<i>Southern Asia</i>	6.24	5.11	-1.14
Afghanistan	4.37	3.93	-0.44
Bangladesh	4.66	3.79	-0.87
Bhutan	7.60	7.44	-0.17
India	9.56	6.24	-3.33
Iran (Islamic Republic of)	1.90	3.06	1.16
Maldives	0.78	0.35	-0.43
Nepal	2.22	1.28	-0.94
Pakistan	1.44	1.75	0.31
Sri Lanka	6.93	8.31	1.38
<i>Eastern Asia</i>	4.88	4.72	-0.16
China	15.57	16.22	0.65
Hong Kong, China	2.90	2.58	-0.32
Japan	0.41	0.35	-0.06
Macao, China	2.50	3.89	1.39
Mongolia	6.12	9.58	3.46
Republic of Korea	2.84	2.63	-0.21
<i>South-Eastern Asia</i>	4.11	3.72	-0.39
Brunei Darussalam	-1.07	-1.02	0.04
Cambodia	6.32	4.14	-2.17
Indonesia	4.37	3.38	-0.99
Lao PDR	8.60	7.41	-1.19
Malaysia	2.39	5.69	3.30

	Annual average productivity growth (2004-2017)	Annual average wage growth (2004-2017)	Percentage point difference between wage growth and productivity growth (2004-2017)
Myanmar	13.59	12.67	-0.92
Philippines	4.69	2.29	-2.40
Singapore	1.79	2.53	0.75
Thailand	3.44	3.11	-0.34
Timor-Leste	2.30	1.97	-0.33
Viet Nam	5.48	3.64	-1.85
Australia-New Zealand	0.85	0.52	-0.34
Australia	0.84	0.45	-0.38
New Zealand	0.82	0.87	0.05
Pacific	4.13	2.44	-1.70
Fiji	2.34	3.61	1.27
Guam	0.42	0.63	0.21
Papua New Guinea	7.59	4.56	-3.03
Samoa	1.00	0.98	-0.02
Solomon Islands	2.16	2.02	-0.14
Tonga	2.74	2.62	-0.11
Vanuatu	0.72	0.27	-0.45
World	1.88	1.47	-0.41

Source: Author's calculation using data from the World Bank, World Development Indicators, PWT 10.0 and the ILO database. <https://ilostat ilo.org/topics/labour-income/>

Das (2019) argued that the slower growth of wage relative to productivity phenomenon can have a range of macroeconomic implications, including on aggregate demand and wage inequality. Increases in the capital share at the expense of the labor share raise income inequality because capital holdings tend to cluster in the upper tail of the income distribution. Furthermore, if the labor share reduction is more significant in the unskilled sector, the income disparity will increase even more. Changes in factor shares have implications not only for income distribution but also for fiscal policy design. Lower-income families, for example, have a larger marginal propensity to consume, so a lowering labor share can stifle aggregate demand growth.

3.2. Factors affecting the trends of labor share in GDP

To explain the reasons for observed trends in the share of labor in GDP, in line with Guerriero and Sen (2012), a cross-country panel regression is employed, and appropriate estimation method is applied. The tentative estimation model is as follows where the labor share in GDP is a function of several explanatory variables under different specifications:

$$lab_sr_{it} = f \{ trd_sr_{it}, \log(pc_fdi)_{it}, edu_{it}, \log(pc_gdp)_{it}, \log[(pc_gdp)^2]_{it}, nagemp_sr_{it}, tech_{it}, lab_ins_{it}, r_dummies \} \quad (1)$$

where i and t designate country and time respectively.

lab_sr = labor share in GDP (from the ILO database⁴)

⁴ <https://ilostat ilo.org/topics/labour-income/>

<i>trd_sr</i>	= trade share in GDP (from the World Bank, World Development Indicator Database ⁵)
<i>pc_fdi</i>	= per capita foreign direct investment inflow (calculated from the World Bank, World Development Indicator Database)
<i>edu</i>	= average years of schooling (from the UNDP ⁶)
<i>pc_gdp</i>	= real GDP per capita (from World Bank, World Development Indicator Database)
<i>nagemp_sr</i>	= share of non-agricultural employment in total employment (calculated from the World Bank, World Development Indicator Database)
<i>tech</i>	= an index of technology and innovation (from Global Competitiveness Index). Higher value means higher technological development
<i>lab_ins</i>	= an index of the strength of labor market institutions (from Global Competitiveness Index). Higher value means stronger labor institutions
<i>r_dummies</i>	= dummies for four sub-regions (Southern Asia, Eastern Asia, South-Eastern Asia, and Pacific while considering ANZ base the base)

We ran both the fixed effect (FE) and random effect (RE) models. Both the FE and RE models account for time fixed effects over the T years including $T-1$ year dummy variables in the regressions model. The motivation is that time common trends and annual specific shocks might affect the investigated relationships. Moreover, robust standard errors are used (White, 1980), to correct for the presence of heteroskedasticity of the residuals, after performing a test for group-wise heteroskedasticity on the benchmark specification with year dummies (Greene, 2008). In the FE model, country fixed effects are considered. In the random-effect model, sub-regional dummies are added. To include the technology and labor market institution variables, as the data is available for 25 countries for a limited number of years, we ran a separate regression for these two variables under different specification.

Total trade as a percentage of GDP is a standard and frequently used proxy for openness to trade used in the cross-country panel regression models (Sachs and Warner, 1995; Rama, 2003). FDI can also have an important implication for the labor share (Decreuse and Maarek, 2015). To measure the level of education, we use average schooling years in the total population aged 25 or over (Barro, 1991; Barro and Sala-i-Martin, 2004; Barro and Lee, 2010; Wood and Riddo-Cano, 1999). Real GDP per capita is a proxy for structural determinants correlated with levels of income. To consider the possibility of decreasing or increasing returns, the squared value of the measure is also added to the regressors. Share of non-agricultural employment in total employment is also considered. Non-agricultural sector is dominated by the services sectors. Aum and Shin (2020) argued that the declining trend of labor share coincided with the rapid rise of software investment, which left a larger impact on service industries and on high-skill, cognitive occupations (than middle-skill, routine occupations). As discussed in Section 2, technology and labor market institution have important implications for the differences in labor share in GDP across countries and over time.

⁵ <https://databank.worldbank.org/source/world-development-indicators>

⁶ <http://hdr.undp.org/en/data>

Table 3 presents the regression results of FE and RE models. Both these models consider trade, FDI, education, per capita GDP and its squared value, and non-agricultural employment as the explanatory variables. Each of these regressions uses a balanced panel dataset for maximum of 33 Asia-Pacific countries with the 14 years span. Therefore, the panel dataset has a total of 462 observations. The six countries, for which data on most of the explanatory variables in equation 1 is not available, are DPR Korea; French Polynesia; Guam; Macao, China; Taiwan Province of China; and Tonga. The results of FE and RE models are similar. However, the Hausman test suggests the supremacy of FE model over the RE model.

Table 3: Cross-country panel regression of labor share in GDP for the Asia-Pacific countries

Variables	Fixed Effect model	Random Effect Model
	lab_sr	lab_sr
trd_sr	-0.031*** (0.005)	-0.026*** (0.004)
lpc_fdi	-0.179* (0.099)	-0.176* (0.099)
edu	0.423** (0.195)	0.323* (0.188)
lpc_gdp	-12.943*** (4.046)	-16.329*** (3.548)
l(pc_gdp) ²	0.871*** (0.249)	1.145*** (0.208)
nagemp_sr	-0.169*** (0.039)	-0.177*** (0.037)
Constant	103.130*** (15.389)	112.656*** (14.047)
Year dummies	Yes	Yes
Fixed effect	Yes	No
No. obs.	462	462
No countries	33	33
R-squared	0.2244	0.2188
Prob > F	0.000	0.000

Source: Author's calculations

Note: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

In Table 3, results from the FE regression model show that the explanatory variables, related to trade, FDI, education, per capita GDP and its squared value, and non-agricultural employment, are statistically significant. One percentage point rise in the trade-GDP ratio is associated with 0.031 percentage points fall in the labor share in GDP. Also, a doubling of the per capita FDI is associated with 0.179 percentage points fall in the labor share in GDP. In the case of education, an increase in the average years of schooling by one year is associated with 0.423 percentage points rise in the labor share in GDP. Moreover, a doubling of the per capita GDP is associated with 12.9 percentage points fall in the labor share in GDP. The squared value of per capita GDP has a positive coefficient indicating an increasing return at the higher level of per capita GDP. Finally, one percentage point rise in the non-agricultural employment share is associated with 0.169 percentage points fall in the labor share in GDP.

Table 4 presents the regression results involving the technology and labor market institution variables in the cross-country panel regression. Here, based on the Hausman test, we have reported only the FE model results. This regression is conducted involving the available data of 25 Asia-Pacific countries for 11 years. The number of observations is thus reduced to 275

compared to 462 as reported in Table 3. Under this modified specification, it appears that, compared to the results reported in Table 3, the signs of the coefficients of variables in Table 4 remained unchanged. The technology variable has a negative and significant association with the labor share, and a unit increase in the technology index is associated with 0.851 percentage points fall in the labor share in GDP. Finally, the labor market institution variable has a positive and significant association with the labor share, and a unit increase in the labor institution index is associated with 0.649 percentage points rise in the labor share in GDP.

Table 4: Technology and labor market institution in the cross-country panel regression of labor share

Variables	Fixed Effect model
	lab_sr
trd_sr	-0.025*** (0.006)
lpc_fdi	-0.304** (0.143)
lpc_gdp	-20.790*** (6.646)
l(pc_gdp) ²	1.371*** (0.391)
nagemp_sr	-0.101* (0.058)
tech	-0.851* (0.432)
lab_ins	0.649* (0.383)
Constant	130.667*** (25.389)
Year dummies	Yes
Fixed effect	Yes
No. obs.	275
No countries	25
R-squared	0.1902
Prob > F	0.000

Source: Author's calculations

Note: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

In Table 5, sub-regional dummies are added to the RE model of the original regression equation (reported in Table 3). While adding the four sub-regional dummies, ANZ is considered as the base. The regression results indicate that all original variables maintained their signs and significance compared to the RE estimates reported in Table 3, though the sizes of the coefficients change to some extent. The coefficients of the dummy variables for four sub-regions are insignificant suggesting that, relative to ANZ, all the four other sub-regions maintain the overall association found in the original regression.

Table 5: Sub-regional dummies in the cross-country panel regression of labor share

Variables	Random Effect model
	lab_sr
trd_sr	-0.026*** (0.004)
lpc_fdi	-0.164* (0.100)
edu	0.287* (0.168)

Variables	Random Effect model
	lab_sr
lpc_gdp	-16.173*** (3.673)
L(pc_gdp) ²	1.117*** (0.219)
nagemp_sr	-0.168*** (0.038)
d_SAsia	-5.081 (5.321)
d_SEAsia	-3.060 (5.111)
d_EAsia	2.165 (5.337)
d_Pacific	0.822 (5.526)
Constant	114.991*** (14.359)
Year dummies	Yes
Fixed effect	No
No. obs.	462
No countries	33
R-squared	0.2205
Prob > F	0.000

Source: Author's calculations

Note: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

3.3. Summary and analysis of the findings

The declining labor share in GDP and factors associated with it have important implications for the countries of the Asia-Pacific. Regression results reported in Section 3.2 suggest that trade openness and FDI have negative association with the labor share in GDP in the Asia-Pacific countries. This raises concerns about the pattern of globalization in the Asia-Pacific countries. Trade openness and FDI have not been labor friendly in most of these countries. Rowley and Benson (2000), based on the experience of the Asia Pacific countries, argued that globalization undermined labor bargaining power. Suzuki et al (2019) showed the negative impact of trade openness on the labor share in GDP in the Asian countries.

The labor share is strongly and negatively correlated with per capita GDP, which indicate that economic growth and structural transformation processes in many Asia-Pacific countries have also not been favorable in raising the labor share in GDP. Also, technological development has not been labor friendly in most of these countries, as technological advancement in the Asia-Pacific countries has been rather capital intensive. Zhuang et al (2012) argued that though technological progress, globalization, and market-oriented reform were the key drivers of Asia's rapid growth, these were also the forces behind the rising inequality in many developing countries.

Non-agricultural employment share in total employment has a negative association with the labor share in GDP. As described by Jain-Chandra et al (2016), advanced and developing economies in Asia faced different forms of duality in their labor markets, which also exacerbated income inequality. While duality kept unemployment low, non-regular workers

typically earned less, and received fewer training opportunities and lower social insurance coverage, which contributed to higher wage inequality and lower social mobility (Aoyagi and Ganelli, 2013; Dao et al, 2014; Aoyagi et al, 2015). In developing Asia, informality was the biggest driver of dual labor markets and economies, with the share of informality in non-agricultural employment being as high as 70 percent or more in India, Indonesia, and the Philippines (Gonzalez et al, 2015; Jain-Chandra et al, 2016).

Education has a positive association with the labor share in GDP. Education enhances labor productivity and wages and thus can contribute to the rise in labor share in GDP. Countries with higher level of educational achievement showed higher level of labor share in GDP. Therefore, education can be an important tool to rebalance the economic and social powers between labor and capital. Lee (2018) argued that the rising income inequality within East Asian economies in recent decades would be attributed to the un-equalizing effects of fast income growth and rapid progress in globalization and technological change, which surpassed the income-equalizing effects from improved equality in the distribution of educational attainment during the period.

Pro-worker labor institution can have a positive impact on the rise in the labor share in GDP. Ahn (2015), however, observed that the collective bargaining association (CBA) coverage in Asia was very low because of low trade union density in most of Asian countries, fragmentation of trade unions, expansion of informal economy, low coverage of CBA for agricultural workers, workers in EPZs, migrant workers, and domestic workers, and inexperience of new trade unions on negotiation and collective bargaining.

4. Trends of Labor Productivity, Wage and the Gap between Productivity and Wage in the Asia-Pacific Countries

This section explores the trend of labor productivity, wage and the gap between productivity and wage in the Asia-Pacific countries. One challenge of comparing labor productivity and wage is to have comparable data of productivity and wage across the Asia-Pacific countries.

In this exercise, we calculated labor productivity as the real GDP per employed person. Real GDP considers both formal and informal activities. However, in the standard calculation of GDP, unpaid family work is not included. Our measure of labor productivity is an average measure and doesn't reflect any adjustments made for differing hours worked across countries or for part-time work. Also, In the absence of labor productivity data from the secondary source at the aggregate level, we have computed labor productivity by dividing the GDP with the total employed persons which is, in fact, gross productivity rather than net productivity of labor.

In the absence of any comparable and consistent data for wage, we calculated the real compensation per employed person by using the data of real GDP, labor share in GDP and number of employed persons. The data for number of employed persons is taken from the Penn World Table version 10.0⁷.

⁷ <https://www.rug.nl/ggdc/productivity/pwt/?lang=en>

The rise in labor productivity is important for economic growth. From the distribution point of view, the question is whether the rise in labor productivity leads to the rise in wage and whether there is any gap between the two. In section 4.2 we make a systematic analysis of the factors behind the differences in gaps.

The calculated indicators of labor productivity and wage for the Asia-Pacific countries show that wage remained below productivity for all the countries for all the years under consideration. One important reason behind the gap between productivity and wage is that though the pace of technological progress constrains productivity growth, which also depends on where a country is compared with the world's technological frontier, catching up countries can show higher productivity growth by adopting better existing technologies than those on the frontier. In contrast, the growth of wage is constrained by the bargaining power of labor and various policies and regulations related to the labor market.

4.1. The trends of labor productivity, wage, and gap

Table 6 presents the data of labor productivity, wage, and the gap between labor productivity and wage in the Asia-Pacific countries for the years of 2004 and 2017. All the sub-regions, including the world average, registered rise in labor productivity and wage between 2004 and 2017. Labor productivity and wage of ANZ remained the highest among the five sub-regions in the Asia-Pacific. The lowest labor productivity and wage growth were observed in Southern Asia.

Table 6 also presents the gap between labor productivity and wage where the gap is calculated as the shortfall of wage from labor productivity as percentage of wage. The sub-regional averages of gaps are calculated using the weights of the population of respective countries. Between 2004 and 2017, while the gap of world average increased, four out of the five sub-regions in the Asia-Pacific also witnessed the rise in the gap. Only Eastern Asia experienced a fall in the gap, primarily due to the fall in gap in China. In 2017, the gap was the highest for the Pacific followed by South-Eastern Asia and Southern Asia, and all these three sub-regions registered higher gaps than the world average for both 2004 and 2017. ANZ always maintained lower gap than the world average, and for Eastern Asia the gap became lower than the world average in 2017. The Pacific's' high average gap is driven by the very high gap of Papua New Guinea and as Papua New Guinea constitutes around 80 percent of the population of the Pacific island countries.

Table 6: Country-wise labor productivity, wage, and gap of Asia-Pacific countries between 2004 and 2017

	Labor productivity (US\$)		Wage (US\$)		Gap between labor productivity and wage (%)	
	2004	2017	2004	2017	2004	2017
Southern Asia	3190.5	5779.4	1585.4	2637.7	87.8	115.8
Afghanistan	1329.3	2084.8	615.5	929.8	116.0	124.2
Bangladesh	1778.4	2855.7	807.4	1205.1	120.3	137.0
Bhutan	3748.2	7453.0	1713.0	3368.8	118.8	121.2
India	2433.7	5458.7	1477.3	2674.8	64.7	104.1
Iran (Islamic Republic of)	18757.3	23384.0	6058.6	8465.0	209.6	176.2
Maldives	20458.3	22527.4	8837.9	9236.2	131.5	143.9

Nepal	1142.4	1472.3	468.4	546.2	143.9	169.5
Pakistan	3358.6	3986.6	1370.3	1682.4	145.1	137.0
Sri Lanka	5304.4	10084.9	1798.2	3741.5	195.0	169.5
Eastern Asia	12600.8	20596.7	6705.4	10820.0	98.4	93.9
China	4215.2	12745.0	2103.4	6538.2	100.4	94.9
Hong Kong, China	53173.9	73240.7	29617.9	39550.0	79.5	85.2
Japan	85579.9	90112.3	46726.6	48840.9	83.2	84.5
Macao, China	69799.9	92467.2	19474.2	29312.1	258.4	215.5
Mongolia	5152.6	9250.2	1705.5	3829.6	202.1	141.6
Republic of Korea	38822.6	53178.3	21313.6	28609.9	82.2	85.9
South-Eastern Asia	5870.6	9010.1	2410.1	3575.6	141.6	167.3
Brunei Darussalam	83472.9	71901.0	39733.1	34440.6	110.1	108.8
Cambodia	1181.0	2150.6	525.5	808.6	124.7	166.0
Indonesia	5666.0	8881.5	2351.4	3383.9	141.0	162.5
Lao PDR	1611.5	3412.9	863.7	1696.2	86.6	101.2
Malaysia	19264.2	25247.7	6068.2	10553.6	217.5	139.2
Myanmar	1304.1	3607.3	605.1	1601.6	115.5	125.2
Philippines	4927.8	7934.0	1626.2	2110.4	203.0	275.9
Singapore	71229.8	87762.2	32480.8	43179.0	119.3	103.3
Thailand	7849.0	11362.4	3900.9	5476.7	101.2	107.5
Timor-Leste	1610.8	2092.7	779.6	979.4	106.6	113.7
Viet Nam	1905.9	3263.9	897.7	1321.9	112.3	146.9
Australia-New Zealand	94926.0	105459.8	55865.0	59611.1	71.9	78.2
Australia	100894.4	111906.3	60435.8	64010.4	66.9	74.8
New Zealand	65536.9	72512.8	33358.3	37126.5	96.5	95.3
Pacific	6072.4	9335.6	2577.6	3394.5	151.0	200.3
Fiji	10309.9	13447.5	4165.2	6118.6	147.5	119.8
Guam	62395.2	65791.0	31135.2	33685.0	100.4	95.3
Papua New Guinea	4109.7	8163.4	1574.0	2506.2	161.1	225.7
Samoa	12606.8	14243.8	5521.8	6224.5	128.3	128.8
Solomon Islands	2733.5	3500.9	1361.3	1718.9	100.8	103.7
Tonga	10647.3	14434.4	4919.0	6596.5	116.5	118.8
Vanuatu	6106.1	6675.5	4347.5	4499.3	40.5	48.4
World	19077.1	23730.7	10244.4	12197.6	86.2	94.6

Source: Author's calculation using data from the World Bank, World Development Indicators, PWT 10.0 and the ILO database. <https://ilostat.ilo.org/topics/labour-income/>

One explanation of the rise in gaps could be that there is a pressure in the international export market to remain competitive. Therefore, as countries participate more in the international trade, the gap might increase. Furthermore, as we discussed in the earlier section, FDI, education, per capita GDP, technology, and labor institutions can also have important implications for the differences in such gaps.

Table 7: Percentage gap of labor productivity and wage of Asia-Pacific countries from the world averages

	Percentage gap of labor productivity from world average		Percentage gap of wage from world average	
	2004	2017	2004	2017
Southern Asia	-83.3	-75.6	-84.5	-78.4
Afghanistan	-93.0	-91.2	-94.0	-92.4
Bangladesh	-90.7	-88.0	-92.1	-90.1
Bhutan	-80.4	-68.6	-83.3	-72.4
India	-87.2	-77.0	-85.6	-78.1
Iran (Islamic Republic of)	-1.7	-1.5	-40.9	-30.6

	Percentage gap of labor productivity from world average		Percentage gap of wage from world average	
Maldives	7.2	-5.1	-13.7	-24.3
Nepal	-94.0	-93.8	-95.4	-95.5
Pakistan	-82.4	-83.2	-86.6	-86.2
Sri Lanka	-72.2	-57.5	-82.4	-69.3
Eastern Asia	-33.9	-13.2	-34.5	-11.3
China	-77.9	-46.3	-79.5	-46.4
Hong Kong, China	178.7	208.6	189.1	224.2
Japan	348.6	279.7	356.1	300.4
Macao, China	265.9	289.7	90.1	140.3
Mongolia	-73.0	-61.0	-83.4	-68.6
Republic of Korea	103.5	124.1	108.1	134.6
South-Eastern Asia	-69.2	-62.0	-76.5	-70.7
Brunei Darussalam	337.6	203.0	287.9	182.4
Cambodia	-93.8	-90.9	-94.9	-93.4
Indonesia	-70.3	-62.6	-77.0	-72.3
Lao PDR	-91.6	-85.6	-91.6	-86.1
Malaysia	1.0	6.4	-40.8	-13.5
Myanmar	-93.2	-84.8	-94.1	-86.9
Philippines	-74.2	-66.6	-84.1	-82.7
Singapore	273.4	269.8	217.1	254.0
Thailand	-58.9	-52.1	-61.9	-55.1
Timor-Leste	-91.6	-91.2	-92.4	-92.0
Viet Nam	-90.0	-86.2	-91.2	-89.2
Australia-New Zealand	397.6	344.4	445.3	388.7
Australia	428.9	371.6	489.9	424.8
New Zealand	243.5	205.6	225.6	204.4
Pacific	-68.2	-60.7	-74.8	-72.2
Fiji	-46.0	-43.3	-59.3	-49.8
Guam	227.1	177.2	203.9	176.2
Papua New Guinea	-78.5	-65.6	-84.6	-79.5
Samoa	-33.9	-40.0	-46.1	-49.0
Solomon Islands	-85.7	-85.2	-86.7	-85.9
Tonga	-44.2	-39.2	-52.0	-45.9
Vanuatu	-68.0	-71.9	-57.6	-63.1

Source: Author's calculation from Table 6

Table 7 shows the calculated percentage gaps of labor productivity and wage of Asia-Pacific countries from the world averages. While the labor productivity and wage of ANZ remained considerably higher than the world averages both in 2004 and 2017, the largest gaps are observed for South Asia and lowest ones are for Eastern Asia. The sub-regional averages show that, between 2004 and 2017, Southern Asia, Eastern Asia, South-Eastern Asia and the Pacific showed improvement in closing the gap of labor productivity and wage from the respective world averages. The most visible improvement is observed for Eastern Asia, primarily due to the improvement in China. Differences among the sub-regions in terms of productivity and wage are also due to differences in the level of per capita income. While ANZ has the highest average per capita income, Southern Asia has the lowest average per capita income in the Asia and Pacific.

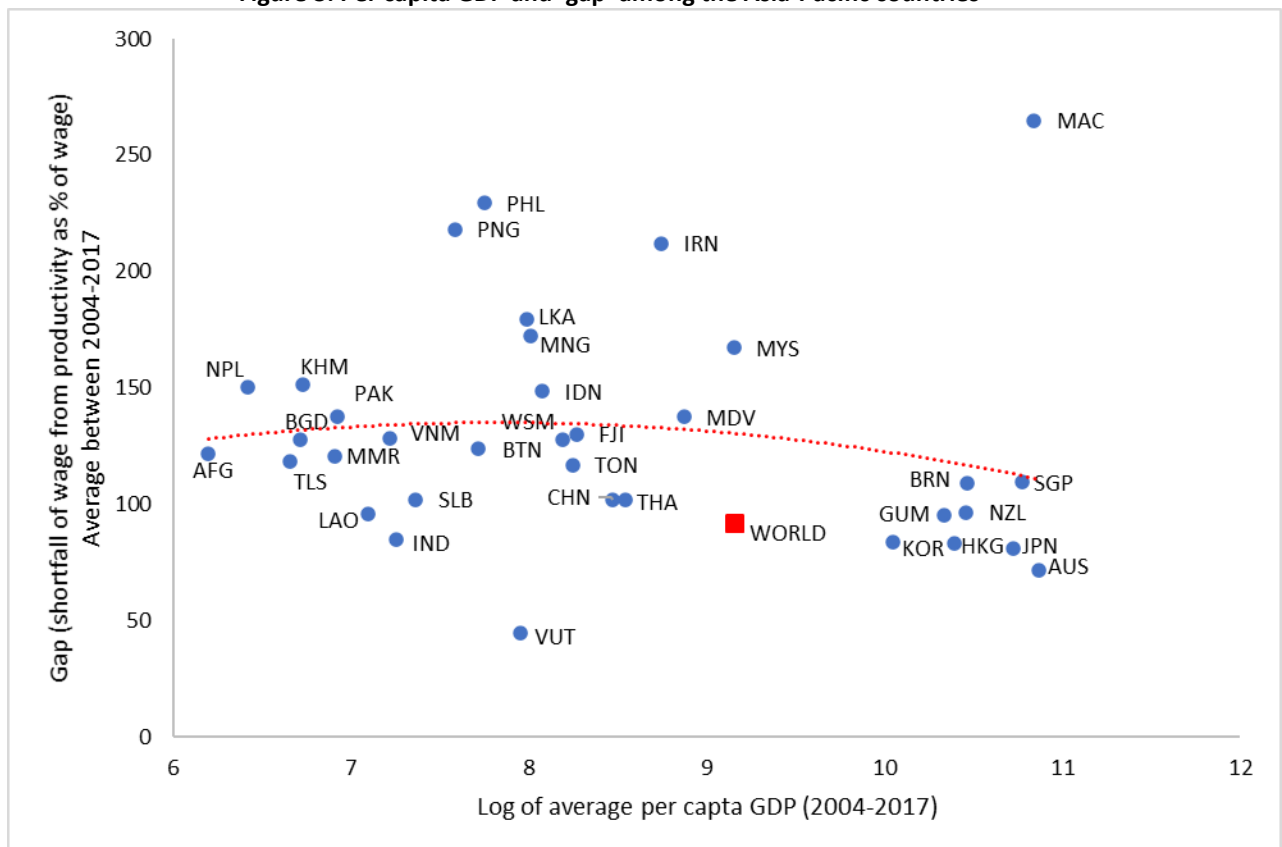
In Southern Asia, though all countries, except Pakistan, made some improvement in closing the gaps with the world averages, in 2017, all countries' labor productivities and wages

remained below the world averages. While Iran and Maldives’s labor productivity were very close to the world average, their wages were still considerably below the world average in 2017. Afghanistan had the lowest labor productivity wage. In Eastern Asia, Hong Kong (China), Japan, Republic of Korea, and Macao (China) had higher levels of labor productivities and wages while China and Mongolia maintained lower levels of labor productivity and wage than the respective world averages. China achieved a substantial improvement in closing the gaps with the world averages both in terms of labor productivity and wage.

Table 7 suggests that in South-Eastern Asia, only Brunei Darussalam, Malaysia and Singapore had higher levels of labor productivity than the world average and only Brunei Darussalam and Singapore had higher levels of wage than the world average. All countries registered closing the gaps with the world averages in 2017. Keeping Brunei Darussalam, Malaysia, and Singapore apart, in the case of labor productivity, in 2017, the gap was the highest for Timor-Leste and the lowest for Thailand. In the case of wage, keeping Brunei Darussalam and Singapore apart, the gap was the highest for Cambodia and the lowest for Malaysia.

Both Australia and New Zealand maintained higher levels of labor productivity and wage than the world averages. However, the positive gaps, in terms of labor productivity and wage, declined for both these countries between 2004 and 2017. Except Guam all other Pacific countries had lower levels of labor productivity and wage than the world average. Between 2004 and 2017, while for Fiji, Papua New Guinea, Solomon Island and Tonga the gaps, both in terms of productivity and wage, declined, the gaps increased for Vanuatu and Samoa.

Figure 3: Per capita GDP and ‘gap’ among the Asia-Pacific countries



Source: Author’s calculations

Figure 3 presents a scatter plot, over the period 2004-2007, of individual countries' average gap in percent on the vertical axis versus average per capita GDP on the horizontal axis. Macao (China) appears as an outlier. It also, appears that the gap increases with per capita GDP as we move from low-income or lower-middle income country to upper-middle income country. However, the gap declines as we move towards the high-income countries. There is a wide variation among the upper-middle income countries. For example, while China and Thailand are close to the trendline, Philippines and Papua New Guinea are far from the trend line. Among the lower-middle income countries, India has the lowest gap. This can be attributed to India's strong labor union and strong labor regulations.

4.2. Factors affecting the gap between labor productivity and wage

We considered the following cross-country econometric model, indicated in equation 2, to explore the factors affecting the gap between labor productivity and wage in the Asia-Pacific countries.

$$gap_{it} = f \{trd_sr_{it}, \log(pc_fdi)_{it}, edu_{it}, \log(pc_gdp)_{it}, \log[(pc_gdp)^2]_{it}, nagemp_sr_{it}, \log(tech)_{it}, lab_mkt_{it}, r_dummies\} \quad (2)$$

Where, *gap* = an index of the gap between labor productivity and wages

According to Strain (2019) international trade and technological advances may have important implications for the wage-productivity gap. Hartmann et al. (2017) argued that a rising gap between labor productivity and wage can lead to higher inequality. Also, as in equation 2, real GDP per capita is considered as a proxy for structural determinants correlated with levels of income and its squared value is added to the regressors. FDI is associated with higher productivity and an increased demand for skilled labor can lead to the rise in the gap if wage does not rise in correspondence (Peluffo, 2013). As higher education can lead to increased level of awareness among the workers, education can help reduce the gap between labor productivity and wage. Since the average labor productivity and wages are much higher in the manufacturing and tertiary sectors than those in the agricultural sector, the dominance of the non-agricultural sector in total employment may suggest higher gap between labor productivity and wage. The presence of labor organizations (i.e., trade unions) can have a positive impact on reducing the gap.

Table 8 presents the regression results of FE and RE models. Both these models consider trade, FDI, education, per capita GDP and its squared value, and non-agricultural employment as the explanatory variables. Each of these regressions uses the same balanced panel dataset for 33 Asia-Pacific countries with the 14 years span as we employed in the estimation of equation 1. The results of FE and RE models are similar. However, Hausman test suggests the supremacy of FE model over the RE model. Results from the FE regression model show that the explanatory variables, related to trade, FDI, education, per capita GDP and its squared value, and non-agricultural employment, are statistically significant. One percentage point rise in the trade-GDP ratio is associated with 0.168 percentage points rise in the gap. Also, a doubling of the per capita FDI is associated with 1.27 percentage points rise in the gap. In the case of education, an increase in the average years of schooling by one year is associated with

4.338 percentage points fall in the gap. Moreover, a doubling of the per capita GDP is associated with 69.4 percentage points rise in the gap. The squared value of per capita GDP has a negative coefficient indicating a decreasing return at the higher level of per capita GDP. Finally, one percentage point rise in the non-agricultural employment share is associated with 1.118 percentage points rise in the gap.

Table 8: Cross-country panel regression of the gap between labor productivity and wage in Asia-Pacific

Variables	Fixed Effect model	Random Effect model
	gap	gap
trd_sr	0.168*** (0.035)	0.133*** (0.031)
lpc_fdi	1.270* (0.692)	1.103* (0.592)
Edu	-4.338** (1.365)	-2.321*** (1.276)
lpc_gdp	69.368** (28.283)	93.920** (23.351)
(lpc_gdp) ²	-4.784*** (1.743)	-6.579*** (1.352)
nagemp_sr	1.118*** (0.276)	1.067*** (0.254)
Constant	-173.395* (107.563)	-250.405** (93.452)
Year dummies	Yes	Yes
Fixed effect	Yes	No
No. obs.	462	462
No countries	33	33
R-squared	0.1665	0.1618
Prob > F	0.000	0.000

Source: Author's calculations

Note: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 9 presents the regression results involving the technology and labor market institution variables in the cross-country panel regression. Here, too, based on the Hausman test, we have reported only the FE model results. Under this modified specification, it appears that, the technology variable has a positive and significant association with the gap, and a unit increase in the technology index is associated with 10.239 percentage points rise in the gap. Also, the labor market institution variable has a negative and significant association with the gap, and a unit increase in the index is associated with 2.068 percentage points fall in the gap.

Table 9: Technology and labor market institution in the cross-country panel regression of "gap"

Variables	Fixed Effect model
	gap
trd_sr	0.139*** (0.045)
lpc_fdi	2.160** (0.962)
Edu	-4.548* (2.425)
lpc_gdp	120.712** (44.940)
(lpc_gdp) ²	-7.636*** (2.670)

Variables	Fixed Effect model
	gap
nagemp_sr	0.618* (0.354)
tech	10.239** (4.824)
lab_ins	-2.068* (0.918)
Constant	-173.395* (107.563)
Year dummies	Yes
Fixed effect	Yes
No. obs.	275
No countries	25
R-squared	0.1629
Prob > F	0.000

Source: Author's calculations

Note: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

In Table 10, sub-regional dummies are added to the RE model of the original regression equation (reported in Table 8). ANZ is considered as the base. The regression results indicate that all original variables maintained their signs and significance compared to the RE estimates reported in Table 8, though the sizes of the coefficients change with some degrees. The coefficients of the dummy variables for four sub-regions are insignificant suggesting that, relative to ANZ, all the four other sub-regions maintain the overall association found in the original regression.

Table 10: Sub-regional dummies in the cross-country panel regression of "gap"

Variables	Random Effect model
	gap
trd_sr	0.136*** (0.032)
lpc_fdi	1.105* (0.595)
edu	-3.114** (1.288)
lpc_gdp	95.323** (23.351)
(lpc_gdp) ²	-6.593*** (1.452)
nagemp_sr	1.021*** (0.258)
d_SAsia	6.728 (30.369)
d_SEAsia	-0.972 (29.014)
d_EAsia	-18.994 (29.897)
d_Pacific	-13.091 (31.475)
Constant	-255.935*** (95.566)
Year dummies	Yes

Variables	Random Effect model
	gap
Fixed effect	No
No. obs.	462
No countries	33
R-squared	0.1621
Prob > F	0.000

Source: Author's calculations

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.3. Summary and analysis of the findings

The regression results reported in Section 4.2 suggest that trade openness and FDI have positive association with the gap between labor productivity and wage in the Asia-Pacific countries. As countries liberalized their trade regimes and attracted FDI, to remain competitive in the global export market, there have been some pressure depressing wage growth. However, together with trade liberalization and FDI, technological development led to productivity growth at faster rate than the wage growth (Dao et al. 2017; Das, 2019), which contributed to the rise in the gap. ESCAP (2018) argued that capital accumulation, technological growth, and trade openness all these factors contributed to an increase in inequality, on average, in Asia and the Pacific.

The regression results also suggest that education has a negative association with the gap. As education increases workers' expectation about the wage (Becker and Chiswick, 1966; Psacharopoulos, 1993; Ashenfelter and Krueger, 1994; Card, 2001; Psacharopoulos and Patrinos, 2018), there is a positive pressure on wage growth with the increased level of education.

Both the per capita GDP and non-agricultural employment have positive association with the rise in gap in the Asia-Pacific countries. This suggests that the structural transformation and economic growth process in the Asia-Pacific region remained far from being inclusive. While Asia-Pacific's growth record in recent time has been remarkable, there is a growing concern that the benefits are not equitably shared as poverty remained high despite the recent decline and inequality was increasing. As pointed out by Triggs and Urata (2020), much of Asia's growth has not been shared, it has not been 'inclusive growth'. High degree of informality in the labor market in many Asia-Pacific countries also keep the wage growth suppressed. According to ILO (2018), more than 68 percent of the employed population in Asia-Pacific are in the informal economy and most of them lack social protection, rights at work and decent working conditions. Southern Asia and South-Eastern Asia and the Pacific have higher shares of informal employment than Eastern Asia. In 2016, shares were 50.7 percent in Eastern Asia, 75.2 percent in Southern Asia and the Pacific and 87.8 percent in Southern Asia.

Presence of stronger labor market institution has a negative association with the gap. As argued by ILO (2016), collective bargaining provides a mechanism for both employers and their organizations and trade unions to establish fair wages and working conditions, and to build sound labor relations. Governments, in the Asia-Pacific, need to create enabling environments for effective collective bargaining, based on the principles set out in the Right to Organise and Collective Bargaining Convention, 1949 (No. 98) and the Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87). Trade unions

and employers' organizations need to improve their technical and representative capacity to play effective roles in collective negotiations.

5. Trends in Inequality in the Asia-Pacific Countries

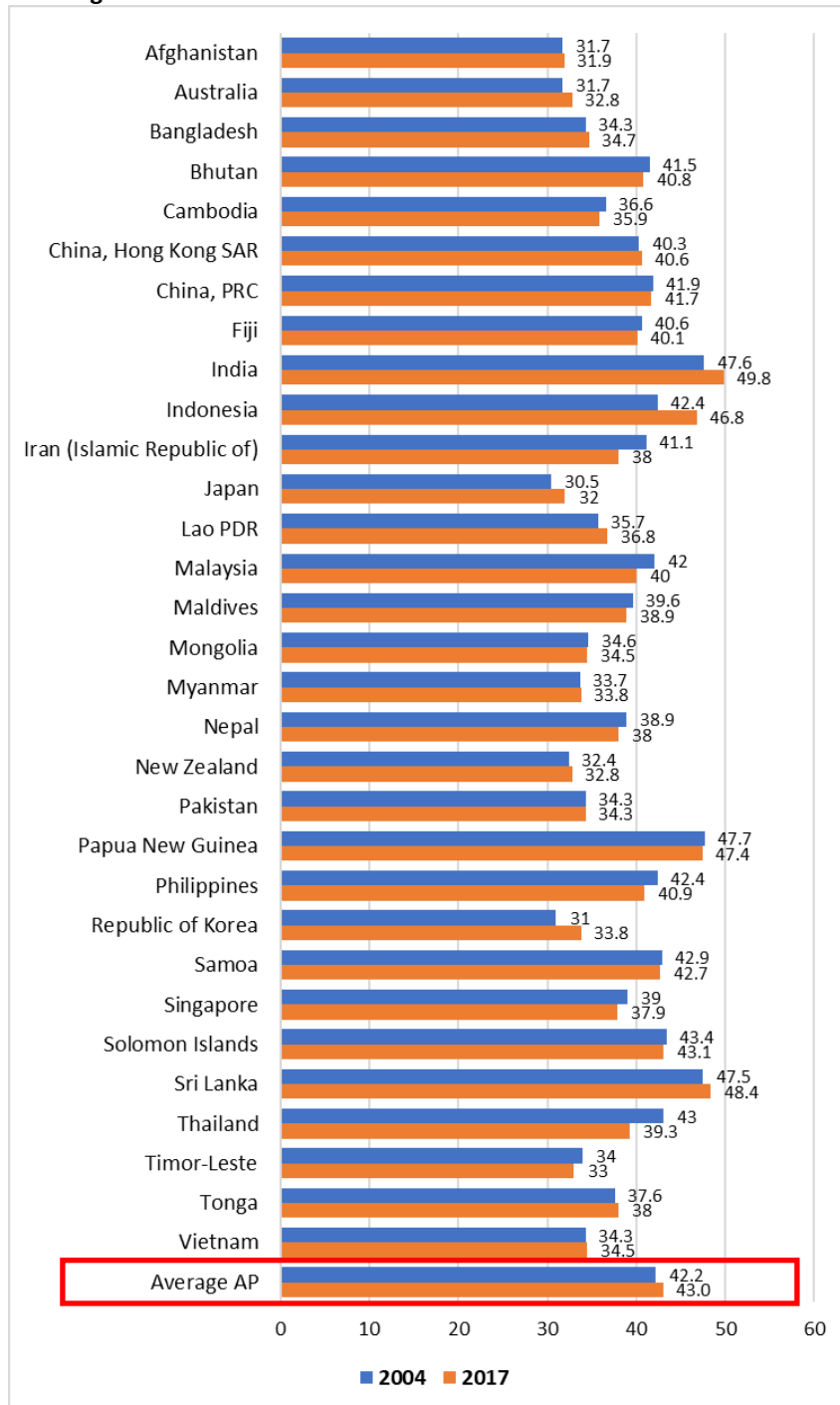
5.1. Trends of inequality in the Asia-Pacific Countries during 2004 - 2017

Economic policies in most of the Asia-Pacific countries highlight the importance of accelerated economic growth along with the reduction in poverty and improvement in the inequality scenario. However, despite economic growth, many countries of this region witnessed a rise in the inequality measured by the Gini index—most notably in India, Indonesia, and Sri Lanka, and at much lower levels, in Japan and the Republic of Korea. Importantly, the Gini coefficient also rose by 0.8 percentage points to 43 percent during 2004-2017 for the entire region (Figure 4).

It should be mentioned that the data on Gini index is problematic as there is no consistent time series data of Gini (even the income-based version, let alone wealth, consumption, and other Gini Coefficients) for most of the Asia-Pacific countries. However, Standardized World Income Inequality Database, Version 9.1⁸ tries to compile a consistent time series data on Gini index, which has been used to construct Figure 4. Also, in most of the Asia-Pacific countries inequality data is derived from the household surveys and the concern is that the actual inequality picture is thought to be worse than the survey estimate, as these household surveys mostly fail to capture information from ultra-rich households. Similarly, they also tend to miss many at the lowest end of the income distribution—they often have no fixed address or migrate, at times illegally, work informally if at all, do not respond to phone or internet inquiries—all reducing their participation in any survey.

⁸ <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/LM4OWF>

Figure 4: Gini index of the Asia-Pacific countries in 2004 and 2017



Data Source: The Standardized World Income Inequality Database, Version 9.1

5.2. The relation between labor share in GDP and inequality in the Asia-Pacific Countries and associated determining factors

ESCAP (2018) highlighted that inequality in Asia and the Pacific was on the rise. Many countries, including those held up as models of dynamism and prosperity, experienced a widening of existing gaps, accompanied by environmental degradation. The report found that unequal access to basic opportunities left large groups of people behind and contributed to

widening inequalities of outcomes, particularly in income and wealth. In turn, these inequalities aggravated inequalities in access to health care, education, technology, and protection from natural disasters and environmental hazards – creating hardship for communities and families over generations. ADB (2014) argued that though technological change, globalization, and market-oriented reform had been the key drivers of Asia’s remarkable growth and poverty reduction, they also had significant distribution consequences. According to ADB (2019), despite recent economic growth, income inequality is one of the most profound social, economic, and political challenges in Asia-Pacific countries.

This exercise explains the relationship between functional income distribution and personal income distribution. Given that we are interested in seeing the association between labor share and Gini, we avoided adding explanatory variables which we considered in the estimation equation for labor share. The only exception is per capita GDP, which we included to control for the differences in the level of economic development.

The association between inequality and labor’s share in GDP is measured through the estimation of the following simple cross-country panel econometric model. Here, we didn’t incorporate the variables which we considered in the regression model for labor share and gap as reported in equations 1 and 2, respectively.

$$g_{it} = f \{lab_sr_{it}, hc_{it}, tax-gdp_{it}, \log(pc_remit)_{it}, \log(pc_capstk)_{it}, m_exp_{it}, \log(pop)_{it}\} \quad (3)$$

Where,

g = Gini index of income inequality (from The Standardized World Income Inequality Database, Version 9.1)

hc = an index of human capital based on years of schooling and returns to education, from the Penn World Table 10.1

$tax-gdp$ = the ratio of tax to GDP, from the World Bank, WDI

pc_remit = per capita remittance inflow (US\$), calculated from the World Bank, WDI

pc_capstk = per capita capital stock (US\$), from the Penn World Table 10.1

m_exp = the ratio of military expenditure to GDP, from the World Bank, WDI

pop = Population, from the World Bank, WDI

Table 11 presents the regression results of FE and RE models. Both these models consider labor share, human capital index, tax to GDP ratio, per capita inflow of remittances, per capita capital stock, the ratio of military expenditure to GDP and the size of population as the explanatory variables. Each of these regressions uses an unbalanced panel dataset for 19 Asia-Pacific countries for the period 2004-2017. The results of FE and RE models are similar, and the Hausman test suggests the supremacy of FE model over the RE model. Results from the FE regression model show that all the explanatory variables, except population, are statistically significant with expected signs. One percentage point rise in the labor share is associated with 0.076 percentage points fall in the Gini coefficient. A unit rise in the human capital index is associated with 5.291 percentage points fall in the Gini. Also, a percentage point rise in the tax-GDP ratio is associated with 0.053 percentage points fall in the Gini. A doubling of the per capita remittance inflow is associated with 0.637 percentage points fall in the Gini. In the case of per capita capital stock (a proxy for capital abundance), a doubling of the per capita capital stock is associated with 2.124 percentage points rise in the Gini.

Moreover, a percentage point rise in the ratio of military expenditure to GDP is associated with 0.4 percentage points rise in the Gini. In a separate regression we checked the sub-regional dummies and none of them appeared to be statistically significant—which conveys a meaning: the relationships in the general regression apply to all sub-regions.

Table 11: Cross-country panel regression of the gini in the Asia-Pacific countries

Variables	Fixed Effect model	Random Effect model
	gini	gini
lab_sr	-0.076*** (0.020)	-0.079*** (0.019)
hc	-5.291*** (0.171)	-5.105*** (0.582)
tax-gdp	-0.053** (0.023)	-0.058** (0.022)
lpc_remit	-0.637*** (0.162)	-0.584*** (0.157)
lpc_capstk	2.134*** (0.333)	2.104*** (0.306)
m_exp	0.400** (0.175)	0.372** (0.172)
lpop	0.364 (1.152)	0.107 (0.588)
Constant	45.331** (20.530)	50.259** (10.601)
Year dummies	Yes	Yes
Fixed effect	Yes	No
No. obs.	248	248
No countries	19	19
R-squared	0.3781	0.3776
Prob > F	0.000	0.000

Source: Author's calculations.

Note: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

5.3. Summary and analysis of the findings

The regression results reported in Section 5.2 suggest that the labor share in GDP has a negative association with the Gini, i.e., a lower labor share is associated with a higher Gini coefficient. Similar findings were also reported in studies by Karabarbounis et al (2014), ILO (2015), Erauskin (2020). As labor (capital) share is more evenly (unevenly) distributed, declining (increasing) labor (capital) share is likely to be associated with higher income inequality (Erauskin, 2020).

Our regression results also indicate that the rise in human capital, through increasing years of schooling and returns to education, can reduce inequality. Similar finding was reported by Lee and Lee (2018) when they investigated empirically how human capital, measured by educational attainment, was related to income distribution. Their regressions, using a panel data set covering a broad range of countries between 1980 and 2015, showed that a more equal distribution of education contributed significantly to reducing income inequality. ESCAP (2018) argued for strong support for policies that enhance human capital development to reduce income inequality in Asia-Pacific countries.

Our regression results also show that a higher tax-to-GDP ratio can be associated with a lower Gini. Park (2012) argued that inequality in Asia could be addressed through a combination of taxation, social transfers and social expenditure. Zhuang (2018) was in favor of fiscal policies in Asia-Pacific that would reduce inequality in human capital, arguing that this would also make the tax system more effective and fairer.

Remittances have a positive effect in reducing inequality in Asia and Pacific. Similar findings were also reported in Adams (2006), Adams and Page (2005), Acosta et al (2007), Brown and Jimenez (2007), Ruiz and Vargas-Silva (2009), Sawada and Estudillo (2006), and ADB (2012). However, according to ESCAP (2018), the potential benefit of remittances can be undermined due to high remittance costs and high costs of recruitment of migrants, which can see migrants and their families falling into debt. As reported by the ESCAP (2018) report, during the first quarter of 2017, the average transaction costs for sending remittances to Vanuatu were as high as 17.3 percent, 14.2 percent to Cambodia and 12.4 percent to the Lao People's Democratic Republic.

Higher availability of per capita stock of capital, proxied as technological development, is associated with the rise in inequality. ESCAP (2018) showed that the relationship between technology and inequality could be multifaceted. While technology enhanced productivity, accelerated economic growth, enabled knowledge and information sharing and increased access to basic services, it also increased inequalities in the Asia-Pacific countries. ADB (2014) study also held the similar view.

Our regression results also show that a higher share of military expenditure in GDP would be associated with worsened inequality. Studies by Abell (1994), Ali and Galbraith (2003), Elveren (2012), and Hirnissa et al (2009) also support this finding.

One caveat we should mention here that to look into whether functional income distribution can explain the personal income distribution or growing inequality, it would have been preferable to have the Gini index to be decomposed by going through income sources of people with a deep dive in the micro data. This relates to the case of 'homoploutia' when even many laborers, these days, are also owners of significant amount of capital, and, therefore, are earning incomes not only from labor but also from capital. If this is so, then it is not only the functional income distribution but also distribution of income within labor that determines the inequality.

6. COVID-19: Contexts and Priorities for the Labor Market

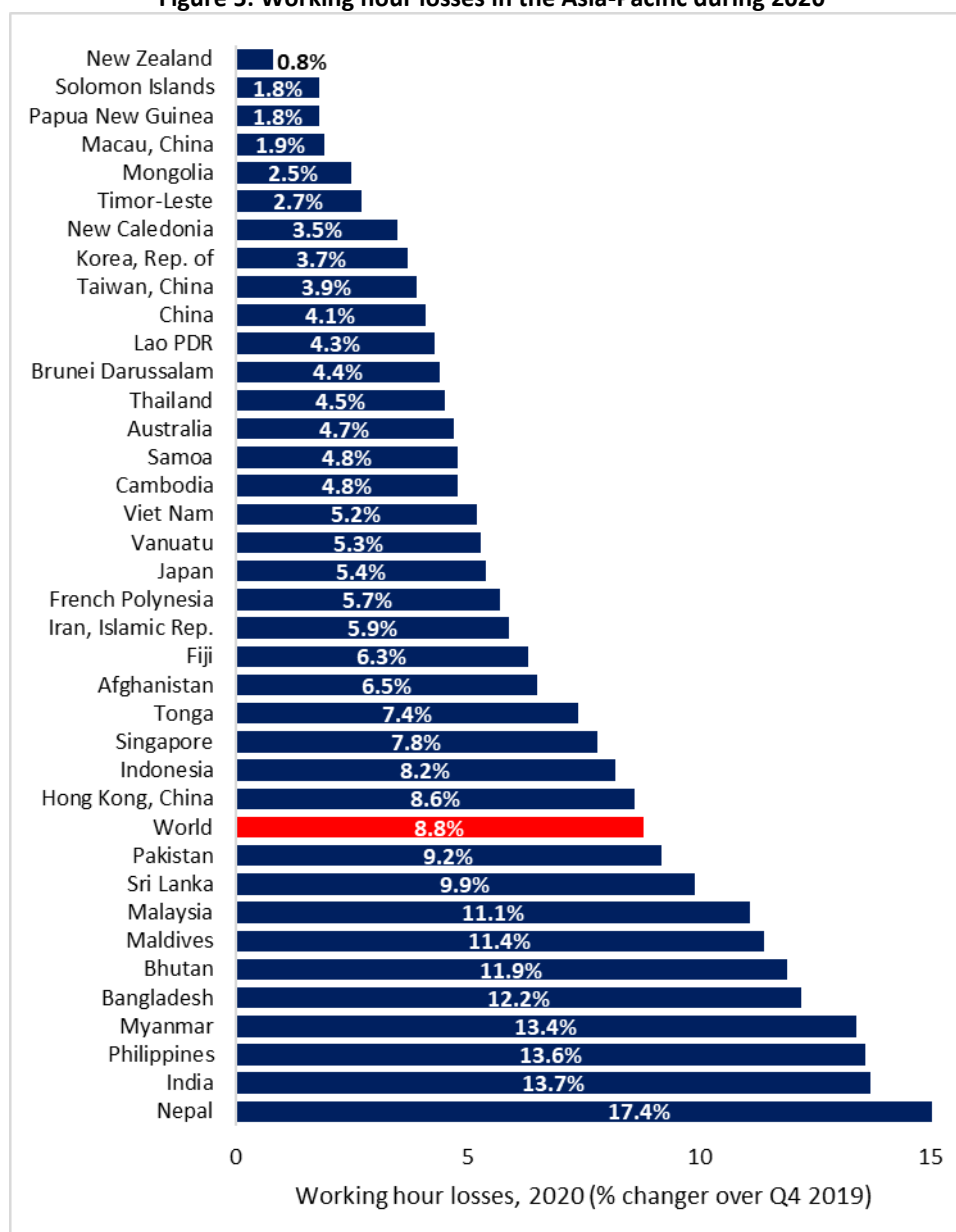
COVID-19 is going to have some important implications for the labor market. According to the estimates made by the ILO (2021), in 2020, working-hour losses were the most widespread effect of COVID-19 on labor markets, affecting millions of workers in the Asia-Pacific region. While the share of working hours lost was below the global average of 8.8 per cent in most economies in the region, losses were more extreme in ten countries – seven of which are in South Asia (Figure 5).

Petropoulos (2021) argued that while an unprecedented digitalization of the global economy had been underway where artificial intelligence had become a reality, the ongoing

technological transformation of work would likely interact with the COVID-19 pandemic shock resulting in fewer jobs for the less-educated and low-skilled workers as well as a further decline in the labor share of national income.

Around a year and a half have passed since the onset of the COVID crisis. The global economy as well as the economies of most of the Asia-Pacific countries have certainly not been able to go back to the pre-COVID state. Though there have been some signs of recovery, the recovery process has remained weak, fragile and uncertain. The effective recovery process also requires a better understanding of the COVID contexts and setting the priorities right. That, in turn, will need to involve careful consideration of aspects of the “old normal” that are no longer the right goals to aim for, e.g., owing to their lack of sustainability.

Figure 5: Working hour losses in the Asia-Pacific during 2020



Source: ILO modelled estimates. https://www.ilo.org/asia/publications/WCMS_779273/lang--en/index.htm

The crisis we have seen in COVID for over a year is not just an economic crisis. There is also a big social crisis. Countries in the Asia-Pacific made great strides in the last few decades, especially in reducing poverty. But during COVID, there has been a marked jump in the poverty rate. Economic decline induced by the COVID disruptions increased the number of poor and unemployed people quite considerably. Many, losing jobs, have returned to villages from cities, which led to some socio-economic impacts and put the rural labor market under additional pressure. A large part of the economy in most of the Asia-Pacific countries involve the informal labor market. The informal sector has been most affected during the COVID period. Many, who had various small businesses, either have closed their businesses or are running them at a partial level.

Many migrant workers have returned to the country, and the prospects of their returning to the destination countries appear to be bleak. New employment opportunities abroad are not encouraging as the destination countries are also struggling for their economic recoveries. At the same time, the domestic labor market sees the addition of a new increment in the labor force every year. One critical concern is that the pattern of economic growth in the last decade has not been at par with the objective of large-scale job creation in many Asia-Pacific countries. The problem has become more acute during COVID. There is also a big problem of the high degree of unemployment among educated youth.

The uncertainty and instability in the global market will continue to affect the export sector and remittances. Nevertheless, just as the recovery of the export sector is crucial for the recovery of the overall economy, the recovery of the domestic economic sectors and their micro, small and medium enterprises is critical, too as far as recovery of employment in the informal sector is concerned. Micro, small, and medium enterprises play a critical role in the supply chains of different sectors of the economy, and these are severely affected by the COVID epidemic. Therefore, the recovery of these enterprises is crucial for ensuring a strong upswing of the overall economy.

The governments of the Asia-Pacific countries announced several stimulus packages soon after the onset of the COVID crisis. It is necessary to understand whether these stimulus packages have attained their intended objectives. Some evidence shows that the distribution, management and monitoring of the stimulus packages remained inadequate and weak (Huang and Saxena, 2021). There is a high degree of heterogeneity among firms and sectors in terms of access to the stimulus packages. Many firms and sectors have been facing several challenges in getting stimulus packages as processes to launch them remained long and entailed many bureaucratic complications. There is a common understanding that large firms have benefited most from stimulus packages. However, micro, small and medium entrepreneurs have not been able to take advantage. Lack of initiatives, transparency, accountability, and efficiency can undermine the objectives behind the stimulus packages. A key aspect in this regard is the contribution of these packages to sustainable development, in particular, their “greenness”, an aspect in which most have performed poorly so far.

There is no denying that the labor market and employment challenges in Asia-Pacific countries are closely linked to the acceleration and sustaining of economic growth, enhancing the quality of economic growth and economic diversification. COVID-19 has also led to high adjustment costs both at the household and firm levels. In pre-pandemic times, with the

mobility of labor, job losses in one sector were compensated by job gains in other sectors: for example, either through the movements from agriculture to industry and services or through movements within sub-sectors of agriculture, industry, and services. But, during the pandemic, options for such adjustments and relocation of labor are limited and uncertain.

There are grave future implications of the current labor market challenges. The recovery in the labor market is dependent on the recovery of the overall economy. However, the economic recovery process has remained slow and disrupted. The economic recovery is also happening at the cost of a distinct inter-generational trade-off with high adjustment costs. The pandemic forced many people, with uncertain prospects of jobs and earnings, to place emphasis on their current survival rather than on their human capital development for the future. Moreover, with schools and educational facilities having remained closed for months, there is a high risk that students from distressed families will be out of the education system permanently. Also, while the micro, small and medium enterprises (MSMEs) are the prime victims of the pandemic, their recoveries have remained highly uncertain. Many self-employed in the MSMEs perhaps permanently lost their capital and parts of their upstream or downstream supply chain linkages. In addition, wage employment is suffering as economic activities are yet to recover. All these may increase the existing high levels of youth unemployment and youth NEET. Finally, unfolding shreds of evidence reveal that females are more likely to be affected than their male counterparts.

A few priority areas thus need attention to deal with the situation.

First, the availability of effective vaccines and the vaccination of the majority of people is critical for sustained recovery. At the same time, the enforcement of the rules and regulations related to infection control practices is vital.

Second, the governments' stimulus packages to revive the economy should be implemented more effectively and expanded if necessary. An assessment is needed to understand the challenges and constraints in implementing the stimulus packages to re-design and re-target these packages more in line with sustainable development.

Third, it is necessary to take policies and strategies targeting the labor market. The governments should introduce relevant social protection programs in line with the ongoing labor market challenges, especially in urban areas.

7. Policy Implications and Conclusion

As our analyses show that the current level of the labor share in many Asia-Pacific countries are much lower than the world average and there is a declining trend in the labor share in these countries. With the current pattern of economic growth, trade openness, technological progress and educational development, there is a high risk that in many Asia-Pacific countries the labor share will stay low or even decline further. Our analysis also shows that the reduction in labor share in income is associated with rising inequality in the Asia-Pacific countries.

The widening income inequality in many Asia-Pacific countries underscores the need to understand the causes of growing inequality and to undertake appropriate policies to narrow the income gap. Two major instruments of the government's policies are very relevant for addressing challenges related to widening income inequality. These interrelated instruments are revenue generation (especially tax and non-tax revenue), and public expenditure on social sectors (especially education, health, and social protection).

In many Asia-Pacific countries, tax revenue in proportion to GDP declined and remained well below required level. The very high share of informal workers has contributed to a low tax base and hence low tax revenue ratio. With low tax-GDP ratio, government has very limited ability to spend adequately on the social sectors. Furthermore, over the years, the government's efforts to increase revenue from direct taxes (taxes on income and profit) haven't seen much success in many Asia-Pacific countries. As far as direct taxes are concerned, a large number of potential taxpayers, which include many ultra-rich people, remain outside of the tax net or pay very little tax. Also, a number of economic sectors, capable of paying taxes, are either fully exempted from paying taxes or enjoy the privileges of paying a substantially reduced amount of taxes.

It is also important to highlight here that, as far as equitable tax policy is concerned, individuals in similar financial circumstances with similar fundamental ability to pay taxes should be taxed at the same rate (horizontal equity), and the individuals in different circumstances with different abilities to pay should not be taxed at the same rate (vertical equity). Given the culture of tax avoidance in many Asia-Pacific countries (Araki and Nakabayashi, 2018; ADB, 2020), the objective of achieving horizontal equity is compromised. Also, due to the heavy reliance on indirect taxes, the objective of achieving vertical equity is seriously undermined. This has resulted in a tax system which is regressive and inequality enhancing. Richer people become the largest beneficiaries of such weak tax system.

Now, if we look at the expenditure side of fiscal policy, especially public expenditure related to education, health, and social protection, in many Asia-Pacific countries there has been little improvement in the allocation, in proportion to GDP, over the past decades. Even though public expenditure on social sectors should be used to counter widening income inequality, this instrument has not been used judiciously in many countries in the recent decade. Low public education and health expenditure does not help improve the productivity of workers and is not consistent with the effort to reduce poverty and inequality. One obvious implication of the low public expenditure on education and health is the high degree of out-of-pocket private education and health expenditure which is one of the major contributing factors to growing inequality. Also, many governments' social protection programs are inadequate in addressing pockets of poverty and regional disparity in poverty.

One major challenge faced by policymakers is that though conventional measurements of poverty are useful in identifying the poor people in general, these measurements fail to capture the critical sections of the population: the extreme poor and those who are vulnerable. They are left out for various reasons including gender, age, geographical location, disability, and many other social factors. While the reduction in poverty is an important policy agenda, many poor and extreme poor people as well as vulnerable communities can be left out through the conventional scanners of different poverty reduction programs. Therefore,

social protection is primarily intended to complement the poverty reduction programs through which this left-out population can be brought under the coverage of social protection. It is imperative that the social protection system is designed effectively, considering a comprehensive understanding of the poverty and vulnerability situation of a country, while at the same time it is dynamic and forward-looking.

Though country experiences vary, social protection in general covers policies and programs designed to reduce poverty and vulnerability through labor market interventions for the efficient functioning of labor markets, interventions related to social insurance to reduce people's exposure to risks, and social assistance interventions to enhance people's capacity to manage economic and social vulnerabilities, such as unemployment, exclusion, sickness, disability, and old age. Strengthening the social protection system also aims to promote women's empowerment and gender equality. The 2030 Agenda for Sustainable Development sets a clear vision for action to expand coverage of social protection systems and measures for all, with a view to eradicating poverty and reducing inequality, including gender inequality.

It should also be highlighted that governments in many developing countries suffer from the usual problem of not getting their priorities right. Therefore, while governments allocate resources for many "low-priority" activities such as military activities (from the viewpoint of development perspective), the resources left for social protection remain grossly inadequate.

Education is critically important for economic growth and overall development of society. Education directly enhances human capital and contributes to economic growth. Even though Asia-Pacific countries made considerable progress in gross-enrolment in primary education for both genders, many countries are lagging in ensuring quality education for all. Many countries spend an inadequate share of GDP on education. Also, the education sector suffers from disparities between regions and between rich and poor. There is a high degree of inequality with respect to access to quality education as poorer people and people in remote rural areas have limited access to higher education and quality educational institutions. Therefore, reforms in the education sector are much warranted, which should include improvements in the quality of institutional mechanisms in the education sector, modernization of the curriculum, substantial increase in the supply of trained teachers, harmonization among different educational systems, reduction in disparities and unequal access to education by improving and expanding educational infrastructure across regions, and putting due emphasis on secondary and tertiary education, vocational training, and skill development. For this, there is a need for a substantial increase of the ratio of public spending on education to GDP.

References

Abell, J. D. (1994). "Military Spending and Income Inequality". *Journal of Peace Research* Vol. 31, No. 1 (Feb., 1994), pp. 35-43 (9 pages)

Acemoglu, D. (2002). Technical Change, Inequality, and the Labor Market. *Journal of Economic Literature*, XL, 7-72.

Acosta, P., A. Lartey, K. K., Emmanuel and F. Mandelman. (2007). Remittances and the Dutch Disease. FRB of Atlanta Working Paper No. 2007-8. Federal Reserve Board of Atlanta. Available: www.frbatlanta.org/filelegacydocs/wp0708.pdf

Adams, R., Jr. (2006). Remittances, Poverty and Investment in Guatemala. In C. Oxden and M. Schiff, eds. *International Migration, Remittances and the Brain Drain*. Washington DC: World Bank.

Adams, R., Jr. and J. Page. (2005). Do International Migration and Remittances Reduce Poverty in Developing Countries? *World Development*. 33 (10). pp. 1645–1669.

ADB. (2005). *Labor Markets in Asia: Promoting Full, Productive, and Decent Employment*. Asian Development Bank. Manila, Philippines.

ADB (2012). *Global Crisis, Remittances, and Poverty in Asia*. Asian Development Bank. Mandaluyong City, Philippines. <https://www.adb.org/sites/default/files/publication/29831/global-crisis-asia.pdf>

ADB (2014), "Inequality in Asia and the Pacific". Asian Development Bank, Manila. <https://www.adb.org/publications/inequality-asia-and-pacific>

ADB (2019). "Demystifying Rising Inequality in Asia". Asian Development Bank, Manila. <https://www.adb.org/publications/demystifying-rising-inequality-asia>

ADB (2020). *A Comparative Analysis of Tax Administration in Asia And The Pacific*. Asian Development Bank, Manila. <https://www.adb.org/sites/default/files/publication/569626/tax-administration-asia-pacific-2020.pdf>

Ahn, P. (2015), "Trends in Collective Bargaining in Asia and the Pacific". Presented at the ITCILO training program. <https://actrav-courses.itcilo.org/en/a3-58345/a3-58345-1-presentations/pongsul-cb-trends-in-ap2015.pdf>

Ali, H. E., & Galbraith, J. (2003). Military expenditures and inequality: Empirical evidence from global data. The University of Texas at Austin UTIP Working Paper No. 24.

Aoyagi, C., and Ganelli, G., (2013), "The Path to Higher Growth: Does Revamping Japan's Dual Labor Market Matter?," IMF Working Paper 13/202, International Monetary Fund, Washington.

Aoyagi, C., and Ganelli, G. and Murayama, K., (2015), "How Inclusive is Abenomics?" IMF Working Paper 15/54, International Monetary Fund, Washington.

Arpaia, A., Pérez, E., & Pichelmann, K. (2009). Understanding Labour Income Share Dynamics in Europe. *European Economy. Economic Papers*, 379.

Ashenfelter, O. and A. Krueger. 1994. "Estimates of the economic return to schooling from a new sample of twins." *American Economic Review* 84(5): 1157-1173.

Atkinson, A. B. (2009). Factor shares: the principal problem of political economy? *Oxford Review of Economic Policy*, 25, 3-16.

Aum, S. and Shin, Y. (2020). "Why is the Labor Share Declining?" Available at SSRN: <https://ssrn.com/abstract=3736264> or <http://dx.doi.org/10.20955/r.102.413-28>

Balassa, B. (1990), "Incentive Policies and Export Performance in Sub-Saharan Africa." *World Development* 18(3): 383–91.

Barro, R. J., & Lee, J.-W. (2010). A New Data Set of Educational Attainment in the World, 1950-2010. NBER Working Paper No. 15902.

Barro, R. J., & Sala-i-Martin, X. (2004). *Economic Growth*. Cambridge, MA: MIT Press.

Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics*, 106, 407-443.

Becker, G.S. and B.R. Chiswick. (1966). "Education and the distribution of earnings." *American Economic Review* 56(2): 358–369.

Bentolila, S and Saint-Paul, G. (2003). "Explaining Movements in the Labor Share," *The B.E. Journal of Macroeconomics*, De Gruyter, vol. 3(1), pages 1-33.

Besley, T., and Burgess, R. (2004). Can Labor Regulation Hinder Economic Performance? Evidence from India. *The Quarterly Journal of Economics*, 119, 91-134.

Bhagwati, J. (1978) *Foreign Trade Regimes and Economic Development: Anatomy and Consequences of Exchange Control Regimes*, Cambridge, MA: Ballinger.

Bhagwati, J. (1987) (ed.), *International Trade: Selected Readings*. Second Edition. MIT Press. Cambridge

Bond, S., and Harding, R. (2011). "\$740bn pay gap threat to US recovery". In *Financial Times* (Vol. 15 Dec 2011, pp. 1).

Brander, J. A. and B. J. Spencer (1985), "Export Subsidies and International Market Share Rivalry", *Journal of International Economics* 18 (1/2): 83-100

Brown, R. and E. Jimenez. (2007). Estimating the Net Effects of Migration and Remittances on Poverty and Inequality: Comparison of Fiji and Tonga. WIDER Research Paper 2007/23. United Nations University and World Institute for Development Economics Research, Finland. Available: <http://www.wider.unu.edu/stc/repec/pdfs/rp2007/rp2007-23.pdf>

Card, D. 2001. "Estimating the return to schooling: Progress on some persistent econometric problems." *Econometrica* 69(5): 1127–1160.

Choyleva, D. (2018), "Chinese workers' share of GDP reaching US levels". Opinion. NIKKEI Asia. <https://asia.nikkei.com/Opinion/Chinese-workers-share-of-GDP-reaching-US-levels2>

Dao, M., Furceri, D., Hwang, J., Kim, M., and Kim, T., (2014), "Strategies for Reforming Korea's Labor Market to Foster Growth," IMF Working Paper 14/137, International Monetary Fund, Washington.

Dao, M., Das, M., Koczan, Z. and Lian, W. (2017). "Why is Labor Receiving a Smaller Share of Global Income? Theory and Empirical Evidence". IMF Working Paper. Washington, DC.

Das, M. (2019), "Does the Exposure to Routinization Explain the Evolution of the Labor Share of Income? Evidence from Asia". Chapter 2 in G. Fields and S. Paul (eds.), *Labor Income Share in Asia*, ADB Institute Series on Development Economics, https://doi.org/10.1007/978-981-13-7803-4_2

Das, S.P., (2005). Gradual Globalisation and Inequality between and within Countries, *Canadian Journal of Economics*, 38(3):852-69.

Daudey, E., and Garcia-Penalosa, C. (2007). The Personal and the Factor Distributions of Income in a Cross-Section of Countries. *Journal of Development Studies*, 43, 812-829.

Decreuse, B., & Maarek, P. (2015). FDI and the Labor Share in Developing Countries: A Theory and Some Evidence. *Annals of Economics and Statistics*, (119/120), 289-319. doi:10.15609/annaeconstat2009.119-120.289

Diwan, I. (2001). Debt as Sweat: Labor, financial crises, and the globalization of capital. In. Washington DC: The World Bank.

Dollar, D. and A. Kraay (2001), "Trade Growth and Poverty". World Bank Policy Research Department Working Paper No. 2587. Washington DC

Dougherty, S. (2008). Labour Regulation and Employment Dynamics at the State Level in India. OECD Economics Department Working Papers, 624.

Dünhaupt, Petra (2013). Determinants of functional income distribution: Theory and empirical evidence, Global Labour University Working Paper, No. 18, International Labour Organization (ILO), Geneva

EC. (2007). The Labour Income Share in the European Union. Employment in Europe 2007, Directorate-General for Employment Social Affairs and Equal Opportunities, Brussels.

Economist (2021), "Labor markets are working, but also changing", Apr 10th 2021 edition

Ellis, L., & Smith, K. (2007). The global upward trend in the profit share. BIS Working Papers, n. 231.

Elveren, Y. A. (2012). Military spending and income inequality: Evidence on cointegration and causality for Turkey, 1963–2007. *Defence and Peace Economics*, 23, 289–301.

Erauskin, I. (2020), "The labor share and income inequality: some empirical evidence for the period 1990-2015", *Applied Economic Analysis*, Vol. 28 No. 84, pp. 173-195. <https://doi.org/10.1108/AEA-04-2020-0028>

ESCAP (2018), "Inequality in Asia and the Pacific in the era of the 2030 Agenda for Sustainable Development", <https://www.unescap.org/sites/default/d8files/knowledge-products/ThemeStudyOnInequality.pdf>

Gollin, D. (2002). Getting Income Shares Right. *The Journal of Political Economy*, 110, 458-474.

Gonzales, C., Jain-Chandra, S., Kochhar, K., and Newiak, M., (2015), "Fair Play: More Equal Laws Boost Female Labor Force Participation," IMF Staff Discussion Note 15/02, International Monetary Fund, Washington.

Greene, W. H. (2008). *Econometric Analysis*. Upper Saddle River, NJ: Prentice--Hall.

Grossman, G. M., & Rossi-Hansberg, E. (2008). Trading Tasks: A Simple Theory of Offshoring. *The American Economic Review*, 98, 1978–1997.

Guerriero, M. (2019). "Democracy and the Labor Share of Income: A Cross-Country Analysis" Chapter 6 in G. Fields and S. Paul (eds.), *Labor Income Share in Asia*, ADB Institute Series on Development Economics, https://doi.org/10.1007/978-981-13-7803-4_6

Guerriero, M. and Sen, K. (2012), "What Determines the Share of Labour in National Income? A Cross-Country Analysis", IZA DP No. 6643

Guscina, A. (2006). Effects of Globalization on Labor's Share in National Income. In IMF Working Paper (Vol. 06/294): IMF.

Harrison, A., McLaren, J., and McMillan, M. (2011). Recent Perspectives on Trade and Inequality. *Annual Review of Economics*, 3, 261-289.

Harrison, A. (2002). Has Globalization Eroded Labor's Share? Some Cross-Country Evidence. In UC Berkeley and NBER.

Hartmann, D., M. R. Guevara, C. Jara-Figueroa, M. Aristarán, and C. A. Hidalgo. (2017). "Linking Economic Complexity, Institutions, and Income Inequality." *World Development* 93: 75–93. <https://doi.org/10.1186/s40008-020-0187-6>

Hirnissa, M. T., Habibullah, M. Z., & Baharom, A. H. (2009). Defense spending and income inequality: Evidence from selected Asian countries. *Modern Applied Science*, 3(5), 96–111.

Huang, Z. and Lardy, N. R. (2016), "China's Rebalance Reflected in Rising Wage Share of GDP", *China Economic Watch*, Peterson Institute for International Economics. <https://www.piie.com/blogs/china-economic-watch/chinas-rebalance-reflected-rising-wage-share-gdp>

Huang, Z. and Saxena, S. (2021), "Combating COVID-19 in Asia and the Pacific: Measures, Lessons and the Way Forward", UNESCAP, Bangkok. https://www.unescap.org/sites/default/files/Policy%20brief_MPFD_Combating%20COVID-19%20in%20Asia%20and%20the%20Pacific%20updated.pdf

ILO (2015). "Income inequality and labour income share in G20 countries: Trends, Impacts and Causes", ILO, IMF, OECD and World Bank. <https://www.oecd.org/g20/topics/employment-and-social-policy/Income-inequality-labour-income-share.pdf>

ILO (2016). "Wages in Asia and the Pacific and the Arab States". ILO brief. https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_534369.pdf

ILO (2018). *Women and Men in the Informal Economy: A Statistical Picture*. Third Edition. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_626831.pdf

ILO (2019), "The Global Labour Income Share and Distribution: Key Findings", Data Production and Analysis Unit, ILO Department of Statistics, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_712232.pdf

ILO (2021), "COVID-19 and employment protection policies: A quantitative analysis of the Asia-Pacific region". Research Brief. International Labour Organization. https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_810842.pdf

ILO. (2008). *Income Inequalities in the Age of Financial Globalization*. In *World of Work Report 2008*. Geneva: International Institute for Labour Studies.

IMF. (2001). *World Economic Outlook. The Information Technology Revolution*. World Economic and Financial Surveys.

IMF. (2007). *The Globalization of Labor (Chapter 5)*. In *World Economic Outlook: Spillovers and Cycles in the Global Economy* Washington.

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 WP/16/48. <https://www.imf.org/external/pubs/ft/wp/2016/wp1648.pdf>

Jayadev, A. (2007). Capital account openness and the labour share of income. Cambridge Journal of Economics, 31, 423-443.

Karabarbounis, L., Neiman, B. and Adams, J. (2014). "Labor Shares and Income Inequality," Meeting Papers 539, Society for Economic Dynamics.

Kravis, I. B. (1959). Relative Income Shares in Fact and Theory. The American Economic Review, 49, 917-949.

Krueger, A. B. (1999). Measuring Labor's Share. The American Economic Review, 89, 45-51.

Krugman, P. R. (2008). Trade and Wages, Reconsidered. Brookings Papers on Economic Activity, 39, 103-154.

Krugman, P. (1986), (ed.) Strategic Trade Policy and the New International Economics. Cambridge, MA.: The MIT Press.

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

Lall S. (1990), Building Industrial Competitiveness in Developing Countries, Paris: OECD Development Centre.

Lawless, M., & Whelan, K. (2011). Understanding the Dynamics of Labor Shares and Inflation. Journal of Macroeconomics, 33, 121-136.

Lee, J.-W. and Lee, H. (2018). "Human Capital and Income Inequality". ADBI Working Paper 810. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/human-capital-and-income-inequality>

Lewis, W. A. (1955). Theory of Economic Growth.

Liang, W. and Mai, C. (2003). "Capital Flows, Vertical Multinationals, Wage Inequality, and Welfare". Review of Development Economics, 2003, vol. 7, issue 4, 599-608

Luo, C., and Zhang, J. (2010). Declining Labor Share: Is China's Case Different? China & World Economy, 18, 1-18.

Maarek, P. (2010). Labor share, Informal sector and Development. GREQAM Working Paper.

Maiti, D. (2019). "Trade, Labor Share, and Productivity in India's Industries". ADBI Working Paper 926. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/trade-labor-share-and-productivity-india-industries>

Marjit, S., Beladi, H. and Chakrabarti. A. (2004). "Trade and Wage Inequality in Developing Countries", *Economic Inquiry* 42(2):295-303. DOI:10.1093/ei/cbh061

Milanovich, B. (2018). *Global Inequality: A New Approach for the Age of Globalization*. Harvard University Press.

Myint, H. (1958). "The 'Classical Theory' of International Trade and the Underdeveloped Countries," *Economic Journal* 68: 317-337

Ng, A., Tan, T. T., and Tan, Z. G. (2018). "What Explains the Increase in the Labor Income Share in Malaysia?". ADBI Working Paper 894. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/what-explains-increase-labor-income-sharemalaysia>

Nickell, S., and Layard, R. (1999). Labor market institutions and economic performance. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics* (Vol. 3, pp. 3029-3084): Elsevier.

Nurkse, R. (1962), *Patterns of Trade and Development*, Oxford: Basil Blackwell.

O'Mahony, M., Vecchi, M. and Venturini, Francesco (2019). "Technology, Market Regulations, and Labor Share Dynamics". Chapter 4 in G. Fields and S. Paul (eds.), *Labor Income Share in Asia*, ADB Institute Series on Development Economics, https://doi.org/10.1007/978-981-13-7803-4_4

Ortega and Rodriguez, 2006

Pack, H. and L. E. Westphal (1986), "Industrial Strategy and Technological Change", *Journal of Development Economics* 22: 87–128

Park, C. (2012). "Taxes, Social Transfers, and Inequality in Asia". IMF-Japan High-Level Tax Conference "Emerging Tax Issues In Asian Countries" (January 31-February 3, 2012, Tokyo). <https://www.imf.org/external/np/seminars/eng/2012/asiatax/pdf/park.pdf>

Peluffo, A. (2013). "Foreign direct investment, productivity, demand for skilled labor and wage inequality: an analysis for Uruguay," *Documentos de Trabajo* (working papers) 13-02, Instituto de Economía - IECON.

Petropoulos, G. (2021). *Automation, COVID-19, and Labor Markets*. ADBI Working Paper 1229. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/automation-covid-19-and-labor-markets>

Piketty, T. (2014). *Capital in the twenty-first century* (A. Goldhammer, Trans). Cambridge, MA and London: Belknap Press.

Prebisch, R. (1950), "The Economic Development of Latin America and its Principal Problems", *Economic Bulletin for Latin America*, 7(1):1-22, February 1962 (reprinted).

Psacharopoulos, G. and Patrinos, H. A. (2018). "Returns to Investment in Education: A Decennial Review of the Global Literature". World Bank Policy Research Working Paper 8402. <https://openknowledge.worldbank.org/bitstream/handle/10986/29672/WPS8402.pdf>

Psacharopoulos, G. (1993). "Returns to investment in education: a global update." World Bank Policy Research Working Paper Series 1067.

Qi, H. (2019). "Power relations and the labour share of income in China", Cambridge Journal of Economics 2020, 44, 607–628 doi:10.1093/cje/bez054

Raihan, S. (2020). "Informal institutions, the RMG sector, and the present challenge of export diversification in Bangladesh", Bangladesh Institutional Diagnostic WP20/BDID[05]. <https://edi.opml.co.uk/resource/bangladesh-institutional-diagnostic-chapter-5/>

Rama, M. (2003). Globalization and Workers in Developing Countries. Policy Research Working Paper Series 2958, The World Bank.

Robbins, D. J. (1996). HOS Hits Facts: Facts Win; Evidence on Trade and Wages in the Developing World. Development Discussion Papers. Harvard Institute for International Development, 557.

Rodrik, D. (1988), "Imperfect competition, scale economies and trade policy in developing countries". In R. Baldwin, ed., Trade Policy Industrialization and Development: New Perspectives. Oxford: Clarendon Press

Rowley, C. and Benson, J. (2000) (eds). Globalization and Labour in the Asia Pacific Region. Frank Cass. London.

Ruiz, I. and Vargas-Silva, C. (2009). To Send or Not to Send. That is the Question. A Review of the Literature on Remittances. Journal of Business Strategies. 26(1).pp. 65–90

Sachs, J. D., & Warner, A. (1995). Economic Reform and the Process of Global Integration. Brookings Papers on Economic Activity, 1, 1-118.

Sawada and Estudillo. (2006). Trade, Migration and Poverty Reduction in a Globalizing Economy. UN-Wider Research Paper No. 2006/58. United Nations University and World Institute for Development Economics Research, Finland. Available: http://www.wider.unu.edu/publications/working-papers/research-papers/2006/en_GB/rp2006-58/

Sen, K. (2001). Globalisation and Labour Market Outcomes in the South: a critical survey. Globalisation, Production and Poverty Discussion Paper, 1.

Singer, H.W. (1950), "The Distribution of Gains between the Investing and Borrowing Countries", American Economic Review, 40(2).

Smeeding, T. M., & Thompson, J. (2010). Inequality in the Distribution of Income from Labour and Income from Capital over the Recession. 31st General Conference of The International Association for Research in Income and Wealth, St. Gallen, Switzerland, August 22-28, 2010.

Stanford (2018), "The declining labour share in Australia: Definition, measurement and international comparisons". Journal of Australian Political Economy, No. 81, pp. 11-32.

Strain, M. R. (2019), The Link Between Wages and Productivity Is Strong, Part III: Promoting Private Sector Wage Growth and Job Creation. <https://www.aspeninstitute.org/wp-content/uploads/2019/01/3.2-Pgs.-168-179-The-Link-Between-Wages-and-Productivity-is-Strong.pdf>

Suzuki, K., Oishi, Y. and Paul, S. (2019), "Globalization, Structural Transformation, and the Labor Income Share". Chapter 5 in G. Fields and S. Paul (eds.), Labor Income Share in Asia, ADB Institute Series on Development Economics, https://doi.org/10.1007/978-981-13-7803-4_5

Triggs, A. and Urata, S. (2020). Achieving Inclusive Growth in the Asia Pacific. ANU Press, The Australian National University. <https://press-files.anu.edu.au/downloads/press/n6674/pdf/book.pdf>

Vernon, R. (1966), "International Investment and International Trade in the Product Cycle", Quarterly Journal of Economics, 80: 190-207.

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. Econometrica, 48, 817-838.

Wood, A., and Ridao-Cano, C. (1999). Skill, Trade and International Inequality. Oxford Economic Papers, 51, 89-119.

Wood, A. (1994). North-South Trade, Employment and Inequality: Changing Fortunes in a Skilled-Driven World. Oxford: Clarendon Press.

Zhana, Q., Zenga, X., Wangc, Z. and Mua, X. (2020). "The influence of minimum wage regulation on labor income share and overwork: evidence from China", ECONOMIC RESEARCH, 2020, VOL. 33, NO. 1, 1729–1749 <https://doi.org/10.1080/1331677X.2020.1762104>

Zhou, M. (2016). Labor's Share of Income Another Key to Understand China's Income Inequality. Springer, Singapore 2016

Zhuang, J. (2018). "The Recent Trend of Income Inequality in Asia and How Policy Should Respond". Working Paper commissioned by the Group of 24 and Friedrich-Ebert-Stiftung New York. https://www.g24.org/wp-content/uploads/2018/10/Rising_income_inequality_in_Asia.pdf

Zhuang, J., Kanbur, R. and Rhee, C. (2012), "What drives Asia's rising inequality?" Chapter 2 in Kanbur, R., Rhee, C. and Zhuang, J. (eds) *Inequality in Asia and the Pacific: Trends, drivers, and policy implications*. Asian Development Bank and Routledge