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Gary Fields
Saumik Paul *Editors*

Labor Income Share in Asia

Conceptual Issues and the Drivers

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Preface

The functional distribution of income has always been a topic of concern for economists. David Ricardo's statement, published back in 1817, serves as a testimony to this fact: *To determine the laws which regulate [this] distribution is the principal problem in political economy*. The study of factor income shares plays an important role in understanding the relationship between national income and personal income, the relationship between wage inequality and wealth inequality, and how they link to overall income inequality and concerns for fairness in different sources of income.

The labor income share is defined as the share of national income paid in wages. In contrast to its simple definition of the labor income share, which is the share of labor income in national income, measuring it with available data is not so straightforward. While national income is easily found in national accounting statistics in the form of GDP, labor income equivalent is not as it involves both incomes earned by wage employees and income earned by the self-employed. National accounting statistics in many countries usually record the total wage bill of employees as "compensation of employees." However, these statistics often do not record self-employed income, and even if they do, it is generally difficult to isolate a labor income component as self-employed income consists of compensation for both the labor and capital that self-employed workers own.

In the world including developing Asia, labor income share exhibits three major trends. The first is a trend toward falling labor income share in the world. The second is falling labor income share in advanced and emerging economies taken separately. The third is a wide diversity of country experiences. The growing concern over the decline in the labor income share has encouraged debate about fair distribution of personal incomes, due to the disproportionate share of the decline among different skill groups. While the labor income share has decreased for low-skilled workers, this has coincided with an increase for high-skilled workers. The literature offers several explanations, but there is little consensus on the drivers of the decline in the labor income share.

To understand more deeply the causes and consequences of the changes in labor's income share in developing Asia, in June 2018, the Asian Development Bank Institute hosted a conference entitled *Labor Income Share in Asia: Conceptual Issues and the Drivers*. Part I of this book reviews the prior literature and the conceptual issues related to the measurement of the labor income share, while Part II summarizes the principal theoretical and empirical advances emerging from the conference and raises some consequent policy considerations.

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Chapter 1
Previous Literature and New Findings

Gary Fields and Saumik Paul

1 Previous Literature

1.1 Measurement Issues

1.1.1 Attempts Have Mostly been Made to Estimate Labor Income Share at the National Level, not at a More Disaggregated Level (Sector or Firm)

The United Nations System of National Accounts (UN SNA) collects information on the compensation of employees and provides the unadjusted labor income share for 93 low- and middle-income countries with an average time span of 15.3 years per country. Since only about one third of developing countries report mixed income, the mixed-income adjusted labor income shares are computed for only 38 countries from this dataset. The adjusted labor share using the employment structure of a country is also calculated with ILO's data of Key Indicators of the Labour Market (KILM), which produces estimates for 73 countries. The second group of data sets extend the coverage of data from UN SNA and KILM by including additional national data sources. The Penn World Tables (PWT) expands the coverage of self-employed-income adjusted labor income shares by using proxy variables for countries whose mixed-income data is not available. As most self-employed workers in low- and middle-income countries are active in

The authors are thankful to Juzhong Zhuang for many helpful comments and sharing the data for Figure 5.

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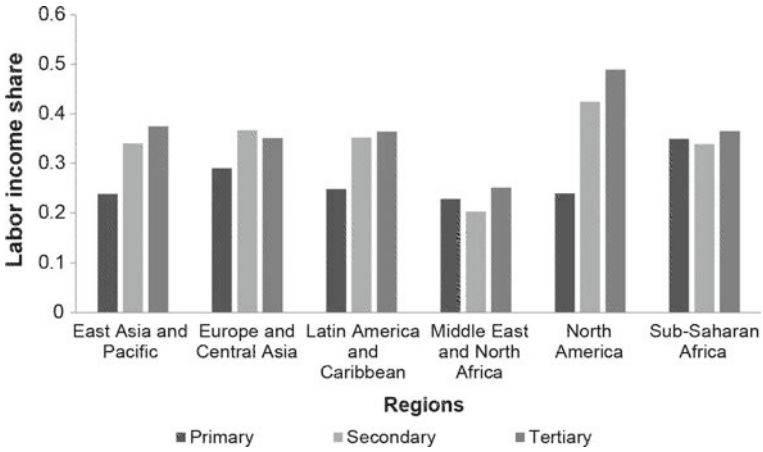

Fig. 1 Labor income share (broad sectors) across regions. *Source* Oishi and Paul (2018). *Note* The definition of the sectors follows the Groningen Growth Data Center (GGDC) classification of sectors. The primary sector consists of agriculture, hunting, forestry, fishing, mining and quarrying. The secondary sector consists of manufacturing and construction. The tertiary sector contains gas and water supply, wholesale and retail trade, hotels and restaurants, transport, storage, and communication, finance, insurance, real estate and business services, government services and community, social and personal services

agriculture, PWT uses value added in agriculture recorded in the World Input Output Database (WIOD) as a proxy for self-employed income. Trapp (2015) also uses proxy variables of agriculture to compute the labor income share. A recent study by Oishi and Paul (2018) puts together 10-sector labor income share data for 54 countries including 20 developing countries. Figure 1 compares the unweighted regional averages of the labor income share across three broad categories using data from Oishi and Paul (2018). On average, labor receives the smallest share of income in the primary sectors in all the regions except the Middle East and North Africa (MENA) and Sub-Saharan Africa (SSA).

1.1.2 Various Adjustment Methods Have been Suggested to Approximate the Labor Income Share

Gollin (2002) proposes three adjustment approaches to include income from self-employment in the labor income. The first approach adds the entire amount of mixed income to compensation of employees based on the assumption that activities related to self-employment do not possess capital. The second one assumes that the labor income share of workers in self-employment is the same as that of wage employees. Gollin (2002)'s third approach assumes that, on average, wages from self-employment is equivalent to wages earned elsewhere. A conventional approach divides total compensation of employees by GDP without taking income from self-employment into consideration. This could be a reasonable approximation of

the labor income share in developed countries where the share of self-employment is low, but this is likely to underestimate the labor income share in developing countries where self-employment in the informal sector is prevalent.

1.2 Theoretical Considerations in Labor's Changing Income Share

1.2.1 The Assumption of a Non-unitary Elasticity of Substitution (σ) Between Capital and Labor Plays a Crucial Role in the Movement of the Labor Income Share

The crucial role of σ in analyzing the factor income shares has been noted since the seminal work of Hicks (1932) and Robinson (1933). In a CES production function (Eq. 1), assuming constant returns to scale, capital-augmenting (A) and labor-augmenting (B) technological progress and perfectly competitive factor markets, there is a stable relationship between the labor income share, the elasticity of substitution (σ) and capital-output ratio. Under these assumptions and using the aggregate production function (1)

$$Y = \left[(AK)^{\frac{\sigma-1}{\sigma}} + (BL)^{\frac{\sigma-1}{\sigma}}\right]^{\frac{\sigma}{\sigma-1}}, \tag{1}$$

the labor income share can be derived as

$$L_S = \frac{(BL)^{\frac{\sigma-1}{\sigma}}}{(AK)^{\frac{\sigma-1}{\sigma}} + (BL)^{\frac{\sigma-1}{\sigma}}} \tag{2}$$

and the capital-output ratio as

$$k = \left[\frac{(AK)^{\frac{\sigma-1}{\sigma}}}{(AK)^{\frac{\sigma-1}{\sigma}} + (BL)^{\frac{\sigma-1}{\sigma}}}\right]^{\frac{\sigma}{\sigma-1}} \tag{3}$$

Combining (2) and (3), we get

$$L_S = 1 - (k)^{\frac{\sigma-1}{\sigma}}. \tag{4}$$

The expression for the labor income share in Eq. (4) is called the "SK" schedule (Bentolila and Saint-Paul 2003), which shows a functional relationship between the labor income share, σ and capital-output ratio. When $\sigma > 1$ i.e., labor and capital are gross substitutes, availability of more capital per unit of labor reduces the labour

income share as the capital price goes down. This is known as "Accumulation view". Similarly, when $\sigma < 1$, i.e., labour and capital are gross complements, a higher k increases the labour income share.

1.2.2 Using the Model Just Presented in Eqs. (1)–(4), a Fall in the Relative Price of Capital Produces a Declining Labor Income Share Provided that Capital and Labor are Gross Substitutes at the Aggregate Level (i.e., $\sigma_{\text{Agg}} > 1$). However, in the Case of More Than One Skill Category of Labor, It Is Possible for the Labor Income Share to Decrease When the Relative Price of Capital Falls Even When Capital and Labor are Gross Complements at the Aggregate Level

Consider a labor market with skilled and unskilled workers. A nested-CES production function production function with three inputs, capital (K), skilled labor (S) and unskilled labor (U), can be written as

$$Y = \left[\theta\left[\emptyset K^{\frac{\rho-1}{\rho}} + (1-\emptyset)S^{\frac{\rho-1}{\rho}}\right]^{\frac{\rho}{\rho-1}\frac{\sigma-1}{\sigma}} + (1-\theta)U^{\frac{\sigma-1}{\sigma}}\right]^{\frac{\sigma}{\sigma-1}} = N_1(K,S) + N_2(U) \tag{5}$$

θ and $\emptyset$ denote distribution parameters; σ denotes the elasticity of substitution between K and U (similarly, between U and S). The sub-processes N_1 (with inputs K and S) and N_2 (with just input U) are mutually exclusive and exhaustive. In Eq. (5), ρ denotes the intra-nest elasticity of substitution between K and S and σ denote the inter-nest elasticity of substitution between K and U. We assume that $\sigma > \rho$, i.e., capital is more complementary to skilled labor than to unskilled labor. Following Oberfield and Raval (2014), the relationship between σ_{Agg} can be expressed as a weighted average of σ and ρ $\sigma_{Agg} = (1-\aleph)\sigma + \aleph\rho$, where $\aleph$ represents a heterogeneity index, which takes a value of zero if capital and skilled labor are perfect complements. In the presence of perfectly competitive factor markets, in equilibrium (i.e., when marginal products equal factor prices), the labor income share (L_S) can be written as

$$L_S = \frac{W_S S + W_U U}{y}, \text{ or} \frac{L_S}{1-L_S} = \frac{W_S S}{rK} + \frac{W_U U}{rK} \tag{6}$$

Taking logs and differentiating Eq. (6) with respect to the log of the input-price ratio, we get

$$\frac{d\ log\left(\frac{L_S}{1-L_S}\right)}{d\ log\left(\frac{W_S}{r}\right)} = \frac{d\log\frac{W_S S}{rK}}{d\log\frac{W_S}{r}} + \frac{d\log\frac{W_U U}{rK}}{d\log\frac{W_U}{r}} \tag{7}$$

$\overline{W}$ is the average wage in the labor market. If L_S declines, then the sum of the signs of the terms on the right-hand side of Eq. (7) must be negative. In Eq. (7), changes in the ratio of factor income shares become functions of ρ and σ (Anderson and Moroney 1993). This relationship depends on the Morishima elasticities of substitution.[1] It may be shown that

$$\frac{dlog\frac{W_S S}{rK}}{dlog\frac{W_S}{r}} = 1 - MES_{SK}(=\rho) = 1 - \rho \tag{8}$$

$$\frac{dlog\frac{W_U U}{rK}}{dlog\frac{W_U}{r}} = 1 - MES_{UK}(=\sigma) = 1 - \sigma \tag{9}$$

and from (7)–(9), we get

$$\left|\frac{dlog\left(\frac{L_S}{1-L_S}\right)}{dlog\left(\frac{W}{r}\right)}\right| = |1-\rho| + |1-\sigma| \tag{10}$$

Paul (2018) shows that if $\sigma > \rho$ and $\sigma > 1$, then L_S declines with $\rho < 1$ as long as we have $\left|\frac{dlog\frac{W_S S}{rK}}{dlog\frac{W_S}{r}}\right| < \left|\frac{dlog\frac{W_U U}{rK}}{dlog\frac{W_U}{r}}\right|$ or $|1-\rho| < |1-\sigma|$. With $\sigma > 1 > \rho$, it is possible to have an estimate of σ_{Agg} to be less than unity since $\sigma_{Agg} = (1-\aleph)\sigma + \aleph\rho$. In this case, a declining labor income share resulting from a drop in the relative price of capital may not require capital and labor to be gross substitutes at the aggregate level.

1.3 Empirical Findings in the Literature

1.3.1 Both Within Sector Growth and the Process of Structural Transformation are Responsible for the Movements in the Labor Income Share

Changes in the aggregate labor income share between t and $t+1$ can be decomposed into the contribution of various factors using a shift-share decomposition methodology (Fabricant 1942; de Vries et al. 2013). In Eq. 3, LIS_i is the labor

[1] MES holds prices of other factor inputs constant and adjusts the measure of the elasticity of substitution accordingly. MES can be expressed as a function of the own price and the cross-price elasticities of two inputs as $MES_{ij} = \frac{dlogx_i}{dlogp_i} - \frac{dlogx_i}{dlogp_i}$, where p_i and $p_j$are the prices of inputs x_i and x_j. Blackorby and Russell (1989) showed that changes in the ratio of factor income shares can be directly predicted by MES as $\frac{dlog\frac{p_i x_i}{p_j x_j}}{dlog\frac{p_i}{p_j}} = 1 - MES_{ij}$.

income share in sector i, and LIS denotes the aggregate labor income share. Labor is reallocated across sectors between two points in time, t and $t+1$, and VA_i^t denotes the value-added share of sector i in period t.

$$\Delta LIS = \sum_i (VA_i^t)(\Delta LIS_i) + \sum_i (\Delta VA_i)(LIS_i^t) \tag{11}$$

The first term on the right-hand side of Eq. (11) shows the contribution of within-sector changes over time and the second term collects the contribution of or structural transformation. Many studies[2] show that changes in the aggregate labor income share are driven by declines in within-industry labor shares rather than the process of structural transformation through an increasing flow of activities from high to low labor share industries. In another study, Dao et al. (2017) find that almost 90% of the changes in the aggregate labor income shares in PRC come from within-industry changes rather than sectoral reallocation. Arpaia et al. (2009) examine the role of structural transformation for a panel of OECD countries and find dominance of within-sector effects. However, de Serres et al. (2002) estimate that about 50% of the changes in the aggregate labor income share in the US is due to structural transformation across sectors.

1.3.2 Technological Advancement, Measured by the Long-Term Decline in the Relative Price of Investment Goods, Has been the Largest Contributor to the Decline in Labor Income Shares in Advanced Economies

A growing number of empirical analysis suggests that about half of the total decline in labor income shares can be traced to the impact of technology in advanced economies. However, Dao et al. (2017) show that in emerging markets, there is no discernible role of technology in the evolution of labor shares. They also find a relatively mild decline in the relative price of investment goods in emerging economies, which arguably explains the limited role of technology behind the movement in the labor's share of income. On the other hand, while a very extensive literature on skilled-biased technical change provides useful hints, not much work has been done on the impact of different types of capital (Koh et al. 2016) and different types of labor (European Commission 2007; Lawless and Whelan 2011) on the labor income share.

[2]Lawrence (2015), Elsby et al. (2013), Rodrigues and Jayadev (2010)

1.3.3 There is Considerable Diversity in the Movement in the Sectoral Labor Income Share Across Advanced Economies; the Highest Decline in Labor Income Share (in Terms of Percentage Point Differences) in Services and Manufacturing was in Japan and Portugal, Respectively

If the elasticity of substitution between capital and labor is different from one and varies across sectors (e.g., agriculture versus manufacturing), then the sectoral labor income share trends are likely to follow different trajectories despite identical factor price movements across sectors. Figure 2 shows a scatterplot of 16 countries between changes in the labor income shares in manufacturing and changes in the labor income share in services. We find four categories of countries. Belgium is the only country that had an increase in the labor income share in both sectors. Then we have the next category consisting of Greece, Hungary, Denmark, and Portugal, where the labor income share declined only in the manufacturing sector. Spain, France, and the UK made up the next group of countries that had a drop in the labor income share only in services. Finally, the largest group of countries (Australia, Austria, Finland, Japan, Italy, Germany, Sweden, and the Netherlands) shows declining labor income shares in both sectors.

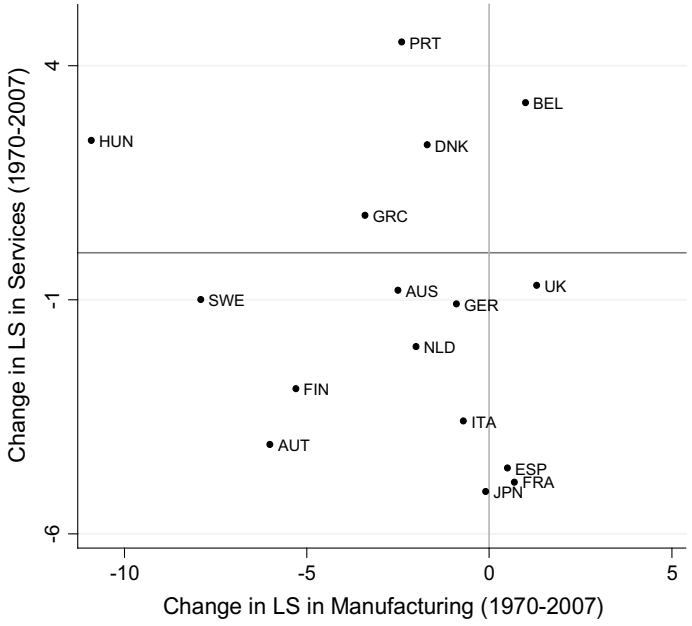

Fig. 2 Changes in labor income shares: manufacturing versus services, 1970–2007. *Source* Cuadrado et al. (2015); original data source: http://www.euklems.net

1.3.4 We Now Turn to Changes in Labor Income Share at a More Disaggregated Sectoral Level. In Japan, the Labor Income Shares Remained Almost Constant in Heavy Manufacturing and Light Manufacturing Whereas the Other Sectors Showed Downward Trends in the Period from 1970 to 2010.

During the same period, we observe the secular trends of structural transformation: employment shares rising in services, falling in agriculture, and remaining unchanged in manufacturing. We use the Japan Industrial Productivity (JIP), which covers 108 industries for the period 1970–2012. We divide 108 industries into six broad categories of sectors. *Agri* consists of agriculture, forestry, and fisheries. *Heavy manufacturing* comprises mining, chemicals, petroleum, fabricated metals, machinery, construction, and electrical machinery. *Light manufacturing* consists of food, textiles, pulp, nonmetallic minerals, primary metals, transport equipment, precision instruments, and other manufacturing. *Utilities* include electricity, gas, and water supply. *Commerce* consists of wholesale and retail trade, finance and insurance, real estate, transport, and communication. We include both private services and government services in *Services*. Figure 3 shows labor income share trends for these six broad sectors.

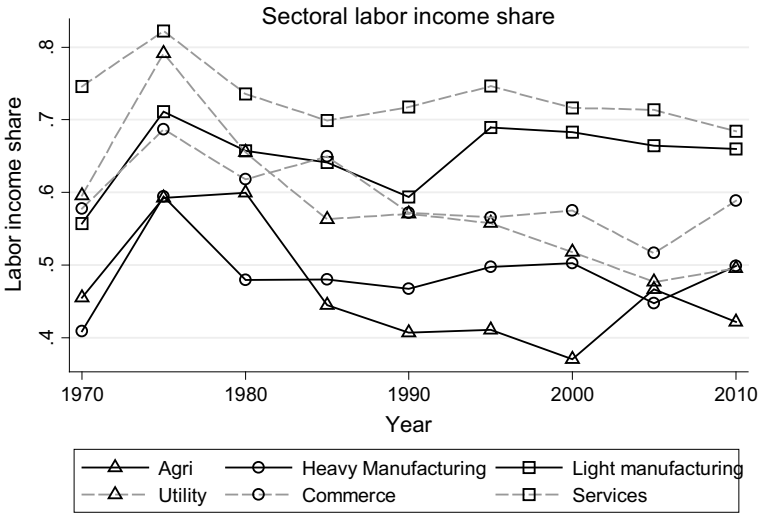

Fig. 3 Sectoral labor income and employment share in Japan, 1970–2010. *Source* Authors' calculation based on the Japan Industrial Productivity (JIP) database https://www.rieti.go.jp/en/database/JIP2015/#01, and Regional-Level Japan Industrial Productivity (R-JIP) database, http://www.rieti.go.jp/en/database/r-jip.html. The latter data set consists of 23 sectors. We divide them into six broad categories

1.3.5 In the People's Republic of China, There is a Steady Downward Labor Income Share Trend in Government (GOV) and Mining (MIN) Sectors Since the Early 1990s, Whereas Wholesale and Retail Trade (WRT) and Finance, Insurance and Related Business Services (FIRE) Show an Upward Trend

We use a recent data set compiled by Oishi and Paul (2018). This paper creates a novel dataset on the labor income share at the disaggregated 10-sector level following the classification of the Groningen Growth Data Centre (GGDC).[3] Various issues stem from the accounting method of national income, treatment of intangible inputs, measurement of non-private sectors and informal sectors, and attribution of mixed income. We use three data sources, the GGDC 10-Sector Database, the Socio-Economic Account (SEA), and ILOSTAT. We obtain the denominator of the labor income share, estimated value added, from the GGDC and SEA. For the numerator, we obtain the mean nominal monthly earnings of employees and the number of employees from ILOSTAT. For the People's Republic of China, data are available for 7 sectors (MIN, MAN, PU, WRT, TRA, FIRE, and GOV) for the period from 1986 to 2007. Figure 4 plots the time series of the estimates of the labor income share for 7 sectors. We find a steady downward trend in GOV and MIN since the early 1990s, whereas WRT and FIRE show an upward trend. One possible reason for the declining labor income share in MIN could be that MIN has become more capital intensive over time. The labor income share is the smallest in PU, followed by MIN and manufacturing.

1.3.6 Across the Asian Countries, Most Sectors Experienced a Decline in Labor Share of Income in Recent Years, Except China Where Most Sectors Experienced an Increase in the Labor Income Share in Recent Years

Figure 5 shows percentage point changes in the sectoral labor income share for 17 Asian economies from mid-2000s to early 2010s. The graph in the top panel suggests a decline in the labor income share in all the sectors except Wholesale and Retail, Construction, and Real Estate for 16 Asian countries on average, excluding China, between 2005 and 2011. The graph in the bottom panel shows results for China where most sectors experienced an increase in the labor share of income between 2005 and 2012, except Finance and Insurance and Other Services. It should be noted that earlier studies suggest that China also experienced a significant decline in the labor income share, especially in the manufacturing sector, between

[3] 1. Agriculture, hunting, forestry and fishing (AGR); 2. Mining and quarrying (MIN); 3. Manufacturing (MAN); 4. Electricity, gas and water supply (PU); 5. Construction (CON); 6. Wholesale and retail trade, hotels and restaurants (WRT); 7. Transport, storage, and communication (TRA); 8. Finance, insurance, real estate and business services (FIRE); 9. Government services (GOV); 10. Community, social and personal services (OTH).

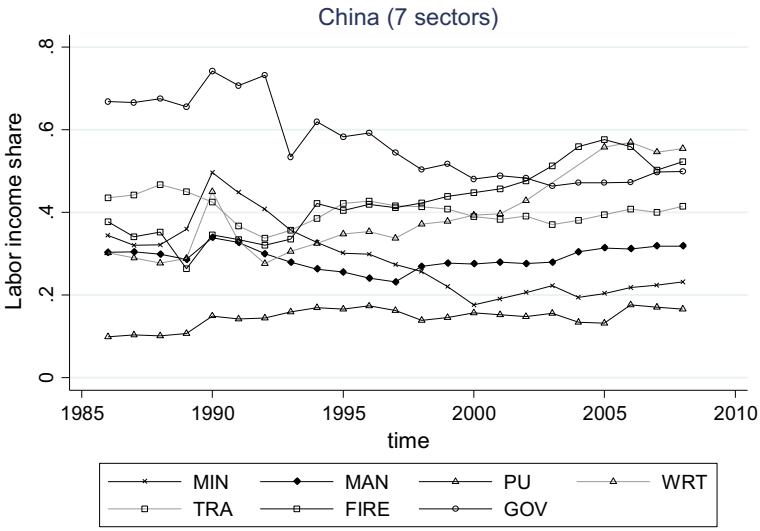

Fig. 4 Sectoral labor income share in the People's Republic of China, 1985–2010. *Source* Oishi and Paul (2018)

the early 1990s and mid-2000s (see, for example, Zhuang (2016), "Understanding Recent Trends of Income Inequality in China", ADB Economics Working Paper Series, No. 489). The recent increase in the labor income share in China, including the manufacturing sector, is likely to have been caused by government policy measures to address rising income inequality, such as raising the minimum wages and mandatory contributions to various social insurance schemes by enterprises, and a decline in rural surplus labor causing labor shortages and rising wages in the coastal areas.

2 The Contributions of the Chapters in This Volume

2.1 Part I. Conceptual Issues

The more exposed a country is to routinization, the greater is the probability that mid-skilled jobs are substituted by ICT capital, lowering the overall wage share of workers.

Chapter 2 analyzes the evolutions of the labor share of income in Asia, a region where some Asian countries had steep increases in labor income share, some had steep decreases, and some had stable shares since 1990. An innovation of this chapter is to expand the standard drivers of labor shares—technological advance, trade, institutions and policies—by considering whether the exposure to routine jobs has also played a role in the evolution of the labor share of income. Using a

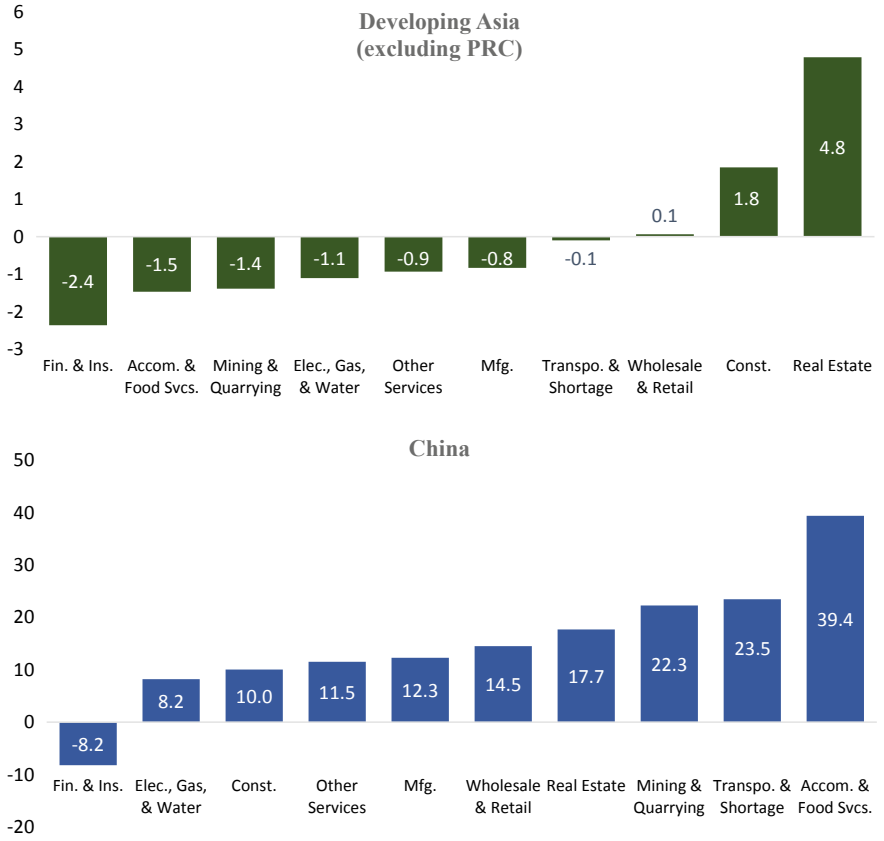

Fig. 5 Percentage point change in the labor share of income in 17 Asian economies, mid-2000s–early 2010s. *Source* Supply and Use Tables for 17 Asian economies (BAN, BHU, BRU, CAM, PRC, FIJ, HKG, INO, IND, MAL, MLD, MON, NEP, SRI, TAP, THA, VIE), ADB

new dataset on the exposure to routinization, the chapter finds that the initial exposure to routinization is an important determinant of the evolution of labor shares.

A new measurement of labor income share is proposed in Chap. 3 based on five different methodologies of estimation commonly used in the labor share literature. Results show that the authors' suggested indicator is correlated to the other five measures, but it also retains unique information.

This chapter presents a global dataset of the labor income share across 151 countries—both developing and developed—for all or part of the period 1970–2015. Contrary to the traditional assumption of stability of factor shares, it documents the existence of considerable heterogeneity across countries and variability over time. Specifically, there has been a general decline in the labor share in the majority of the countries since the mid-1980s.

Institutional differences are not the main source of variation in labor share movements, as the negative trend is common to countries with different regulatory settings.

Chapter 4 investigates the causes of the decline of the labor share exploring the effect of technology vis-à-vis the role played by market regulations, namely Employment Protection Legislation (EPL), Product Market Regulation (PMR), and Intellectual Property Rights (IPRs) protection. The results show that, in the long run, productivity upgrades and ICT capital diffusion are the major sources of the decline in the labor share. IPRs protection is the only dimension of the institutional setting affecting (positively) the share of industry income accruing to labor. The results also show that hysteresis characterizes the dynamics of the labor share in all countries.

Using new cross-country data, both at the national and sectoral level, trade openness is found to be negatively correlated with the labor income share.

Chapter 5 provides new empirical evidence on trade and structural transformation as drivers of the labor income share. Trade openness is negatively correlated with the labor income share, and the empirical findings are robust across national and disaggregated level, and across different model specifications. However, the relationship between the process of structural transformation and labor income share is at best mixed. It also finds weak evidence that skill-biased structural transformation is likely to be positively correlated with the share of labor income predominantly in the services sectors.

Democracy allows workers to achieve a higher share of national income.

Chapter 6 attempts to shed some light on the long-run and political economy determinants of the labor income share. It revisits and extends previous empirical research on democratic political institutions and the labor share using a dataset of 112 countries over the period 1970–2015. The principal finding is that democracy is associate with a higher labor share, and this evidence is robust to different indices of democracy and different periods of time, and after performing instrumental variables estimation. These results are particularly relevant today, considering the recent global decline in the labor income share and current crisis of democracy.

2.2 *Part II. The Drivers of Labor Income Share*

India experienced a sharp decline in labor share from around 30 percent in 1980 to less than 10 percent in 2014. Trade can explain a part of this decline. The results confirm that trade, by dampening the bargaining power of labor, reduces labor share of Indian industries.

Chapter 7 explores if decline in strikes and lockouts, reduced man-days lost from disputes per factory and increased use of contract workers in all major states in India. The author assumes them as the signs of reduced bargaining power. The approach suggested by Levinsohn and Petrin (2003) is applied on 3-digit level of industrial data over major states during 1998–2014, regressing Solow residual

(proxy for productivity) on trade share along with its interaction terms capturing market imperfections. Mark-up tends to rise with trade. The influence of trade on the labor income share and the productivity growth is explained through the channels of mark-up and bargaining power.

> An increase of labor income share in Malaysia is contributed mainly by the growing importance of more traditional services sub-sectors, and SMEs in the economy.

Labor income shares have been falling in many advanced and emerging economies within the last few decades, driven in part by a combination of impacts from technology and increased global integration. This in turn is associated with the relative slow growth of wages, especially for middle-skilled workers, and worsening of income inequality in these economies. In contrast, Malaysia's labor income share has been increasing since 2005, together with a reduction in income inequality. Chapter 8 investigates this development by exploring the differences in trends of labor income shares across different economic sectors and firm sizes and identifying factors that could explain the increase of labor income share in Malaysia. These findings have important policy implications for Malaysia, including the potential trade-off between driving labor productivity and fostering inclusiveness.

> The decline of the labor share observed in Japan during the period of analysis was highly concentrated in the private services sectors, the employment share of which has increased remarkably.

Chapter 9 investigates the long-term drivers of the falling labor share in Japan using data form the Japanese Industrial Productivity database from 1970 to 2012. Descriptive and econometric results indicate the private services sectors experienced a strong increase of non-regular workers, which in Japan identify a secondary segment of the labor market characterized by low wages and very limited union coverage. The low protection of this group of workers and the increase in market power concentration have probably contributed to reducing the bargaining power of labor vis-à-vis employers and, consequently, the labor share.

Firms' labor income share can also depend on the share of regular workers, firms' international engagement and various institutional settings of product and labor markets.

The labor share in Japan has been declining significantly over the last three decades, accompanied by a low economic growth and an unprecedented increase in economic inequalities. The existing literature in Japan is limited and confined to country or industry studies. Chapter 10 is the first attempt to analyse the drivers of the labor share in Japan at firm level. To achieve this aim, it employs a panel of manufacturing firms from the Basic Survey of Japanese Business Structure and Activities spanning from 2001 to 2012. By means of panel data estimations it shows how, besides technological variables, firms' labor share also significantly depends on the share or regular workers and on various institutional settings.

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Part I
Conceptual Issues

Chapter 2
Does the Exposure to Routinization Explain the Evolution of the Labor Share of Income? Evidence from Asia

Mitali Das

Abstract This paper analyzes the evolution of the labor share of income in Asia, a region where countries have experienced steep declines and increases as well as stable labor income shares in the quarter-century since 1990. An innovation of this study is to expand the standard drivers of labor shares—technological advance, trade, institutions, and policies—by considering whether the exposure to routine jobs has also played a role in the evolution of the labor share of income. The more exposed a country is to routinization, the greater is the probability that ICT capital substitutes mid-skilled jobs, lowering the overall wage share of workers. Using a new dataset on the exposure to routinization, the study finds that it is an important determinant of the evolution of labor shares in developed Asian economies, where the initial exposure was high, but not in developing Asian economies where the share of routine jobs was small.

JEL Classification C23 · E24 · E25 · O33

1 Introduction

After decades of relative stability, labor income shares began to decline globally in the 1980s (Fig. 1). A deeper examination of the country evolutions behind the global decline, as Fig. 1 shows, indicates, however, that this evolution was remarkably heterogeneous both across and within regions (Fig. 2). North and South America, Europe, Asia, and Africa witnessed declining and rising as well as stable labor shares of income. For example, within Asia, the labor share of income fell in Japan and the People's Republic of China (PRC) but rose in Malaysia and Thailand and remained relatively stable in Singapore (Fig. 3). However, on the global scale, the labor shares of income declined in the largest economies of the world, including

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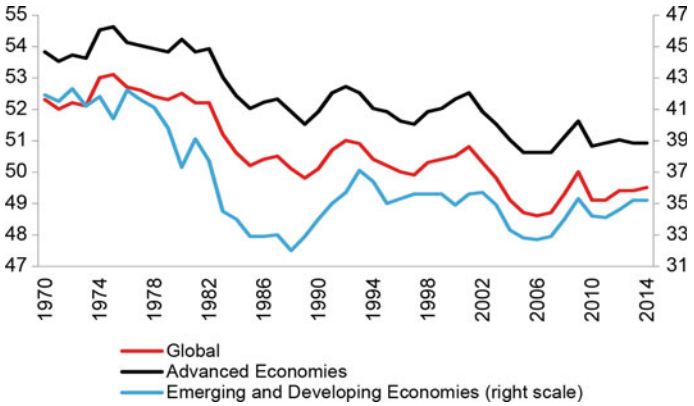

Fig. 1 Evolution of the labor share of income (%). *Sources* National authorities and IMF staff calculations

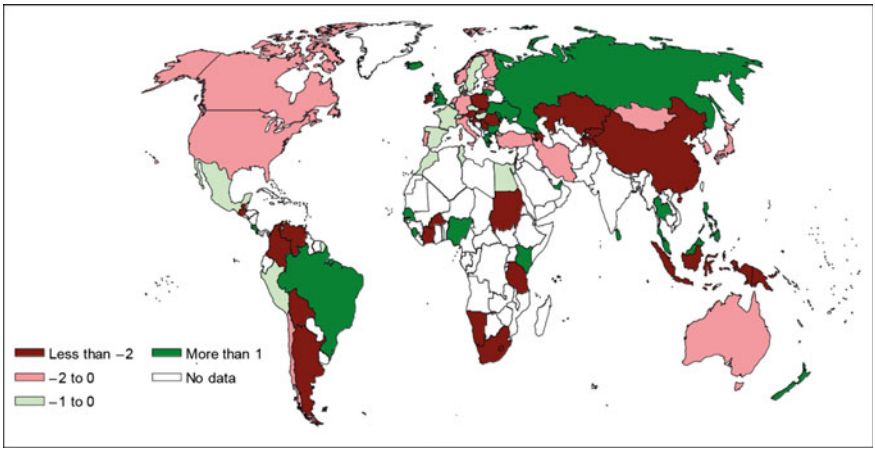

Fig. 2 Trends in the labor share of income (percentage points per 10 years). *Sources* National authorities; and IMF staff calculation. *Note* This world map shows the labor share trend of countries with at least 10 years of data, starting from 1990

four of the five largest economies and eight of the largest ten, resulting in the observed (GDP-weighted) decline in the global labor share of income.

This paper will discuss the evolution of the labor shares within Asia, a region that has not received much attention in the literature relative to the large body of work that has examined the decline in the labor share of income in the United States and in advanced economies more generally (see e.g., Blanchard 1997; IMF 2007; Karabarbounis and Neiman 2014). Asia is particularly interesting, because its constituent countries are highly diverse along many dimensions. For example, Asia includes a heterogeneous set of countries in terms of their economic development,

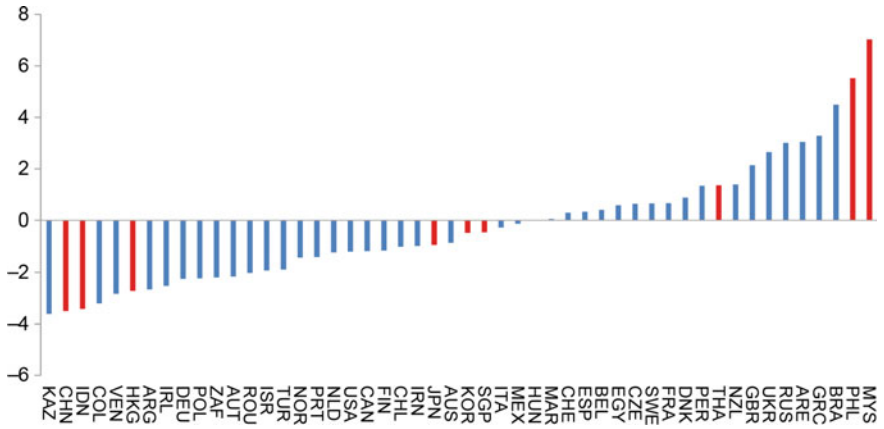

Fig. 3 Evolution of Asian labor shares, in global perspective (percentage points per 10 years). *Notes* and *Sources* Data are from National Authorities. Figure shows the trend change in labor shares for countries with at least 10 years of data, starting in 1990

consisting of developed economies such as Japan, large emerging economies such as the PRC, Malaysia, and Thailand, newly industrialized economies such as Singapore and Hong Kong, China, and lower-income countries such as the Philippines.[1] Countries within Asia also have remarkable diversity in demographics, technological advancement, and trade linkages with countries within and outside Asia, which may be relevant factors in analyzing the evolution of the labor share of income.

To date, the understanding of the forces behind this striking—though heterogeneous—decline in the labor share is not complete. However, the recognition of the global nature of its evolution—through the peaks and troughs of domestic business cycles and over a period that has experienced profound structural transformation in advanced and emerging economies alike—has led to an emerging consensus that the primary forces behind this evolution are likely to be global as well, with varying impacts across countries reflecting varying exposures to common global factors. In recent years, authors have advanced hypotheses that have narrowed these forces down to two key factors: the globalization of trade and capital (see e.g., Elsby et al. 2013; Dao et al. 2017) and technological changes (e.g., Karabarbounis and Neiman 2014).

Concerning technological advancement, the hypothesis is that the rapid advance of technology has lowered the relative price of investment goods and thereby

[1]The data for the labor share of income are from official sources and Dao et al. (2017). Official data are unavailable for certain Asian countries, including India, Bangladesh, and Cambodia.