



# Labor Income Share

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## Understanding the Drivers of the Global Decline

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SAUMIK PAUL

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ISBN 978-981-15-6859-6      ISBN 978-981-15-6860-2 (eBook)  
<https://doi.org/10.1007/978-981-15-6860-2>

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The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

## ACKNOWLEDGMENTS

This book is an outcome of roughly four years of work on labor income share. It would not have been completed without the support and contribution of many people. I sincerely thank Cristiano Perugini for introducing me to this topic. Cristiano was a visiting scholar at Hitotsubashi University back in 2017. I had a series of idle chats in between intense discussions with Cristiano and Kyoji Fukao that later helped me formulate the idea of writing this book. In 2018, the Asian Development Bank Institute hosted a conference on “Labor Income Share in Asia: Conceptual Issues, Drivers, and Policy Considerations.” The proceedings of this conference were published in 2019 as a book volume edited by Gary Fields and me. Working with Gary during this time has helped to shape up many parts of this book. I thank (in alphabetical order) Robert Chirinko, Mitali Das, Marta Guerriero, Kyoji Fukao, Dibyendu Maiti, Debdullal Mallick, Naoyuki Yoshino, and other conference participants at the Asian Development Bank Institute for their feedback on my work.

Parts of Chaps. 4, 5, and 6 have been presented in various seminars and conferences. I am grateful for the comments I received from Cristiano Antonelli and Fabio Berton at the University of Turin; Davide Fiaschi and Angela Parenti at the University of Pisa; Raffaele Miniaci and Maria Laura Parisi at the University of Brescia; Silvia Marchesi and Tania Masi at the University of Milano-Bicocca; Cristiano Perugini, Fabrizio Pompei, and Francesco Venturini at the University of Perugia; Francesco Pastore at the University of Campania Luigi Vanvitelli; Atanu Ghoshray, John Sessions, and Wessel Vermeulen at Newcastle University; Praveen Kujal and Michela Vecchi at Middlesex University; and other seminar participants at the

University of Brescia, University of Pisa, University of Perugia, University of Milano-Bicocca, University of Campania Luigi Vanvitelli, Middlesex University, and Newcastle University. Chapters 3, 4, 5, and 7 involved a large amount of data work. My sincere thanks (in alphabetical order) to Hironobu Isaka, Saloni Lakhia, Abdelbari Lakhim, Yoko Oishi, Ken Suzuki, and Liam Thomas for excellent research assistance. Liam has also provided timely support in editing some of the chapters.

I thank my colleagues at Hitotsubashi University, the Asian Development Bank Institute (Tokyo), and Newcastle University (UK) for their encouragement and support. My gratitude to Silvia Marchesi for hosting me at the University of Milano-Bicocca in 2019, where the bulk of this book was drafted. My sincere thanks go to Gabrielle Cimenilli and Asier Mariscal for providing many helpful comments on my paper on “Capital-Skill Complementarity and Labor Income Share,” and Tim Gindling and Daniel Hammermesh for their useful comments on my paper titled “Understanding the Global Decline in the Labor Income Share.”

I thank my father, Dilip Paul, for his encouragement throughout. My wife Ronita and our daughters, Siya Pritha and Sayuri Radha, were happy to see me writing a book. I thank my family for their continuous encouragement and for gracefully accepting the cyclic nature of life that “downs” are as much a part of life as “ups” are, while I have been completing this book project.

# CONTENTS

<b>1</b>	<b>Introduction</b>	<b>1</b>
	<i>References</i>	<b>6</b>
<b>2</b>	<b>Definition, Measurement, and Conceptual Issues</b>	<b>7</b>
2.1	<i>Definition of Labor Income Share</i>	7
2.2	<i>Conceptual Issues</i>	11
2.2.1	<i>Gross and Net Labor Income Share</i>	11
2.2.2	<i>Labor Income Share and Competition Decline</i>	12
2.2.3	<i>Labor Income Share and Information Technology</i>	13
2.2.4	<i>Labor Income and Intellectual Property Products</i>	13
2.2.5	<i>Evaluation of the Downward Trend in Labor Income Share</i>	14
2.3	<i>Self-Employment and Labor Income Share</i>	15
2.3.1	<i>A Conceptual Framework</i>	17
2.3.2	<i>Identification of Earnings Ratio (<math>\xi</math>) Across Sectors</i>	17
2.3.3	<i>Identification of Employment Ratio (<math>\varphi</math>) Across Sectors</i>	21
2.4	<i>Adjusted Versus Unadjusted LIS</i>	26
	<i>References</i>	29
<b>3</b>	<b>Global Trends in Labor Income Share: Country Level</b>	<b>31</b>
3.1	<i>Data</i>	31
3.2	<i>Gross Domestic Product (GDP) and the Labor Income Share</i>	36
3.3	<i>Informal Sector and the Labor Income Share</i>	42

3.4	<i>Self-Employment and the Labor Income Share</i>	45
3.5	<i>Trade and the Labor Income Share</i>	47
3.5.1	<i>Agricultural Trade and the Labor Income Share</i>	53
3.5.2	<i>Non-agricultural Trade and the Labor Income Share</i>	59
3.6	<i>Agriculture and the Labor Income Share</i>	66
	<i>References</i>	70
<b>4</b>	<b>Global Trends in Labor Income Share: Sector Level</b>	<b>73</b>
4.1	<i>Data</i>	73
4.1.1	<i>Data Sources and Country Coverage</i>	73
4.1.2	<i>Methodology</i>	80
4.2	<i>Descriptive Evidence</i>	84
4.2.1	<i>Cross-Country Comparison by Sectors</i>	85
4.2.2	<i>Country Case Studies</i>	86
4.3	<i>Manufacturing Versus Services</i>	89
	<i>Appendix 1. Employment by Sex and Economic Activity (Thousands)</i>	95
	<i>Part 1: Countries Covered by the GGDC 10-sector Database</i>	96
	<i>Part 2: Countries Covered by the Socio-Economic Account</i>	106
	<i>Appendix 2. Notes on Earnings Data</i>	117
	<i>Part 1: Countries Covered by the GGDC 10-sector Database</i>	117
	<i>Part 2: Countries Covered by the Socio-Economic Account</i>	129
	<i>Appendix 3. Ambiguous and Unambiguous Labor Income Share</i>	140
	<i>Appendix 4. Aggregation Scheme</i>	141
	<i>Appendix 5. Currency Adjustment for Revaluation and Introduction of New Currency</i>	142
	<i>References</i>	143
<b>5</b>	<b>Global Trends in Labor Income Share: Firm Level</b>	<b>145</b>
5.1	<i>Data</i>	145
5.1.1	<i>Data Sources and Coverage</i>	145
5.1.2	<i>Alternative Definitions of Labor Income Share</i>	152
5.2	<i>Descriptive Evidence</i>	154
5.2.1	<i>Labor Income Share Trends Using Definition 1</i>	156
5.2.2	<i>Labor Income Share Trends Using Definition 2</i>	160
5.2.3	<i>Labor Income Share Trends Using Definition 3</i>	163
5.3	<i>Comparison of LIS1, LIS2, and LIS3</i>	168
	<i>References</i>	171

<b>6</b>	<b>The Economic Forces Behind Labor Income Share: Theory</b>	<b>173</b>
6.1	<i>Production Technology</i>	174
6.2	<i>The Role of Elasticity of Substitution Between Capital and Labor (<math>\sigma</math>)</i>	175
6.2.1	<i>Changes in the Labor Income Share with Homogeneous Labor Market</i>	177
6.3	<i>Changes in the Labor Income Share with Heterogeneous Labor Market</i>	179
6.3.1	<i>Comparative Statics of LIS</i>	181
6.3.2	<i>Comparative Statics of LIS Using the Morishima Elasticity of Substitution</i>	182
	<i>References</i>	187
<b>7</b>	<b>The Economic Forces Behind Labor Income Share: Empirics</b>	<b>189</b>
7.1	<i>Technological Change</i>	189
7.1.1	<i>SBTC, Capital-Augmenting, and Labor-Augmenting Technological Change</i>	190
7.1.2	<i>Labor Income Share Dynamics with Variable Elasticity of Substitution</i>	195
7.2	<i>Globalization</i>	199
7.2.1	<i>Trade Liberalization and Labor Income Share: Country Level</i>	199
7.2.2	<i>Trade Liberalization and Labor Income Share: Country Level</i>	202
7.2.3	<i>Trade Liberalization and Labor Income Share: Sectoral Level</i>	210
7.3	<i>Structural Transformation</i>	218
7.3.1	<i>Sectoral Labor Income Share</i>	218
7.3.2	<i>Labor Share in Manufacturing and Service Sectors</i>	220
7.3.3	<i>Skill-Biased Structural Transformation and Labor Income Share</i>	223
7.4	<i>Structural Transformation, Trade, and Labor Income Share</i>	224
7.4.1	<i>Regression Outcomes</i>	224
7.4.2	<i>Case Study: Japan</i>	231
7.5	<i>Institutional Change</i>	240
	<i>References</i>	242

<b>8</b>	<b>Potential Areas of Future Research</b>	<b>251</b>
8.1	<i>LIS and Personal Income Inequality</i>	251
8.2	<i>LIS and Skilled Emigration</i>	253
8.3	<i>LIS, Remittances, and Brain-Gain</i>	256
8.4	<i>LIS, Remittances, and Negative Labor Supply</i>	258
8.5	<i>LIS and Premature Deindustrialization</i>	259
8.6	<i>LIS and Firm Restructuring</i>	260
8.7	<i>LIS and Globalization at the Sectoral Level</i>	262
	<i>References</i>	263
<b>9</b>	<b>Concluding Remarks</b>	<b>267</b>
	<b>References</b>	<b>271</b>

# LIST OF FIGURES

Fig. 2.1	The microdata-based adjustment versus rule of thumb (G3 and variants). (Source: International Labour Organization (ILO), 2019)	16
Fig. 2.2	Self-employment and productivity (GDP per hour worked) in OECD countries. (Source: Authors' calculation based on OECD database. <a href="https://data.oecd.org/">https://data.oecd.org/</a> . Note: Self-employment rate is averaged for the period between 2000 and 2018. GDP (in 2010 USD) per hour worked is also averaged between 2000 and 2018)	19
Fig. 2.3	Earnings ratio by key sectors I. (Source: Authors' calculations using Life in Transition Survey (LiTS) II data. Note: The group of countries varies across sectors because data is not available for each country-sector group. We use the same country ranking in agriculture (based on the earnings ratio) for other sectors for the sake of comparison)	21
Fig. 2.4	Earnings ratio by key sectors II. (Source: Authors' calculations using Life in Transition Survey (LiTS) II data. Note: The group of countries varies across sectors because data is not available for each country-sector group. We use the same country ranking in manufacturing (based on the earnings ratio) for other sectors for the sake of comparison)	22
Fig. 2.5	Employment ratio by key sectors I. (Source: Authors' calculations using Life in Transition Survey (LiTS) II data)	23
Fig. 2.6	Employment ratio by key sectors II. (Source: Authors' calculations using Life in Transition Survey (LiTS) II data)	23

Fig. 2.7	Employment ratio in the United States, 2003. (Source: Steven 2004)	24
Fig. 2.8	Employment ratio by sector: trends in Japan, 1953–2003. (Source: Authors' calculations)	25
Fig. 2.9	Adjusted versus unadjusted LIS estimates. (Source: Authors' own calculations)	28
Fig. 3.1	The GDP and the labor income share: full sample of countries. (Source: The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	36
Fig. 3.2	The GDP and the labor income share, by income groups. (Source: The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	37
Fig. 3.3	The GDP per capita and the labor income share: full sample of countries. (Source: The GDP per capita figures are taken from calculations by Gollin et al. (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	38
Fig. 3.4	The GDP per capita and the labor income share, by income groups. (Source: The GDP per capita figures are taken from calculations by Gollin et al. (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	39
Fig. 3.5	The log GDP and the labor income share: full sample of countries. (Source: The log GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	40
Fig. 3.6	The GDP per capita and the labor income share, by income groups. (Source: The log GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	41
Fig. 3.7	The informal sector and the labor income share: full sample of countries. (Source: The informal sector GDP figures are taken from LaPorta and Shleifer (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	42
Fig. 3.8	The informal sector and the labor income share, by income groups. (Source: The informal sector GDP figures are taken from LaPorta and Shleifer (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	43

Fig. 3.9	VA per worker ratio between informal and formal sector and the labor income share. (Source: The value added per worker ratio of informal and formal sector figures is taken from LaPorta and Shleifer (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	44
Fig. 3.10	The self-employment share and the labor income share: full sample of countries. (Source: The self-employment share figures are taken from LaPorta and Shleifer (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	45
Fig. 3.11	The self-employment share and the labor income share, by income groups. (Source: The self-employment share figures are taken from LaPorta and Shleifer (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	46
Fig. 3.12	Trade volume and the labor income share: full sample of countries. (Source: The figures on trade volume are taken from Tombe (2015). The figures on GDP and labor income share are calculations taken from Karabarbounis and Neiman (2014) using UN and OECD data)	48
Fig. 3.13	Trade volume and the labor income share: by income groups. (Source: The figures on trade volume are taken from Tombe (2015). The figures on GDP and labor income share are calculations taken from Karabarbounis and Neiman (2014) using UN and OECD data)	49
Fig. 3.14	Import volume and the labor income share: full sample of countries. (Source: The figures on import volume are taken from Tombe (2015). The figures on GDP and labor income share are calculations taken from Karabarbounis and Neiman (2014) using UN and OECD data)	50
Fig. 3.15	Import volume and the labor income share, by income groups. (Source: The figures on import volume are taken from Tombe (2015). The figures on GDP and labor income share are calculations taken from Karabarbounis and Neiman (2014) using UN and OECD data)	51
Fig. 3.16	Export volume and the labor income share: full sample of countries. (Source: The figures on export volume are taken from Tombe (2015). The figures on GDP and labor income share are calculations taken from Karabarbounis and Neiman (2014) using UN and OECD data)	52

Fig. 3.17	Export volume and the labor income share, by income groups. (Source: The figures on export volume are taken from Tombe (2015). The figures on GDP and labor income share are calculations taken from Karabarbounis and Neiman (2014) using UN and OECD data)	53
Fig. 3.18	Agricultural trade and the labor income share: full sample of countries. (Source: The agriculture trade volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	54
Fig. 3.19	Agricultural trade and the labor income share, by income groups. (Source: The agriculture trade volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	55
Fig. 3.20	Agricultural import and the labor income share: full sample of countries. (Source: The agriculture import volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	56
Fig. 3.21	Agricultural import and the labor income share, by income groups. (Source: The agriculture import volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	57
Fig. 3.22	Agricultural export and the labor income share: full sample of countries. (Source: The agriculture export volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	58
Fig. 3.23	Agricultural export and the labor income share, by income groups. (Source: The agriculture export volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	59
Fig. 3.24	Non-agricultural trade and the labor income share: full sample of countries. (Source: The non-agriculture trade volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	60

Fig. 3.25	Non-agricultural trade and the labor income share, by income groups. (Source: The non-agriculture trade volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	61
Fig. 3.26	Non-agricultural import and the labor income share: full sample of countries. (Source: The non-agriculture import volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	62
Fig. 3.27	Non-agricultural import and the labor income share, by income groups. (Source: The non-agriculture import volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	63
Fig. 3.28	Non-agricultural export and the labor income share: full sample of countries. (Source: The non-agriculture export volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	64
Fig. 3.29	Non-agricultural export and the labor income share, by income groups. (Source: The non-agriculture export volume figures come from Tombe (2015). The GDP and labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	65
Fig. 3.30	Employment share of agriculture and the labor income share: full sample of countries. (Source: The employment share in agriculture figures come from Gollin et al. (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	66
Fig. 3.31	Employment share agriculture and the labor income share, by income groups. (Source: The employment share in agriculture figures come from Gollin et al. (2014). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	67
Fig. 3.32	Value-added share of agriculture and the labor income share: full sample of countries. (Source: The value-added share in agriculture figures Lagakos and Waugh (2013). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	69

Fig. 3.33	Value-added share of agriculture and the labor income share, by income groups (Source: The value-added share in agriculture figures Lagakos and Waugh (2013). The labor income share figures are taken from calculations by Karabarbounis and Neiman (2014) using UN and OECD data)	70
Fig. 4.1	Labor income share (broad sectors) across regions. (Source: Authors' own calculations)	85
Fig. 4.2	Sectoral labor income share: The People's Republic of China. (Source: Authors' own calculations)	89
Fig. 4.3	Sectoral labor income share: Brazil. (Source: Authors' own calculations)	90
Fig. 4.4	Sectoral labor income share: Egypt. (Source: Authors' own calculations)	91
Fig. 4.5	Sectoral labor income share: Botswana. (Source: Authors' own calculations)	92
Fig. 4.6	Average sectoral labor income share for 16 developed countries, 1970–2007. (Source: Authors' elaboration based on Alvarez-Cuadrado et al. (2015); original data source: <a href="http://www.euklems.net">http://www.euklems.net</a> )	93
Fig. 4.7	Changes in labor income shares: manufacturing versus services, 1970–2007. (Source: Authors' elaboration based on Alvarez-Cuadrado et al. (2015); original data source: <a href="http://www.euklems.net">http://www.euklems.net</a> )	94
Fig. 4.8	Changes in labor income shares: manufacturing versus services (newly constructed data). (Source: Authors' own calculations. Note: In our sample, the data coverage varies considerably across countries; as a result, the average changes are based on the starting year and the ending year for each country)	95
Fig. 5.1	LIS1 distribution and comparison by income group and region	157
Fig. 5.2	LIS1 by firm size	158
Fig. 5.3	LIS1 by ownership type	159
Fig. 5.4	LIS2 distribution and comparison by income group and regions	160
Fig. 5.5	LIS2 by firm size	161
Fig. 5.6	LIS2 by ownership type	162
Fig. 5.7	LIS3 distribution and comparison by income group and regions	163
Fig. 5.8	LIS3 by firm size	164
Fig. 5.9	LIS2 by ownership type	165
Fig. 5.10	LIS3 distribution and comparison by income group and regions (service)	166

Fig. 5.11	LIS3 by firm size (service)	167
Fig. 5.12	LIS3 by ownership type (service)	168
Fig. 5.13	Comparison of LIS estimates	169
Fig. 5.14	Time series trends for Latin America and the Caribbean	171
Fig. 6.1	The share-capital (SK) curve	179
Fig. 6.2	A feasible range of weights for $\sigma_{Agg} < 1$ . (Source: Authors. Note: This graph shows a numerical example. It shows the feasible range of value for an equation showing inequality)	187
Fig. 7.1	Factor income shares in the United States, 1977–2005. (Note: Authors' calculation based on a combined data set using data sets from Karabarbounis and Neiman (2014) and Buera et al. (2015))	194
Fig. 7.2	Actual versus calibrated value added by industrial sectors. (Note: The solid black lines measure the actual value-added figures. The solid-blue lines, dashed-blue lines, and -brown lines show calibrated value-added figures using CES model, VES model, and VES-W model. The Kormogorov-Smirnov test for goodness of fit suggests that the distribution of actual output level is similar to the calibrated output figures from the CES and the VES-W models. Source: Author's calculation based on the Regional-level Japanese Industrial Productivity (R-JIP) database <a href="https://www.rieti.go.jp/en/database/R-JIP2017/index.html#09">https://www.rieti.go.jp/en/database/R-JIP2017/index.html#09</a> )	198
Fig. 7.3	Trade liberalization and labor income share in East Asia and Pacific. (Note: The period for each country is 1970–1974 (Australia); 1970–1971, 1973 (Malaysia); 1983–1996 (New Zealand); 1992–1998 (Philippines); and 1970–1978 (Republic of Korea))	206
Fig. 7.4	Trade liberalization and labor income share in Europe and Central Asia (I). (Note: The period for each country is 1992, 1996–2005 (Armenia); 1995–2005 (Azerbaijan); 1995–2001 (Bulgaria); 1992–2001 (Czech Republic); 1954–1969 (France); and 1998–2006 (Georgia))	207
Fig. 7.5	Trade liberalization and labor income share in Europe and Central Asia (II). (Note: The period for each country is 1995–2000 (Hungary); 1990–2004 (Kyrgyz Republic); 1994–2003 (Latvia); 1995–2003 (Lithuania); 1995–2000 (Poland); and 1995*, 1998–2004 (Republic of Moldova). *denotes a year in which the adjustment method used for calculating labor income share differs from the one applied for the other years)	208

Fig. 7.6	Trade liberalization and labor income share in Europe and Central Asia (III). (Note: The period for each country is 1997–2001 (Serbia); 1993–2001 (Slovakia); 1995–2001 (Slovenia); 1990*–1993*, 1997–2004 (Macedonia); 2000–2006 (Tajikistan); and 1998–1999 (Turkey). *denotes years in which the adjustment method in calculating labor income share differs from the one applied for the other years)	209
Fig. 7.7	Trade liberalization and labor income share in Latin America and the Caribbean (I). (Note: The period for each country is 1993–2001 (Argentina); 1974–1975 (Barbados); 1980–1983, 1985–1986, 1988–1995 (Bolivia); 1992–2001 (Brazil); 1992–1996 (Colombia); and 1981–1996 (Costa Rica))	210
Fig. 7.8	Trade liberalization and labor income share in Latin America and the Caribbean (II). (Note: The period for each country is 1991–1996 (Dominican Republic); 1986–1991 (Ecuador); 2000–2001 (Honduras); 1984–1988, 1998–1999 (Jamaica); 2003–2006 (Mexico); and 1996–2006 (Panama))	211
Fig. 7.9	Trade liberalization and labor income share in Latin America and the Caribbean (III). (Note: The period for each country is 1994–1998 (Paraguay); 1986, 1988–2001 (Peru); 1987–2002 (Trinidad and Tobago); 1997–2000 (Uruguay); and 1997–2006 (Venezuela))	212
Fig. 7.10	Trade liberalization and labor income share in MENA and South Asia. (Note: The period for each country is 1996–2005 (Egypt); 1995 (Israel); 1970–1973, 1975 (Jordan); 1992–1999 (Tunisia); and 1986–2001 (Sri Lanka))	213
Fig. 7.11	Trade liberalization and labor income share in sub-Saharan Africa (I). (Note: The period for each country is 1994–1999 (Benin); 1999–2008 (Burkina Faso); 2005–2009 (Burundi); 1990, 1993–1996 (Cameroon); 1989–2000 (Ivory Coast); and 2001, 2005 (Mauritania))	214
Fig. 7.12	Trade liberalization and labor income share in sub-Saharan Africa (II). (Note: The period for each country is 1996–2003 (Mozambique); 1995–2004 (Niger); 2001–2011 (Sierra Leone); 1986 and 1988–2001 (South Africa); and 1994–2005 (Tanzania))	215
Fig. 7.13	Sectoral labor income share (broad categories) and trade share of GDP. (Source: Authors' own calculations)	216
Fig. 7.14	Changes in sectoral labor income share and trade share of GDP. (Source: Authors' own calculations)	217
Fig. 7.15	Changes in sectoral labor income share and trade share of GDP: selected countries. (Source: Authors' own calculations)	218

Fig. 7.16	Average sectoral labor income share for 16 developed countries, 1970–2007. (Source: Authors’ elaborations based on Alvarez-Cuadrado et al. (2015); original data source: <a href="http://www.euklems.net">http://www.euklems.net</a> )	220
Fig. 7.17	Changes in labor income shares: manufacturing versus services, 1970–2007. (Source: Authors’ elaborations based on Alvarez-Cuadrado et al. (2015); original data source: <a href="http://www.euklems.net">http://www.euklems.net</a> )	221
Fig. 7.18	Changes in sectoral labor income shares: Japan versus the United States. (Source: Authors’ elaborations on Ameco data)	222
Fig. 7.19	Sectoral labor income share trends for high-skilled workers, 1970–2005. (Source: Authors’ calculation based on data compiled by Buera et al. (2015). Original data source is EU KLEMS. Note: EU KLEMS data cover the following countries: Australia, Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Spain, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, the Republic of Korea, Lithuania, Latvia, Luxembourg, Malta, the Netherlands, Poland, Portugal, the Slovak Republic, Slovenia, Sweden, the United Kingdom, and the United States)	224
Fig. 7.20	Sectoral labor income and employment share in Japan, 1970–2010. (Note: Authors’ calculation based on the Japan Industrial Productivity (JIP) database, <a href="https://www.rieti.go.jp/en/database/JIP2015/#01">https://www.rieti.go.jp/en/database/JIP2015/#01</a> , and Regional-level Japan Industrial Productivity (R-JIP) database, <a href="http://www.rieti.go.jp/en/database/r-jip.html">http://www.rieti.go.jp/en/database/r-jip.html</a> . The latter data set consists of 23 sectors. We divide them into six broad categories)	236
Fig. 7.21	Labor income and employment share in some fast-growing sectors. (Note: Authors’ calculation based on the Japan Industrial Productivity (JIP) database, <a href="https://www.rieti.go.jp/en/database/JIP2015/#01">https://www.rieti.go.jp/en/database/JIP2015/#01</a> )	236
Fig. 7.22	Part-time and female employment shares in some fast-growing sectors. (Note: Authors’ calculation based on the Japan Industrial Productivity (JIP) database, <a href="https://www.rieti.go.jp/en/database/JIP2015/#01">https://www.rieti.go.jp/en/database/JIP2015/#01</a> )	237
Fig. 7.23	Labor income and employment share for some shrinking sectors. (Note: Authors’ calculation based on the Japan Industrial Productivity (JIP) database, <a href="https://www.rieti.go.jp/en/database/JIP2015/#01">https://www.rieti.go.jp/en/database/JIP2015/#01</a> )	238

Fig. 7.24	Shift-share decomposition outcomes. (Authors' calculation based on the Regional-level Japan Industrial Productivity (R-JIP) database, <a href="http://www.rieti.go.jp/en/database/r-jip.html">http://www.rieti.go.jp/en/database/r-jip.html</a> . Note: The R-JIP data set consists of 23 sectors (1 = agriculture, 2 = mining, 3 = food, 4 = textiles, 5 = pulp, 6 = chemicals, 7 = petroleum, 8 = nonmetallic minerals, 9 = primary metals, 10 = fabricated metals, 11 = machinery, 12 = electrical machinery, 13 = transport equipment, 14 = precision instruments, 15 = other manufacturing, 16 = construction, 17 = utilities (electricity, gas, and water supply), 18 = wholesale and retail trade, 19 = finance and insurance, 20 = real estate, 21 = transport and communication, 22 = private services, and 23 = government services))	239
Fig. 8.1	Income distribution (Lorenz curve) in a two-class economy. (Note: Adapted from Atkinson and Bourguignon (2000))	252
Fig. 8.2	Changes in labor income shares: manufacturing versus services. (Source: Oishi and Paul (2018). Note: Change in the labor income share is based on the starting year and the ending year for each country. For further details please see Oishi and Paul (2018))	260
Fig. 8.3	Labor income share and the ownership structure of the firm. (Source: The authors, following Zhou (2016). The enterprise survey data <a href="http://www.enterprisesurveys.org/data/">http://www.enterprisesurveys.org/data/</a> could be an effective tool to conduct empirical studies on labor income share by comparing firms of different ownership types, as well as for using information about the size and the age of the firm across countries)	262

# LIST OF TABLES

Table 2.1	Correlation between adjusted and unadjusted LIS figures	27
Table 3.1	Estimation approaches	32
Table 3.2	Overview of labor share measures for low- and middle-income countries since 1990	34
Table 4.1	Data coverage by region, country, and year	75
Table 4.2	Data coverage by region, country, and 10 sectors	77
Table 4.3	Summary statistics of the sectoral labor income share (unweighted)	84
Table 4.4	Labor income share (broad sectors) across countries	87
Table 4.5	Changes in labor income shares (broad sectors)	94
Table 5.1	Country composition table from World Bank Enterprise Survey data	146
Table 5.2	Labor income share by income group and regions	155
Table 5.3	Labor income share by firm size and ownership	156
Table 6.1	MES for two different nested-CES production functions with three inputs	185
Table 7.1	The MES and the comparative statics outcomes	195
Table 7.2	Comparison of the estimated elasticity of substitution parameters	196
Table 7.3	Overview of labor share measures for low- and middle-income countries since 1990	204
Table 7.4	Summary statistics (unweighted)	226
Table 7.5.	Baseline models (broad sectors) of the labor income share	228
Table 7.6	Baseline models (disaggregated sectors) of the labor income share	229
Table 7.7	Alternative specification: service trade as a share of GDP	230

Table 7.8	Channels of change in labor income share (baseline model specification)	232
Table 7.9	Channels of change in labor income share (alternative specification)	233
Table 8.1	Evolution of monthly wages (% change between 1990 and 2000)	256



## CHAPTER 1

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# Introduction

The functional distribution of income (factor income shares) has long 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 share of labor income has been seen to be constant. Keynes (1939) described this constancy as "the most surprising, yet best-established fact," whereas Kaldor (1956) advocated the constancy of the labor income share (LIS) as "the stylized fact" of long-term economic growth. Despite its long pedigree, the academic interest in factor income shares has had a rollercoaster ride. As Atkinson (2009) wrote "Since the 1960s, factors shares have been downplayed. The textbooks no longer give them much space." Recent years saw a comeback with a large volume of studies documenting a global decline in the labor income share. Growing concern over this trend has encouraged debate about fair distribution of personal incomes. The topic of income distribution is once again at the center of economic debates, and this book joins this discussion in a timely fashion.

The study of factor income shares plays an important role in understanding the relationship between national income and personal income and their links to overall income inequality. The global share of income going to labor is declining, coupled with the fact that a disproportionate share of this decline is found among low- and middle-skilled workers. The labor income share has been increasing for high-skilled workers and

declining for middle- and low-skilled workers worldwide. Several factors contribute to this secular trend. Growing skill premium, as an outcome of globalization, and an increasing complementarity between capital and skill through the advancement of technology could explain the polarization of labor income shares across the skill spectrum. If capital can be substituted with unskilled labor more readily than with skilled labor, a drop in the relative price of capital would result in a larger drop in the employment of unskilled workers compared to skilled workers. This could then lead to a decline in the share of income for unskilled labor more so than for skilled labor. Higher exposure to routinization of tasks (i.e., the automation of tasks where labor can be substituted by capital to the highest degree) has also played a key role in the polarization of wages and skill premium along the skill spectrum.

The aim of this book is threefold. First, it provides novel insights on the measurement of the labor income share. Second, it amasses recent developments in the theoretical and empirical research on the labor income share to gain a deeper insight into the drivers of the labor income share. And finally, using novel datasets it provides empirical evidence on the correlates of the labor income share at the firm, sector, and country level. Chapter 2 contains a discussion on the measurement issues and the conceptual problems related to the labor income share. Chapters 3, 4, and 5 describe trends of the labor income share at the country, sector, and firm level, respectively. Chapter 6 relates to theoretical discussions, while Chap. 7 provides empirical evidence on the drivers of the labor income share both at the country and at the sector level. Chapter 8 outlines potential areas of future research and concluding remarks are forwarded in Chap. 9.

This book contributes to the issues related to the measurement of the labor income share. The difficulties associated with the measurement of labor income share increase in the presence of self-employment, which constitutes almost half of the global workforce with their labor income being inaccurately measured. Chapter 2 discusses an extension of the adjustment framework for self-employment suggested by Gollin (2002) to a more disaggregated sector level. Allowing for self-employment rate to vary across sectors, it considers an adjustment factor composed of (1) the earnings ratio of self-employment to wage-employment and (2) the employment ratio of self-employed to wage employees. The agriculture sector shows the least correlation between the adjusted and unadjusted LIS figures suggesting that agriculture sector is a greater source of the self-employment error compared to other sectors.

Secondly, this book amasses cross-country evidence on the evolution of labor income shares at the country, sector, and the firm level. It provides a unique opportunity to compare the labor income share measures at three different levels. At the sector level (following the Groningen 10-sector classification), it puts together a dataset for a sample of 54 countries. At the firm level, I construct a dataset using the World Bank enterprise survey data for 139 countries. And, at the country level, data is compiled from the existing sources for a sample of 98 countries. Evidence at the micro level suggests that while the labor income share has decreased for low-skilled workers, this has been concurrent with an increase for high-skilled workers. Globalization leading to a growing skill premium and an increasing complementarity between capital and skill through the advancement of technology also explains the polarization of labor income shares across the skill spectrum.

Finally, this book provides novel insights into theoretical research on the labor income share. Chapter 6 forwards a theoretical framework based on the Morishima elasticity of substitution to validate the capital accumulation mechanism as a driver of the labor income share. The role of capital accumulation as a driver of declining labor income share requires capital and labor to be substitutes, which appears paradoxical in a world predominantly characterized by complementarity between capital and labor. In a nested-Constant Elasticity of Substitution (CES) framework with capital-skill, the Morishima elasticity of substitution identifies the elasticity parameters at different skill levels, and based on its properties, I derive the condition that allows capital accumulation to coexist with a declining LIS when capital and labor are complements. It refines our understanding of the global decline in LIS by highlighting the significance of the skill composition of the labor market. The relevance of capital-skill complementarity for the labor share of income can also be drawn using a two-stage production structure (Goldin and Katz 1998). In the first stage, skilled workers adopt new technologies and efficiently use capital, thus showing high capital-skill complementarity. In the second stage, unskilled workers continue the mechanical process of machine maintenance indicating a relatively low level of capital-skill complementarity. Such practices are common across both developing and developed countries and provide an important link between capital-skill substitutability and factor income shares.

I hope this book proves to be useful for academics, policymakers from government agencies, policy aides in research institutions and think tanks, and broader audiences from public and private organizations. The aim of

this book is to provide technical and practical insights and help design policies to reduce inequality. I briefly discuss below the contribution that each chapter makes in this book.

Chapter 2 provides an overview of the conceptual issues in the measurement of the labor income share. It first discusses various definitions proposed to measure the labor income share and then highlights the sources of the measurement problems. The national accounting statistics do not provide accurate data for labor income as it involves both incomes earned by wage employees and income earned by self-employed. In addition, 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. It then extends the adjustment framework for self-employment suggested by Gollin (2002) to a more disaggregated sector level, by allowing self-employment rate to vary across sectors. The novel adjustment factor at the sector level is composed of the earnings ratio of self-employment to wage-employment and the employment ratio of self-employed to wage employees. The empirical evidence confirms that agriculture sector is a greater source of the self-employment error compared to the rest of the sectors.

Chapter 3 combines macro data from various sources including the Penn World Table (PWT) and the United Nations Industrial Development Organization (UNIDO) and showcases correlates of the labor income share for a sample of 93 countries. There is a positive correlation between the GDP per capita and the average labor income share, whereas there is a weak negative correlation between the informal sector share of GDP and average labor income share. Correlation between self-employment and average labor income share shows a similar negative relationship, but with a strong goodness of fit and clear regional patterns among the upper and lower middle-income countries. Trade measures are positively correlated with the labor income share, and the goodness of fit is higher for the upper middle-income countries relative to countries from other income groups. There is also a positive correlation between the non-agricultural export volume and the average labor income share.

Chapter 4 discusses the labor income share at the sectoral level for 53 countries. Of the 53 countries, 20 are developing countries (based on the World Bank classification), and, for a sample of 45 countries, data are available for at least five years. There is considerable variation in the labor income share estimates within each region and within each broad category of sectors both at the level and with changes over time. Overall, there is a

fall in the average rate of change in the labor income share in the secondary sector and the primary sector and a rise in the same in the tertiary sector.

Chapter 5 provides some evidences on the drivers of the labor income share at the firm level using a novel firm-level dataset on the labor income share. It defines the firm-level labor income share following three alternative approaches and compares these estimates across income groups, regions, firm sizes, and ownership types. The estimates average around 0.45, with considerable variations across regions and firm characteristics. Manufacturing firms tend to have a lower labor income share as the firm size increases. Large firms in services, both foreign and state-owned, pay a higher share of income to laborers.

Chapter 6 advances a theoretical discussion on the role of elasticity of substitution and complementarity between factor inputs and skill as drivers of the labor income share. It begins with a production function to establish a relationship between production technology, factor productivity, and factor income shares. The assumption of a non-unitary elasticity of substitution ( $\sigma$ ) between capital and labor plays a crucial role in the movement of the labor income share. The role of elasticity of substitution is discussed considering a homogeneous labor market (a production function with capital and labor) and a heterogeneous labor market (a production function with capital, skilled labor, and unskilled labor). The theoretical model is then extended to analyze the comparative statics outcomes on the labor income share.

Chapter 7 discusses empirical findings on the drivers of labor income share under three broad categories: (a) technological change and capital intensity, (b) structural transformation, and (c) institutional changes. As the burgeoning literature shows, there could be numerous channels at work within these broad categories. For example, the declining rate of unionization falls under the broad category of institutional change, and it leads to a decline in labor's bargaining power and consequently to a decline in the labor income share. However, the process of globalization or the participation of a country into the global value chain could cause a decline in the unionization rate. Moreover, the participation of global value chain is allowed by the reduction in shipping or communication cost through the technological change. At the same time, the reduction of corporate income tax rate can also be categorized under institutional change and globalization if it is implemented because of international pressure or is driven by capital mobility across nations.

Chapter 8 highlights several potential areas of research on the drivers of labor income share (LIS). These include personal income inequality, skilled emigration, remittances, and brain-gain, remittances, and negative labor supply, premature deindustrialization, firm restructuring, and globalization at the sectoral level.

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## CHAPTER 2

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# Definition, Measurement, and Conceptual Issues

The traditional labor income share measures the degree to which income can be attributed to labor in terms of capital, labor, and production. However, only using these factors to express the labor income share gives a limited account for other relevant factors such as the high informal sector, mixed income sector, or taxes on capital and labor incomes. This measure also has conceptual issues in matters such as whether a gross or net measure best accounts for the labor income share, or determining the causes for the labor income share to shift with various arguments debating factors such as competition decline, rising information technology, intellectual property products, capital accumulation, and globalization. This chapter focuses on both discussions, first in showing the range of definitions proposed to better measure the labor income share and then by highlighting the conceptual issues in the literature related to further understanding the measure.

### 2.1 DEFINITION OF LABOR INCOME SHARE

A number of definitions of labor income share (LIS) have been introduced, starting with the traditional understanding of labor income share described by Lübker (2007) to be “how much of national income accrues to labor.” This has been utilized by the Bureau of Labor Statistics (BLS) in their equation to denote the labor income share which is the form

popularized through much of the literature. This is shown below for year  $t$  and sector  $k$ :

$$LIS \equiv \frac{\text{Labor income}_{ik}}{\text{National income}_{ik}}$$

In examining the components of the factors in this equation, the BLS reports several series which all have a similar methodology. For the non-farm business sector, they determine labor compensation (labor income) sector as compensation of employees excluding government wages and salaries, compensation of employees of nonprofit institutions, private compensation, farm compensation of employees, but including imputed labor compensation of self-employment (Gomme and Rupert 2004). The “value added” measure conforms to these same sectors. However, this lacks coverage of information such as intangible inputs, the attribution of mixed income, non-private, and informal sectors. Consequently, the BLS definition is inappropriate for many applications, such as to find the labor income share in developing countries where attention to self-employed income is vital. This has also given way to widespread debates concerning the high level of ambiguity of proprietor’s income and indirect taxes less subsidies. For the issue with ambiguity of proprietor’s income, this is addressed by the Bureau of Labor Statistics by computing an implicit wage for the sector through dividing compensation by hours worked. In assuming that the self-employed will pay themselves the same wage that they could otherwise earn in this sector, their implied labor income is this implicit wage multiplied by hours of work by the self-employed.

Gollin (2002) recognizes the importance of accurately accounting for the self-employment income and proposes three adjustment approaches for the labor income share equation, which use mixed income and the employment structure of a country in their estimation of the labor income share. He argues that income shares are approximately constant across countries when using these adjustments (ibid., p. 459). He then explains how employee compensation shares are a poor measure of labor income share, since their disparities may reflect changes in the sectoral composition of output or in the structure of employment, exclude important forms of non-wage compensation, and include rents accruing to particular skills such as returns to entrepreneurial ability (ibid., p. 463). This leads to a large understatement of labor income share in countries where self-employment is a significant proportion of the workforce. He proposes that